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THE WORLD FOR A CORAL:
FORTUNE AND BELONGING ON THE REEFS OF SOUTHEAST SULAWESI

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ABSTRACT

The World for a Coral: Fortune and Belonging on the Reefs of Southeast Sulawesi

Joseph R. Klein

The World for a Coral tells the story of divers who scour the reefs of Southeast Sulawesi, Indonesia, for beautiful and increasingly rare live corals for the global aquarium industry. Working on small wooden boats and breathing from makeshift air compressors, divers gather corals from reefs near the provincial capital city, Kendari, destined for saltwater aquariums around the world.

For years coral collecting brought prosperity to divers and their communities—a blessing of good fortune, or *rejeki*. But as Indonesia's coral reefs continue to decline, divers have been pushed to intensify their efforts—sailing farther, diving deeper, and searching longer—working harder under more dangerous conditions for the same or diminishing returns. Then, in 2018, a power struggle within the government brought the trade to a sudden halt, as key permits needed to turn corals into state approved commodities were withheld. With their livelihood on pause, how would the divers get by?

Drawing on 23 months of ethnographic research, I show how coral collectors navigate both environmental change and a shifting political economy. I argue that as ecological processes—the "work" of nature—are increasingly undermined, and as the political winds shift, people are forced to get creative, taking up what I call "experiments in fortune." These include experimenting with novel commodities and new markets, seeking credit and capital in unlikely places, devising creative ways to skirt the authorities or drum up permission—even recycling waste from industrial nickel mining to generate new plots of reclaimed land. But it also means trialing forms of intensification involving increased inputs of labor, time, and money, and which bring heightened bodily and financial risk, like

fishing with fertilizer bombs or diving on unreliable compressors. As they work, coastal communities navigate what I call "economies of permission," engaging official forms of state authority, everyday vernacular institutions, customary rules governing access, and the permission of sea guardian spirits who protect the reefs.

As they piece together a livelihood at a time of environmental loss and political economic change, I show how coral divers and coastal communities reimagine belonging, ownership, labor, and the promise of fortune.

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Map 1: Kendari and Moramo Bay. Nambowatu sits on the west shore of the Tanjung Peropa peninsula.

INTRODUCTION

The World for a Coral

The World for a Coral tells the story of divers who scour the reefs of Southeast Sulawesi, Indonesia, for beautiful and increasingly rare live corals for the global aquarium industry. While most corals sell for the equivalent of a few dollars at best and turn a profit only in bulk, a single specimen of the rarest and most valuable, like the "rainbow donut" or the "balloon mushroom," can be sold for life-changing amounts of money. But as the region's coral reefs decline, the hunt becomes more difficult. Coral collectors are pushed to intensify their efforts—sailing farther, diving deeper, and searching longer—working harder under more dangerous conditions for the same or diminishing returns.

I had gotten to know the lives of coral divers by going with them to sea, especially aboard a small diving boat called the *Two Sons*, owned and captained by Imran, my friend and main interlocutor.[1] The *Two Sons* plied the waters between the provincial capital of Kendari and a small coastal village that I call Nambowatu—home to dozens of the world's most skillful coral collectors. These waters were full of reefs, and the reefs were full of beautiful corals; wealth from coral had helped build the village and brought good fortune to its residents.

But in May 2018, in the middle of my research, the live coral trade came to a sudden, grinding halt. A power struggle within the government had thrown a wrench into the machine of legal procedure that helped turn colonies of coral into state-approved commodities. Like all forms of world-crossing trade, the coral industry was vulnerable to many diverse claims of authority with the power to fulfill or frustrate its ambitions, and it would be two years before the machine would come un-stuck. How would the divers and their communities, who had come to depend on this globe-crossing supply chain, get by?

This dissertation is an ethnography of economic creativity along a changing coastline. It follows coral divers and their communities as they work to piece together a livelihood, and explores the ways that people engage with and reimagine ideas of fortune, ownership, and belonging at a time of environmental loss and political economic change. In many ways it is a story of getting by in the Anthropocene; creatively making ends meet, finding ways to put the pieces back together when things keep falling apart.

Increasingly we live in a world where economic ingenuity and creativity—finding clever ways to get by—are becoming compulsory. When the natural processes on which you once depended—like the generativity of a coral reef or migrations of schooling fish—begin to disappear, what do you do? And when the political economy turns against you, withdrawing the forms of permission required to make a living, how do you cope?

For many there is no choice but to innovate, intensify, involute, and experiment—to come up with ever more clever ways to cash in—even at your own peril. You dive deeper. You try out new technology. You search for credit in new places. You experiment with new commodities and new markets. And you forge new social connections. In a situation where you are compelled to produce, you make creative use of whatever strategies, resources, and cultural forms are available.

I explore how coral collectors and their coastal communities navigate these shifting tides of fortune—and document their strategies and attempts to make ends meet. These include turning to different forms of creative intensification or involution: increasing inputs of labor and time, increased demands for capital, increasingly bizarre forms of technology like bombs or diving compressors, and increasing assumptions of bodily and financial risk—just to stay afloat. These forms of intensification often hasten the kinds of environmental destruction they were meant to address—as evidenced by fish bomb craters that litter the reefs. But the effects are often more subtle and creeping; even ordinary fishing nets have changed, their mesh size made smaller to keep up with the ever-shrinking

fish. Intensification writes itself into the multispecies landscape and into bodies—human, fish, and coral alike.

I show that in a time of environmental crisis, when the value given for free by the living world is eroding and the political winds are shifting, the compulsion is not simply to produce—but to do so with ever increasing creativity and intensity. And with these processes come changes to the meaning and materiality of economic categories. I show how ecological loss has transformed labor and work, created new economic subjectivities, reconfigured landscapes, and remade the very meaning of luck, prosperity, and "fortune."

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Capitalism expands and reproduces itself by compulsion: when all the things you need to survive are privately owned, you are forced to come up with cash to buy them on the market. In coming up with that cash, you are inevitably pressed into playing the game of commodification yourself. You must either find something to sell, or become the commodity, selling your labor and time (Marx 1976; Wood 2002; Postone 1993; see also Li 2014a). In places like the coasts of Southeast Sulawesi, one old way of getting by has been to find valuable things in the ocean to sell—including corals. But what happens when the ecosystems that produced those valuable things, such as coral reefs, begin to disappear?

These questions become increasingly common and urgent in an era of global environmental crisis and climate change. In the registers of international power and policy, these processes have been called "adaptation," a term most often seen in the wild with its lexical sibling "mitigation" in the context of explaining that because wealthy polluting countries will not even attempt to "mitigate" the impacts of climate change, the rest of the world will have to "adapt" to a new world of ecological and climatic chaos.

There are many ways that people respond or "adapt" to environmental change. In Southeast Sulawesi, I began to notice a pattern that I've come to call "chasing less with more," where more resources, time, money, and energy are deployed in pursuit of shrinking

returns. That is to say, that while economic ingenuity and intensification are often associated with growth or accumulation, they are just as often about dealing with loss—diving deeper when the shallows are depleted.

Chasing less with more occurs when people work to compensate for something that has gone missing. It is about augmentation, gap-closing, substitution, and replacement. It is about finding workarounds to make up for the loss of ecosystem functioning, for instance, or extending the human body beyond what was thought possible or safe to reach the very last pockets of a resource: like marine product collectors risking their lives on janky diving compressors to chase the last few beautiful corals. In many cases, these forms of extraction create the very conditions of degradation that give rise to the need to intensify in the first place. This kind of intensification can appear like the ouroboros—its own cause; a kind of self-devouring growth (Livingston 2020).

We might think of this in simple terms as "closing the gap": ecological loss, decline, or disappearance creates a gap; intensification or creativity fills that gap, at least temporarily. The loss of shallow reefs, for instance, creates a gap between diver and coral. That gap is bridged by the diving compressor, as a form of intensification, allowing divers to go much deeper. Likewise, the loss of herbivorous species creates a gap in ecological functioning; to keep your coral farm from being overgrown by weeds, you need to replace the labor of the lost algae-cleaning fish in the form of humans with plastic scrub brushes. This structural dynamic—needing to find ways to make up for ecological loss—is here to stay. It is impossible to understand economic change in the Anthropocene without it.

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Central to my account are what I call "economies of permission." As they search, divers negotiate many shifting, overlapping, and uncertain forms of authority—coral bosses, fisheries regulators, invisible sea guardians, vernacular customary institutions, and rogue cops, among others—each of whom has the power to grant or withhold critical forms of

permission needed to turn a coral into cash. Tracing these economies of permission raises many thorny questions: Can a village control its own waters? Can it forbid others from fishing or diving? More importantly, who can *grant* permission? Who owns the sea? Who owns the reefs? To whom does the sea belong, and who belongs to it?

Permission is a particular manifestation and enactment of power-as-control; it is power demonstrating and reproducing itself through the performance of either granting or withholding permission. Whoever is recognized as being able to grant or withhold permission—whoever you need to ask—is recognized as having power. Those who are well connected are able to conjure up forms of state-sponsored permission to legitimate their own production and extraction—environmental consequences be damned. Those who are not well connected are left to navigate these shifting political economies as best they can.

Questions of permission, property, belonging, and authority were not ones that I brought with me to this project at its start—only in the analysis did it occur to me that I had assembled a strange catalogue of stories about the circulation of different, overlapping forms of permission and the performances of authority that underpinned them. State regulation jostles with vernacular and indigenous institutions of access and permission, which jostle with conservation ideas of permission and restriction, which jostle with discourses of restoration and regrowth. These questions of the performance of power, its multiplicity of forms, and the insurgent, sometimes playful ways it is engaged and remade also address regional concerns, especially Indonesian cultural politics (Tsing 1993, Pemberton 1994), and questions of the fracturing of authority after the fall of the New Order (Hadiz 2010; Rutherford 2003).

I found that for divers and their communities, navigating these shifting economies of permission was among the most concerning and challenging aspects of closing the gaps created by environmental loss, and it engendered enormous creativity—whole bodies of strategy for dealing with cops, for example. On the flip side, economies of permission are

also what allowed actors like nickel mines to garner the forms of permission that would allow them to continue destroying the province. And for state agencies like the fisheries ministry, strategically situating themselves as a key bottleneck of permission became an effective way to increase their ministry's power.

State sponsored permission is literally figured in the pieces of paper we call "permits." These permits are not symbolic of permission or state backing—they *are* the permission. They are the glue that shows us the melding of state function and personal enrichment. They take many forms: Coral collecting permits, permits to reclaim land, titles and deeds to one's home and land, and countless others. By attending closely to the permits themselves—who holds them? Who can get them? Who cannot get them? How do they get them?—we can start to understand how economies of permission shape the contours of everyday life.

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People in Nambowatu describe economic life in terms of seeking one's fortune, or rejeki in Indonesian; I likewise use "fortune" as an analytic category for thinking about livelihood and economic life. Each day divers go to sea to "search" for rejeki, knowing that if they're not ready to receive it, it could pass them by. Rejeki is a mode of explanation that blends familiar economizing tropes of cost-benefit, risk, and profit margins with the agencies of spirits and the indeterminacies of fate. It is a project of collaboration between humans and more-than-human worlds and landscapes that include not only the kinds of reef ecologies known to biologists, but also spirits, ancestors, fate, and the will of God. But these are not timeless, unchanging cultural features; fortune and the spirits respond to the same political economic forces that shape the world we all inhabit. In this way, you never know how your fortune will arrive—as a net full of fish, a well-timed fluctuation in commodity prices, or as a homemade fertilizer bomb.

Figure 1: The *Two Sons*

Indeed, among the most important kinds of permission and authority that must be negotiated by divers in pursuit of fortune are those granted by invisible sea guardians who inhabit the reefs and protect the corals. Just as you must ask permission before harvesting mangoes from your neighbor's tree, so must you request permission from the spirits of the reef before gathering corals. And so, each time he dived, Imran would say a prayer in his heart asking for permission from the guardians of that particular reef to dive there and gather coral. "We are just like you—we're the same, just here searching for our fortune." This request, this prayer, interpolates the spirits as themselves pursuing their own fortune, and is central to the successful realization of corals as exchange value. Failure to show deference and obtain permission before taking something from the reef can lead to deadly accidents and misfortune—and even with permission, you still must show discretion and restraint when collecting.

Economic anthropology always confronts the problem of what counts as "economic" (Yanagisako 2002). Ideas of "fortune" or "rejeki" are helpful here—they mess up the clean secular lines of the "economic" to show the entanglements required to produce livelihoods and value (Chakrabarty 2000).[2] Fortune includes all of the things conventionally considered "economic" (labor, money, commodities, etc.)—but does not stop there. Kinship, gender, ethnicity, God, the weather, spirits, community ecology—all of this and more matters in the production of fortune. The point here is not to contrast "rejeki" with secular-rational notions of "the economic," but rather the opposite: to show that economic life *is always* constituted by entanglements that exceed and defy secular order (see also Bear et al. 2015). Even things we thought we understood—value, exchange, labor, debt—turn out to be underwritten by parts of the story that "fall away" from analysis (Tadiar 2009; Rofel and Yanagisako 2018).

In telling these stories of rejeki, my goal is to experiment with writing in ways that "make space" for capacious notions of what counts in economic life (Mittermeier 2021: 28)—like the crucial role played by sea guardians in cycles of coral commodification. This analytic approach requires an openness to the indeterminacy of a world that we recognize as always still in the making (Nadasdy 2021), and to a plurality of circuits of value and fortune that might stretch the limits of analytic categories (e.g. Povinelli 1995). Put differently, it might require us to abandon what Mayanthi Fernando (Fernando and Harding 2020) has called "the quest for certainty," and instead to take up writing practices that allow glimpses of the "breach" in the authority of academic practice by worlds that exceed the bounds of secular rationality and/or the limits of our own experience (Chakrabarty 2000: 96; see also Fernando 2017, Nadasdy 2007), and to honor ways of knowing the living world too rich for the secular academy to swallow (Todd 2016).

The important thing is recognizing the limits of your own ability to know—a stance of epistemic humility that Imran modeled in his ritual of permission. Indeed, Imran

explained, you could never be sure in advance which corals and which reefs belonged to the spirits, and the spirits themselves were indeterminate beings that refused to be fully seen or known. Asking permission is therefore an act of recognizing the limits of your own knowledge and authority—that there may be more going on than you realize. I tried to practice this stance, and at Imran's suggestion, I began to offer my own silent acknowledgement and request for permission before diving. I may not have been taking fish or coral or sea cucumbers, but I was certainly gathering knowledge and experience that I would take with me to send out in the world in pursuit of my own kind of fortune—as I am now doing.

The Work of Nature: Loss and Replacement

I will never forget hearing a radio story years ago about an apple orchard in Sichuan, which, suffering from a mysterious disappearance of local bees in the middle of the spring blooming period, issued tiny paintbrushes made of chicken feathers to a phalanx of workers who carried ladders from tree-to-tree, hand pollinating the delicate blossoms.[3] A previously unexamined step in apple production, outsourced to nature, was suddenly internalized. Professional Economists arrived to investigate: it was not all bad, they argued; after all, the vacancy of the bees had created new jobs for humans. And when they measured, they were shocked to find that apple production had *increased*. Were the humans actually *better* than the bees? Only later was it realized that bee populations had been declining for many years, slowly killed off by the adoption of industrial pesticides; the change had been so gradual that nobody noticed until the whole thing collapsed. It took a complicated, clumsy, and expensive assemblage of human-ladder-paintbrush to replace the gift that the bees previously gave for free as they pursued their own fortune by stuffing their sacs with pollen.

This "Parable of the Bees" (Gowdy et al. 2013) repeats an old, well-known truth: that all value comes from the living world. Humans, as part of that living world, benefit from the productivity of the earth and rely on its systems and cycles to sustain life and

livelihood. Anna Tsing (2015) has shown how capitalism always relies on the appropriation of cycles and processes beyond capitalist control—such as a bee colony's need for pollen, or the shifting of the trade winds. These processes and cycles are enlisted or seized for projects of production and capital accumulation—a process Tsing names "salvage." Salvage is not merely supportive or ancillary to capitalism—it is how capitalism works. This it shares with every other way of organizing production: the subsistence cultivator relies on the power of the sun and the bacterial cycling of nitrogen and the pollination of bees, just as the industrial farmer does. Neoclassical Economists, with their 19th century models of closed, bounded, independent systems, refer to these as "externalities," costs or benefits excreted from the body of the corporation, passed on to someone else. Their model implies that such forms of interconnection are exceptional, rather than the foundation of all circulations of value.

Jason Moore (2015) notes that this has been possible because nature and all the other components of production have been "cheap" for capitalism: capitalism has received both the stuff of production and human labor for free or with very little cost. The tactics of creating cheapness in production are many and violent: cheapness is achieved through the theft of land (e.g. Palmer 2020; Estes 2013), the enslavement of people (Smallwood 2009), the pillage of ecosystems (e.g. Tsing 2005), islands (Teaiwa 2014) or whole continents (e.g. Galleano 1973), the dumping of raw waste (e.g. Voyles 2015)—to name just a few. In all cases these forms of cost reduction are more properly called cost externalization or cost displacement—the cost not eliminated, but simply passed, by force, on to someone else. More simply, we can also call them theft (Nichols 2020).

These insights build from long legacies of feminist, postcolonial, and Black studies scholarship which have worked to center the theft of uncompensated labor in historical analyses of capitalism. Indeed, the history of capitalism is impossible to narrate without centering the legacies and ongoing structures of primitive accumulation that began during

European colonialism and Atlantic slavery—a history of building immense wealth by stealing land and labor by means of violence (Du Bois 1935; Estes 2013, 2019; Smallwood 2009, 2017, 2019; Robinson 1983; Jobson 2021). Likewise, feminist scholars have long shown how capitalism has always depended on uncompensated so-called "reproductive labor"—the work that renews the conditions of capitalist production—in the generation and accumulation of value (e.g. Morgan 2004; Tadiar 2009; Frederici 2004; Weeks 2011; Bear et al. 2015; Wolf 1992). Central here are the gendered and racialized divisions of labor which undergird capitalist production, including feminized and unpaid domestic and care work that enables workers to be clothed, cleaned, rested, and fed for the next day's work; in other words, the labor costs of capitalism were kept cheap (or free) by exploiting this uncompensated labor made available by racial and patriarchal power. These scholars have shown that the orthodox Marxian position that wage labor is the sole creator of value, while enslaved labor and so called "reproductive" labor are merely ancillary, is and has always been untenable (Tadiar 2009; Smallwood 2017)—an analytic artifact of the capitalist impulse to "externalize" costs as part of chasing cheapness. These analyses laid the groundwork for scholars to understand how capitalism likewise appropriates the "work" of the living world in production (Tsing 2015, Moore 2015; Besky and Blanchette 2019).

In short, capitalism (and every other form of economic organization) has always relied upon and taken advantage of processes beyond its control—including the earth-systems processes that animate the living world (Tsing 2015).[4] But what happens when those processes—the "work" of the living world—begin to fall away? When the bees stop coming to the orchards? When the fish stop schooling?

This creates a condition in which the costs of production begin to rise—when human labor or capital is made to step in to replace the lost work of the living world: instead of honeybees, humans on ladders with paintbrushes. Indeed, somewhat ironically, the premise that the living world produces value is only now becoming more widely accepted

in Marxian thought, precisely at the moment that life-sustaining systems are breaking down. In the words of Naisargi Dave (2019: 216), "we know that nature works not because it works, or because of *how* it works, but because it *refuses* to work."[5]

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Moore (2015) has expressed this problem through a reinterpretation of Marx's notion of the tendency of the rate of profit to fall through ecological terms; he offers an analysis of "the tendency of the ecological surplus to fall." That is, high rates of profit for capitalism have historically depended on getting free or cheap materials and "work" from "nature," which has minimized the capital requirements for enterprise. As those forms of natural "work" and materials disappear or decline, they must be replaced by capital—what he calls the "capitalization of nature;" for Moore an industrial cornfield in Iowa provides a good example—as the "natural" productivity of the soils decline, then they must be augmented by chemical inputs to maintain production levels. This drives production costs up, thus reducing the rate of profit, and drives producers to attempt to scale up operations with machinery. Over time as capitalism increasingly exhausts the generative capacity of the living world, costs will continue to increase, and profit rates will continue to decline. Moore articulates these declining contributions by the living world and the subsequent rise in capitalization as "the end of cheap nature." (Moore 2015: 108).[6] This is the arena in which "chasing less with more" emerges: fewer fish chased with greater intensity; more work for less pay.

Take a recent ethnographic example. In his ethnography of aquifer depletion in Kansas, Lucas Bessire (2021) presents a quintessential example of "chasing less with more." When the well runs dry you don't conserve water—you dig a deeper well. The death-drive mentality of extraction to exhaustion creates a spiral: the faster you pump, the faster you need to pump. And the ability to think this way is created by the structure of white settler colonialism and Indigenous dispossession, which demands that settlers maintain particular

affective relationships to the land and the earth as part of their divinely granted dominion. Indeed, as Bessire shows, those tasked with regulating water use are themselves some of the biggest pumpers; unsurprisingly, they grant themselves permission to drain the life from the plains.

Settler depletion of the Ogallala aquifer is possible because white settlers do not have a strong sense of belonging to, nor a sense of responsibility for, place or land (Watts 2013); when the water is gone, the settlers will simply leave. And in the meantime, they dream up bonkers schemes to intensify even further, like piping in diverted river water from hundreds of miles away to cover their deficit.

However, this kind of feedback loop is not the only scenario in which the effect of chasing less with more is generated. In many other cases the decline is produced by "externalities," from other places. Consider the live coral trade. The decline in coral reefs is not primarily due to coral harvesting; it is not the fault of coral collectors that corals are today harder to find. There are simply not enough coral collectors to generate this impact, and their harvesting techniques are too selective to drive widespread decline in this way.[7] Instead, coral fishery decline is driven by a suite of local and global forces that are destroying coral reefs: climate change, coastal development, sedimentation, eutrophication, bomb fishing, and trophic cascades caused by overharvesting of top predator species, among others. And yet, coral divers are nevertheless trapped in the dynamic of chasing less with more, to compensate for decline that they are not responsible for generating.

Trading Coral, Keeping Reefs

I came across this project somewhat by accident. In 2015, I was researching the Indonesian reptile skin industry for a regional non-profit organization (Indonesia is the world's primary supplier of reptile skins for the fashion industry). Part of this work involved comparing real "on the ground" estimates with official trade statistics recorded in an

international trade database. However, as I scrolled through the thousands of entries under the heading "Reptilia," which added up to hundreds of thousands of snakes, lizards, and crocodiles exported each year, I kept noticing that the numbers were far surpassed by a different taxonomic class I was not familiar with: "Anthozoa." One by one, I typed their indecipherable Latin names into a search engine—*Catalaphyllia jardinei*; *Euphyllia ancora; Acanthophyllia deshayesiana*—and my screen filled with a sea of color: these were corals.

The numbers were staggering: the total export figures hovered around a million corals exported from Indonesia each year, and were being shipped to every corner of the globe. More interesting still, while the reptiles were mostly categorized with the marker "SKI" for "skins" or "LEA" for leather," these were all labeled "LIV": alive. Where were these corals going, and where did they come from?

At the time, in late 2015 and 2016, the world was full of chatter about the imminent demise of coral reefs following the onset of the 2014-2017 mass bleaching event that affected more than 70% of the world's coral reefs. Today we know that coral cover in 2015 was less than half of what it was in 1950; it is likely even less today (Eddy et al. 2021). In 2016 *Outside Magazine* even published a satirical obituary for Australia's Great Barrier Reef that began: "The Great Barrier Reef of Australia passed away in 2016 after a long illness. It was 25 million years old."[8] In this context, what did it mean for Indonesia to be exporting millions of its living corals to all corners of the planet? Could we learn something about human relationships with reefs through an ethnographic study of the live coral trade? Would those working inside the supply chain perhaps have valuable perspective and privileged knowledge about the reefs that were obsessing the rest of the world? Chasing the answers to these questions would lead me to unexpected places.

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Corals are animals. Like their Anthozoan cousins the jellyfish and sea anemones, they are composed of polyps—a body plan that basically consists of a mouth ringed by tentacles,

and a stomach cavity. Most corals get by through a combination of feeding on passing marine debris particles (though some corals have big enough mouths to swallow small fish or shrimp) and photosynthesis—a task they outsource to microscopic dinoflagellate algae (called *Symbiodinium)* that live in their tissue and give the corals much of their color.

Like all animals, corals reproduce sexually, ejecting gametes into the water column which combine to form planktonic larvae, which then settle and grow into adult corals. Some mature corals live alone, a single great mouth. Others continuously divide themselves, producing clusters or colonies of cloned polyps living tightly packed side-by-side, confounding our sense of the individual. Some, such as the soft corals, are joined together by webs of fleshy tissue; others, like black corals, produce skeletons made of chitin or other proteins. But in the case of the famous stony corals, the main focus of this dissertation, skeletons are made of calcium carbonate—the same material used by oysters to lay down their shells, and the same mineral that produces most limestone. As they grow and divide, the corals create shapes and forms of seemingly infinite diversity. In aggregate and over time, as coral grows upon dead coral, stony limestone structures rise from the depths, building the towering cliffs, underseas mountains, vast flats, ridge crests, and other features that we call "coral reefs." But a reef is more than a structure: it is simultaneously a place, a thing, a landscape, and a crowd. It has both vitality and physical presence and shows us that the line between "geo" and "bio" is thin and blurry (cf. Madison Píškatá 2021).[9]

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I quickly learned that the live coral trade has two sources of supply which structure everything else about the industry. First, there are corals that are "farmed" using mariculture techniques. These farms take advantage of coral's ability to reproduce asexually through fragmentation: all you have to do is break off a small piece, and if cared for and given the right conditions, that piece or "fragment" will continue to grow into an adult colony, a clone of the original "parent," similar to propagating plants through cuttings. At

scale this can be a very effective and economical way of generating large numbers of high-quality corals, and coral mariculture makes up an increasingly large share of Indonesian coral supplies. Mariculture offers predictability: you can plan your production in advance, and you always have a sense of inventory—what is available, and what is not. However, mariculture has its limitations. The ongoing costs are very high, and you run the risk of natural or human-made disasters killing your inventory. Plus, not all corals are amenable to this kind of artificial propagation—and even those that are must originally come from somewhere.

This leads to the second source of supply: wild collection, where teams of divers like those aboard the *Two Sons* sail around and pick living corals directly from the reef. Compared to mariculture, wild collection is low-cost. But wild collection is inherently unpredictable. This unpredictability is both the source of its risk and reward: you never know what you will find. While distinct, these two production methods are also interconnected. Afterall, every farmed coral originates from colony that was once collected wild on a reef. And farms rely on wild collection for infusions of novelty—new species, shapes, forms, and colors—to keep their customers interested.

And there are many corals that are not well suited to farming. Many of these are known as "LPS" or "Large Polyp Stony" corals in the industry, referring to the relatively large size of their polyps, and in contrast to "SPS" or "Small Polyp Stony" corals which tend to grow more quickly when fragmented. Some LPS corals are extremely slow growing, taking years or decades to reach a mature, sellable size. And because they have very large polyps—sometimes just a single huge polyp—they are not easy to propagate by fragmentation; doing so may kill the coral. For this reason, many of the "LPS" corals in the market are collected live by divers; it is simply uneconomical to grow them in mariculture.

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Although hobby aquarium keeping emerged and slowly spread in the early 20th century, these aquariums at best had dead coral skeletons to ornament saltwater tanks designed for keeping fish. It was not until the 1960s that people began to imagine keeping living corals at home, and perhaps not surprisingly, it began in Indonesia.

Lee Chin Eng was a Chinese-Indonesian aquarist; today he is often remembered by hobbyists around the world as "the first reef keeper" or "the father of reef keeping." Despite his legacy, little information is available about Lee's life. He is sometimes credited as employed by the "Prinsenpark Aquarium," though elsewhere his work was described as building "large tanks that he maintained for hotels in their open lobbies."[10] It seems that Lee may have relocated to Singapore sometime in the late 1950s or early 1960s, joining many thousands of people fleeing a crisis of anti-Chinese violence and government policy.[11]

Through his magazine publications and extensive written correspondence with aquarium keepers around the world, Lee became highly influential in the aquarium world. In February 1961, Lee published an article in *Tropical Fish Hobbyist Magazine* outlining a method he used to keep corals and fish alive together in captivity. It was a method he credited to another Chinese-Indonesian man named Tan Soen Hway, from Banyuwangi, East Java (today one of the centers of coral mariculture), who developed it in 1955. The approach was naturalistic: indeed, Lee Chin Eng called his method "nature's system of keeping marine fishes." He used deep beds of coral sand and "live rocks" (rocks taken from the reef with all their attendant biodiversity) in his tanks to help filter and cycle nutrients. Lee Chin Eng's methods for reef keeping, often referred to simply as the "Lee Chin Eng method" or "the natural method," fundamentally transformed the hobby, inspiring every major system for reef keeping that subsequently developed. He began exporting Indonesian live rock to Europe and North America as his approach gained notoriety—kicking off the contemporary live coral trade.

Admiring Johannes Birkholz's reef aquarium in Linz am Rhein, Germany, in 1985. From left: Mrs. Birkholz, Johannes Birkholz, Svein A. Fossâ and Ingvald Erga. Image is free to use, share and publish with attribution.to Svein A. Fossâ & Alf Jacob Nilsen (1985).

Figure 2: The Berlin Aquarium Club, 1985.

Eng's approach inspired would-be aquarists around the world—but had a particular impact in West Berlin, where in the 1970s the Berlin Aquarium Club was experimenting with new ways to create coral reefs in miniature. By the 1980s club members were successfully keeping all manner of tropical reef organisms alive, including soft corals, corallimorphs, and ornamental fish, using what came to be called "the Berlin Method" (Figure 2).

The Berlin Method was developed to help solve the problem of cycling nutrients in the closed system of an aquarium; or put differently, the method was developed to deal with all the poop that accumulates in a tank full of living animals, including corals. The crux of the method included a few main elements: large amounts of highly porous calcium carbonate rocks (the "live rock" mentioned above) to provide habitat for nutrient cycling bacteria, extremely bright and powerful lighting for photosynthesis, pumps to generate

water movement through the tank, a protein skimmer to remove excess organic matter, and supplementary additions of trace minerals and calcium (in the form of highly caustic "kalkwasser").[12]

These techniques created a breakthrough in aquarium keeping. In 1985, German aquarium enthusiast Dietrich Stuber became the first person (or the first well known) to successfully grow a stony coral in captivity. Stuber and many others began a culture of sharing "fragments" from their tanks. Today, clones of this original colony, known as "Stuber's Acropora" or "Stuber's Stag" are found in tanks worldwide and can be purchased from numerous suppliers. Here is the description offered by one large supplier, along with a description of the coral's preferred conditions:[13]

> The Stuber Stag… is a direct descendent of the famous Stuber colony, one of the first corals to ever be kept in captivity and one of the oldest… corals available. It is a long branching coral with a chocolate brown base and baby blue growth tips. Stuber also has distinctive corallites that are longer and wider spaced than most of our other Stags. This coral grows more vertical then horizontal, so make sure to leave space above.
>
> Placement: All Levels. Lighting: Medium – High. Flow: Moderate – Strong.

Such reckoning of coral kinship and genealogy raises the question of origins and embodied lineages imagined as travelling *with* the fragment. The body of the individual is scattered far and wide—legacies of interconnection traceable through propagated colonies.

Far from Eng's "natural" approach to reef keeping, the hobby today is facilitated by finely calibrated technicalization. In addition to expensive artificial lighting, rigs today typically include complex filtration systems (sometimes even with an entire second tank hidden from view and stocked with nutrient cycling organisms), pumps and fans to maintain very particular patterns of water movement, finely calibrated salinity maintenance systems, and "protein skimmers" which remove organic waste matter to maintain oligotrophy. Hobbyists use terms like "functional redundancy" and "closed-loop

system" to describe their rigs, but maintain that this hyper technologization is in pursuit of "natural" water quality one might find on a coral reef.

The techno-utopic looms large in contemporary reef keeping culture. One of the most influential texts of the aquarium industry, considered by many "Reefers" to be a kind of bible, is *The Reef Aquarium Volume 3: Science, Art, and Technology* by Delbeek and Sprung. The authors, writing in 2005, imagined the work and play of aquariums as amounting to something bigger—not just understanding reefs by deconstructing and reconstructing them with their constitutive elements, but contributing to an important movement of "biospherics," which they say studies "the maintenance of living ecosystems with the goal of creating self-sustaining habitats separate from planet Earth" (Delbeek and Sprung 2005: 10). They continue:

> "It has even been proposed that this human pursuit of creating and cultivating living ecosystems is the means by which the living earth, Gaia, reproduces, a way that life moves from Earth into space (Sagan 1990) That notion puts a completely new perspective on the evolution of humans… and gives a great deal of importance to this *hobby* of reef aquarium keeping!" (original emphasis and citation).

Instead of teaching us to appreciate and protect the reefs we have on this planet, we are to imagine spreading them to other planets as we leave this one in the dust. Indeed, this entire text is dedicated to the project of replacement: finding technological or methodological ways to imitate a natural system when the living biome isn't there to do it for you—a theme that strongly echoes the ideas of loss and substitution that I discuss in this dissertation. The strategies employed by aquarium keepers include everything from purposefully "inoculating" their tanks by introducing populations of microorganisms to designing equipment that can approximate the processes nature gives you for free: the sun becomes a halide lamp; the protein skimmer replaces carbon fixation by detritivores; water currents become Accessory Pumps. Piece by piece, the hobbyist substitutes his way into a kind of cyborgic chimera, a mechanico-living system. If nothing else, the aquarium hobby has a

great deal to teach us about the unvalorized, unrecognized forms of work provided by the interconnections of living ecosystems.

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After word of the great successes of the Berlin Method began to spread, around 1985, imports of live coral exploded. In 1984, the year before Stuber's success, the US imported 871 pieces of live coral. In 1985 the figure jumped to 6,015, and by 1986 the US recorded imports of over 40,000 live coral colonies.[14]

Despite having banned the export of all coral in 1977, the Philippines remained the world's largest supplier of corals into the 1990s (CITES 1989), with the center of the trade being around the Zamboanga peninsula in Mindanao, where the Philippine state has long had limited efficacy. However live corals are not easy to smuggle, since they must be air-shipped; as the demand grew, Indonesian firms were able to step in and meet the demand much more easily because it was legal there.

The massively improved techniques of reef keeping in the last few decades have been met with an equally impressive spike in demand and supply. In the late 1980s several firms sprung up in Indonesia to furnish wild corals to this emerging market. While demand grew steadily throughout the 1990s, exports exploded in the early 2000s. The advent of cheap international air travel meant that coral could be easily transported alive, and between 2000 and 2009, CITES reported exports for the most commonly traded genus known as *Acropora spp.* skyrocketed from 90,000 to 630,000 annually— a 600% increase. Within a matter of days, exported corals find their way into home aquariums in Kyoto or Milwaukee, becoming part of the Indo-Pacific coral reef diaspora, in miniature.

This rapidly increased demand can be partly attributed to the growth of an internet culture of reef keeping as a hobby—similar to the internet's effects on other subcultures where it was previously difficult to "find your people" in the real world. While the industry had been served by a network of magazines and newsletters, the internet transformed the

space. Online newsletters, blogs, and forums sprung up for hobbyists to discuss their tanks and setups, exchanging knowledge and experiences, and encouraging newcomers. And more importantly, the internet facilitated the coalescence of a serious market for imported corals, able to bring together aquarium keepers from all over the country.

But the community built from the internet did not stay there: it has spawned a whole world of off-line events and meet-ups, often based around local regional clubs, but also coordinating events at a national scale. For example, Northern California is home to the "Bay Area Reefers," an active group of hobbyists who meet online and in person. For 2022 their line-up of events includes talks on coral identification, happy hour and restaurant meetups, workshops teaching key aquarium skills, behind the scenes tours of local aquariums, book talks, tide pool trips, and a holiday potluck. But the core event for many reef keepers are the "frag swaps," where reef keepers meet up and exchange fragments of their favorite corals. Frag swaps exist at every level—the Bay Area Reefers host their own small frag swaps (members bring their corals in clear deli containers filled with tank water). But then there are dozens and dozens of events all around the country, from travelling "coral farmers markets" to the famous "Reefapalooza," a massive event closer to an industry tradeshow with some frag-swapping.

In a "pure" frag swap, no money is exchanged—you bring a coral, and you leave with a coral through barter or some kind of blind exchange. But this is increasingly uncommon as the hobby has commercialized. In a blog post from 2022, one observer reminisces how different the industry is today compared to 10 years ago, noting that he was shocked to look at old pictures of a frag swap from 2013 where the highest price for any coral was $40, and the fragments on offer were massive—compared to what he called todays "market valuation" of the same corals in the hundreds of dollars for a miniscule piece.[15]

These events—along with the circulation of high-saturation, artificially lit photographs of corals—are key in the production of hype that helps keep corals in circulation. The ingredients to hype are in some ways predictable: intense color and novelty. I can't help but be reminded of other mildly obsessive hobby-communities who are truly understood only by their own members. Reef tank keeping feels to me reminiscent of sneakerheads waiting for the latest drop and then buying and recirculating aftermarket shoes in a speculative frenzy, combined with a little of the tinkering and glam of classic car culture, with a splash of houseplant frenzy.

Instagram is one of the best places to see the breadth and diversity of the coral trade—and a main circulatory artery for those high-saturation tank pics. Years ago I started to follow reef keepers to learn something about their world. It struck me that one of the most popular hashtags they use is #AllMyMoneyGoesToCoral. It's a joke where the humor derives from proximity to the truth. That money—huge amounts of money—flow into these socially elaborated channels and trade networks and swap patterns that circulate in the coral world, connecting them back all the way to Indonesia, onto the deck of the *Two Sons* and other diving boats like it.

Coral City

I never planned to do research in Southeast Sulawesi—it happened by accident. Since starting to research the Indonesian live coral trade in late 2015 and 2016, everyone told me that while Jakarta was the main export hub, and Bali was the center of coral mariculture, Sulawesi, especially the city of Makassar, was the center of wild coral collection. So, when I finally began long-term research in late 2017, I began in Makassar, where I had a few contacts. However, I quickly learned that while there might be many coral warehouses in Makassar, the real action lay elsewhere—especially in Kendari, the capital of Southeast Sulawesi province.

It turned out that Kendari had 11 coral companies at the time—more than any province outside Bali. All of these companies specialized in collecting wild coral, but some also dabbled in mariculture. The volume of corals significantly exceeded that traded through Makassar, as did the number of divers employed. In fact, I later learned, much of the corals exported through Makassar were actually from Kendari—since the supply was much greater on the eastern coast; the magic of paperwork helped make it appear otherwise. But while the companies in Makassar liked to promote themselves, the vibe in Kendari was decidedly less public: few people knew that Kendari was the real center of the wild coral world, and most companies preferred it that way.

Just after the new year 2018, I caught a flight to Kendari and never looked back. I had only one contact in the city's coral world—the branch manager, Pak Rajin, for one of Indonesia's largest coral companies, PT. Cipta Berkat Bahari, headquartered in Bali, but with field offices around the country. Eventually he agreed to meet, and more importantly, he agreed to let me meet his divers.

"Come back tomorrow night," he said. The divers were coming into Kendari to drop off a delivery of ornamental fish—and would spend the night in the warehouse before heading home the next day. I went to meet them, and we talked. I excitedly asked too many questions. How did they know where to dive? And what corals to collect? Had they noticed changes in the reefs during their years at sea? They politely tried to oblige my curiosity—but wouldn't it be easier, the divers suggested, if I just came along and saw for myself? The crew's leader, Imran, told me that he had a spare room in his house—I could stay there. I rushed home that night to pack my bags, and the next morning I came back to the shop to find the crew preparing to set sail for what one of the divers jokingly called "Coral City." With no idea of what was to come, I stepped foot on the *Two Sons* for the first time.

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The journey from the warehouse in Kendari to "Coral City" took about 3 hours, passing small islands and weaving around mazes of coral reefs hidden just below the surface, while staying out of the way and wakes of much bigger cargo and passenger ships busily sailing in and out of Kendari's several ports. We soon entered the sheltered waters of Teluk Moramo, a large horseshoe shaped bay where the Banda Sea meets the rolling hills and riverine swamps south of Kendari (see Map 1).[16] In the distance the forested mountains of the Tanjung Peropa peninsula, forming the bay's eastern edge, rose up and out of the mist, reaching about 700 meters (2300ft) at their highest before plunging steeply into the ocean on either side. In a route that I would come to know well, Imran set our sights set at the mountains, navigating carefully towards the edge of peninsula, where a natural channel gave a straight shot to our destination: Nambowatu, aka Coral City. [17]

Nambowatu is nestled along a small baylet—a long, snaking row of houses perched between the steep hills and the sea. Originally, there was no flat land at all for building houses; everyone made stilted houses that straddled the intertidal zone. But by the time I arrived in 2018, over half of the village sat on plots of "reclaimed" land—essentially piles of rock, sand, and dirt pushed off the hills into the sea, and leveled out to create a flat surface for construction. On the reclaimed land, people built concrete houses with zinc roofs, leaving behind traditional vernacular construction techniques using wood and thatch.

In Nambowatu I lived in Imran's small but cozy house near the end of the village. Like every other house, it was just steps from the water. It had once been a wooden house on stilts, but over time they "reclaimed" the land underneath it and eventually saved enough money to pour a concrete foundation and build walls out of cement bricks. Imran lived there with his wife Lidya and their four kids; when I came back to visit in 2019, there was another new baby who did not yet have a name. Just next door was a house belonging to Lidya's parents, who went by Mama and Bapak Eka, teknonyms taken from their eldest

daughter Eka, Lidya's oldest sibling. Bapak Eka was himself a former coral diver, but had given it up in favor of spending more time on land. Their house was much bigger, with ample room on the wide, cool concrete floor for all three generations to congregate when eating or telling stories.

Nambowatu is one of about two dozen villages that dot the shoreline of the Moramo Bay and the peninsula—all of which are woven together socially and economically by dense webs of kinship and friendship. Like all these villages, Nambowatu was an ethnically diverse place; the majority was Tolaki (though this changed from village to village), with Bugis, Butonese, Muna, Wawonii, Kulisusu, Wakatobi, and other groups represented, and much of the community proudly embraced a mixed ethnic heritage. The village was home to about 600 people, and around 120 houses, woven together by a narrow path and a series of boardwalks that crossed the swampy intertidal parts, running all the way from one end to the other, and on to the neighboring village. It had its own elementary school and shared a middle school with the neighboring village—an improvement from the days when children would paddle to class each morning to a village several kilometers down the coast). Students interested in high school were still forced to move to another village or to the city to live with relatives.

Although it had almost no cell service, the village was powered by a small "off grid" solar array installed as a government development project, generating just enough electricity to keep the lights (and TVs) on at night, and had gravity-powered running water sourced from a natural spring high in the mountains. The common wisdom was that this spring water was so sweet that once you drank it, you could never forget Nambowatu—and it would always bring you back, no matter how long you are away.

People began to settle in Nambowatu during the 20th century, often fleeing from conflict elsewhere, and they first got by on a mix of subsistence fishing, sago palm harvesting, and upland rice cultivation. The first settlers cleared the lowest reaches of forest

to make swiddens focused on upland rice, planting seeds in December to be watered by the west monsoon rains from December to January, and harvested during the inter-monsoon period around April. Upland rice is still imagined as a central part of Tolaki cultural identity, linked to many rituals and the propitiation of the rice goddess, Sanggoleo Mbae (see Tarimana 1989 for more). The popular Tolaki circle dances called "lulo" are tied to the rice harvest; in the version I heard, "Lulo" derives from the Tolaki verb "molulo," meaning to "trample," referring to the trampling of harvested rice to thresh the grain, an activity of spiritual and communal importance which was always done in community with one's kin and neighbors, taking turns to thresh the grain from each family's fields.

Indeed, like the circular lulo dance, the image of the circle looms large in Tolaki cultural institutions, especially in the figure of the "kalo," (T: "ring" or "circle," also "knot" or "snare"). A "kalo" is both a physical object and a symbol of binding ties, continuity, harmony, the circle of time, and the joining of disparate elements into an unbroken whole (Tarimana 1989). Different kinds of kalo made from different materials are used in all manner of ways—to negotiate resolution to conflict or dispute, to anoint a new ruler, to lay the dead to rest, or to consecrate a marriage—and many more.

By the time I arrived, nobody in Nambowatu was growing upland rice anymore; everyone just bought their rice on credit from sellers across the bay. The village had an heirloom *kalo sara* made from rattan floating around somewhere, but nobody I knew was sure exactly where it was. The lulo dance, however, is still the climax of any good party. In the past the dance was done to drum, gong, and gambus (a kind of guitar like instrument); today in most cases only the wildest techno music will do. The rice is still there, but now in the form of pongasi, a fermented rice beer which fuels the party late into the night.

By the 1980s with the arrival of motorized boats that facilitated easy transportation, more and more people had begun to orient their economic lives around producing commodities for market. This meant giving up rice growing to plant tree crops

like coffee, cashews, and cloves. It also meant an increased emphasis on gathering marine products and fishing as a source of cash.

Things really changed in December 1986, when most of the mountainous peninsula behind the village was turned into a Wildlife Preserve, the Suaka Marga Tanjung Peropa. People referred to the reserve somewhat ominously as "the Area," or "Kawasan," a bureaucratic term of Indonesian governmentality and a shorthand for "kawasan konservasi," or "conservation area." The protection came because these mountains are among the very few places where isolated populations of the critically endangered *anoa*, two species of miniature wild buffalo, genus *Bubalus*, are still found on Sulawesi.[18] The kawasan covered some 40 thousand hectares—including almost all of the peninsula, as well as a vast area to the south on the mainland. While some people continued to harvest timber, swifts nests, rattan, honey, and other forest products from the Kawasan, this was risky—only the bravest and sneakiest dared it. After all, it was common knowledge that the government had installed CCTV cameras at the boundaries to the "Kawasan" in order to catch trespassers.[19]

The formation of the kawasan brought the arrival of what Tania Li (2014a) has called "land's end," the closing of the land frontier that had previously made settling along this peninsula a viable, even attractive, prospect. Those with cleared land were allowed to continue farming—creating a stratification between families who had land and those who did not, between those who had arrived before 1986, and those after. Those without land would have to find other ways of getting by—including taking whatever odd jobs they could get around the village, or working as hired labor for their land-holding neighbors. Unable to accumulate the money needed to build "modern" homes, these landless residents were more likely to live in traditional wooden houses on stilts, and less likely to own their own boats or other signs of wealth.

The end of the land frontier meant a renewed importance on the sea as a source of livelihood—including both subsistence and market production. It was in this context that coral collecting first appeared in the late 1990s. For nearly two decades coral brought good fortune to Nambowatu—it built new houses, bought boats, paid for school fees and medicine, and put food on the table. Coral and its webs of good fortune made it possible to build a life.

It was back in these early days that Imran had moved to town—as a young diver working for a big coral company. Having grown up on the nearby island of Wawonii, and then spent most of his youth working as a commercial diver aboard Hong Kong based luxury seafood fishing boats, Imran was adventurous—hungry for new experiences and eager to chase his fortunes wherever they might be found. To his surprise, he made a life here, and ended up staying for good—marrying the daughter of an older coral diver, starting a family, and building a house. Perhaps there was something in the water after all.

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As long as there have been people in Indonesia, they have relied upon coral reefs for food, beauty, magic, medicine, and countless other uses. Among the greatest gifts of reefs is their immense generativity of fish and other kinds of seafood: bivalves, lobster, crabs, sea turtles, sharks, urchins, rays, algae, and many others. Reefs are also key sources of building materials, especially on small sandy islands with few trees: coral stone is lightweight but strong and easily stacked into foundations or walls. And they offered protection from rough seas, diffusing strong waves into gentle ripples. These many gifts of coral reefs made it possible for humans to live in otherwise inhospitable places.

Reefs also furnished important trade goods which circulated among and between communities across the archipelago. With the advent of European colonialism came forms of rapid commodification of many reef organisms which became central to complex circuits of capitalist exchange, accumulating riches for imperial power. Indonesian sea cucumbers,

for instance, became central to European efforts to extract valuable tea from China for resale on the European market. Other reef products like pearls and pearl shell, shark fin, red and black coral, and tortoise shell all had similar histories and careers in the shaping of interconnection at a time of global trade and nascent colonialism. These products and their entanglements had far reaching impacts, fundamentally reshaping the organization of labor, exchange, and geopolitical power not only in Indonesia, but around the world (e.g. Warren 1981; Sutherland 2011; Tagliacozzo 2004; Spyer 2000; Vickers and Martinez 2015).

One such place with a long history as an important source of valuable marine products is the coastal capital of Southeast Sulawesi province, Kendari. Kendari stretches around a large teardrop shaped bay with a narrow entrance hidden from view by a small island; beyond the island are among the calmest waters of the Banda Sea—shallow and warm, with extensive coral reefs stretching for kilometers in all directions. The coasts were also full of productive wetlands offering tasty clams and mussels, crabs, shrimp, mangrove fruit, and more, and the bay was deep and clear and full of fish.

For centuries the coastal wetlands and waters around Kendari were storied for their richness, and were long home to many different communities, especially Tolaki agriculturalists and the maritime oriented Sama-Bajo people, who would visit as part of long harvesting and collecting voyages as they followed the monsoons up and down the coasts of Eastern Sulawesi (cf. Lowe 2006).[20] Many stayed, making homes on the shores, reefs, and small islands around the bay's entrance. Bugis and Butonese exiles and sojourners from around the archipelago also came and went—and all of these groups met on the shores to trade, sometimes making new lives and new communities together. This was how the mixed settlement that would grow into Kendari was born.

As a colonial outpost, Kendari's expansive and productive intertidal systems—mudflats, nearshore reefs, seagrass beds, mangroves, and estuarine swamps—provided

endless supplies of valuable marine products for projects of imperial wealth and power. But today, once sleepy Kendari has become a sprawling mining boom town and one of Indonesia's fastest growing urban areas; census data shows that between 2000 and 2020 the population grew by 75%, its expansion buoyed by proximity to the some of the world's largest nickel laterite deposits.

But in addition to minerals, Kendari remains a center of fisheries and marine product economies, in part due to the luck of geography. Kendari and the waters around it, including the Moramo Bay, sits near the center of the so-called "coral triangle" which stretches across much of Island Southeast Asia and Melanesia, marking the world epicenter of marine biodiversity. But even compared to other parts of Indonesia, Kendari waters stand out for *coral* diversity. A local marine biologist friend from Halu Oleo University explained that the hypothesis for why is because of the city's felicitous geography, sitting at the confluence of two major oceanic currents that crisscross the Indonesian archipelago, terminating here at a complex of sheltered, shallow, warm waters with ideal conditions for larval recruitment. The working theory is that coral larvae travel here from all over eastern Indonesia, riding the currents for days or even weeks before settling down and finding a home along the protected coast. With luck they will grow into healthy, beautiful colonies—giving rise to their own fractalized multispecies social worlds, and spinning webs of fortune for themselves and for a litany of others.

And yet, the Moramo Bay—with its relatively murky waters and proximity to industrial shipping and mining—was largely left behind in pushes to protect important marine habitat. Instead, the city's industrial alignment has made these waters into a kind of salvage yard for marine products. Indeed, nobody paid much attention to the aquarium industry. Who cared if they picked corals here, from reefs that were likely to be blown up or buried anyway?

However, this view was beginning to change around the time of my research. There was vague awareness among divers of government plans to turn the waters of Moramo Bay into a marine protected area—rumors had been flying for a few years, spurred on by occasional sightings of government survey boats. In fact, I later found out that the entire bay *already was* a marine protected area—but nobody had bothered to tell the divers. Moramo Bay was declared a "regional" marine protected area in 2016 by decree of the governor; its status as a "regional" park, rather than a "national" one meant that management and enforcement was up to the provincial government—and as far as I could tell the status had little impact.[21] Indeed, few of the people who lived there had any idea such a decision had been rendered.

But then in 2021, a new decree by the Ministry of Fisheries elevated the status of the bay to a national marine preserve.[22] With jurisdiction of the park moving to the national government, it remains to be seen how management or enforcement may or may not change. The decree means that Nambowatu is now bordered by "Kawasan" on all sides. And yet, most of the new marine park is zoned as an area of "limited utilization," a term which is as flexible as it sounds. It indicates an unpredictable future where everything could change—or nothing at all.

Running for Mackerel

While the sea had provided a good life for communities around Moramo Bay for several generations, by the time I began my research, the long-term viability of marine livelihoods was being openly questioned, highlighting the precipitous decline in marine biomass that had made living here not just easy, but even lucrative.

One morning, a couple of months after I had been in Nambowatu, I was sitting outside with the family when a small boat puttered toward the shore. Suddenly, realizing who it was, everyone started screaming and yelling: "RUMA-RUMA! GO MITHA, HURRY!!"

Before I could figure out what was happening, Lidya's sister Mitha had hiked up her flowery yellow muumuu and hightailed it out of the hut where we sat, sprinting first into the house and then back out with a large wallet before racing off down the path to where she knew the boat would land. I asked what was happening, and Mama Eka replied excitedly—he's selling fish! Ruma-ruma! By the time Mitha made it, a small crowd of neighbors had already gathered; clearly these wouldn't last long. A few minutes later Mitha came strolling back down the lane with two strings full of beautiful, silvery fish, one in each hand. "HOOOY!" Mama Eka called back in glee, jumping up to get to work building a fire. "Joe we are going to smoke them—and then you'll finally taste something good!" she said while chucking coconut husks into a little stone firepit. You can cook ruma-ruma all kinds of ways, she explains, but nothing compares to lightly smoking them over a coconut husk fire and serving them with a lemon, tomato, and chili relish. They were indeed extremely delicious.

Given the commotion, for a long time after, I assumed that ruma-ruma (commonly called "Indian mackerel" or *Rastrelliger kanagurta*) was a rare delicacy. [23] I was later corrected. While delicious, ruma-ruma was supposed to be common—an ordinary fish that schools in large numbers in these warm shallow waters, feeding on the planktonic larvae of shrimp and other fish. It's just that in recent years there have been fewer and fewer. As the shrimp and fish whose larvae feed them disappear, the ruma-ruma have come less often to the Moramo Bay, and in smaller numbers—so much so that when a boat that might have some begins puttering into town, it's worth it to run.

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I came to think of this scene—of running for mackerel—as capturing something important about changing fortunes, and about the ways that people live through and experience environmental change.

People in Nambowatu divide historical time into a "now" and a "before," (I: dulu) where change is measured in fish. "Before" all you had to do was cast a hand-line into the water right in front of the village and you could catch your dinner. Good fish, too—grouper or snapper, not parrotfish as was commonly eaten today. That is no longer the case. Indeed, despite Imran's dining table being just steps from the water, fish were surprisingly hard to come by during my research.

"No fish tonight," Imran tells me one night sheepishly, laughing. It was a familiar exchange after months of living with him and his family. There was, in fact, fish being served that evening, but they were anchovies—by Tolaki standards too diminutive to count as fish in any serious sense other than the merely biological. Still, this dish was my favorite: tiny anchovies fried whole in a sticky tamarind sauce—I could have eaten it every day. In the recent past, anchovies were so plentiful that people freely gave them away—like sharing a cup of sugar back and forth with your neighbor. But by 2018, there were many days that even the anchovies ran out—something that would have been unimaginable a decade ago, and a sign that made everyone uneasy. What would the future hold if this was the present?

Nambowatu is not alone in this experience. Nearly every marine ecoregion on the planet has experienced extreme declines in fish stocks during the past 50 years (Palomares et al. 2020), and research suggests that today's populations of predatory fish is less than 1/3 what it was a century ago (Christensen et al. 2014). Globally the quantity of fish caught each year peaked in 1996 and has been declining ever since (Pauly and Zeller 2016). And those declining catches represent a massive *increase* in effort—a classic "chasing less with more" scenario. As one study concluded "for the equivalent fishing power expended, landings from global fisheries are now half what they were a half-century ago, indicating profound changes to marine environments" (Watson et al. 2013: 493; see also Palomares and Pauly 2019). While many factors like climate change, ocean acidification, marine

pollution, and eutrophication contribute to the problem, the primary driver is unambiguous: too much fishing, particularly industrial fishing.

A key concept from fisheries science helps to make sense of these stories: the idea of "shifting baselines," sometimes called "shifting baselines syndrome" (Pauly 1995), which names the processes of ecological memory and forgetting that occur on time-scales incompatible with individual human experience. The gist is this: No human alive can imagine the kind of ecological abundance—the sheer mass of life—that was enjoyed by our ancestors, because our "baseline" experience is of a world which has already been radically depleted. Even the healthiest, most protected, most "in-tact" forests or reefs today are mere shadows of what existed just a few generations ago.

Indeed, the abundance of marine life a few centuries back would be fundamentally unfathomable, unbelievable to us. The Tortugas in the Caribbean were so named because they were surrounded by so many green turtles—*millions*—that from a distance the immense rafts of their shells appeared to be islands; today there are almost none (Jackson 1997). Indeed, the key example used by fisheries biologist Daniel Pauly in his original "shifting baselines" article is a story of a friend's grandfather, fishing in the 1920s, who was constantly annoyed by all the bluefin tuna—today an endangered species and the most expensive fish in the world—that got stuck in his mackerel nets. And although the waters around Kendari were once among the richest sea cucumbers and turtle fisheries in Asia—the entire reason for colonial settlement there—I don't remember seeing more than 1 or 2 sea cucumbers in over a year of research, and only twice did I spot small sea turtles. In the 19th century, collectors would literally rake sea cucumbers up from the bottom of the sea like fallen leaves—now it can take weeks of diving and collecting before gathering enough to sell.

The effects are jarring: we see blasted, destroyed landscapes and call them "nature." Today's fortune is yesterday's "ordinary," or even "bad luck." And yesterday's fortune today would seem like a fantasy, a miracle beyond our wildest dreams.

A key effect of this is that fish, once ordinary, has now become like cash—a token you can swap for exchange value, an undeserved luxury. People who managed to catch a big fish of a valuable species were often loath to eat it, knowing that they could sell it and use the money for something they really needed. Once when Imran chanced upon a lobster while diving, he joked that eating it would be like "eating money"—he sold it, and used the value to pay down his debt.

While Pauly's theory of shifting baselines was originally developed to describe the difficulty posed by change so gradual that it wasn't noticed on the scale of a single human life, something else is happening in Nambowatu: dramatic, rapid change happening in just a few decades. Mama and Bapak Eka, Imran's in-laws, had seen the fish disappear between the time they got married and my arrival—just 36 years. And with the fish went the crabs, the turtles, the giant clams, the deer, the first-class timber in the forest, the mangroves, the sago palms, and even the predictability of the rains. Imran's kids would never know a Nambowatu where you could just drop a line in front of the house and catch your dinner. But the problem of shifting baselines runs both ways. We can't imagine how much worse it might get—a world in which running for mackerel would seem like a blessing of good fortune.

Figure 3 (top): Nambowatu | Figure 4 (bottom): Imran and Lidya's house.

Methods

This dissertation is based on 23 months of research conducted between 2016 and 2019, including 14 consecutive months from November 2017 through December 2018, plus ongoing historical and online research. I had hoped to continue research in 2020 and 2021—until the world was suddenly turned inside out by a novel coronavirus.

Indeed, the COVID-19 pandemic changed the course of my research and writing. I was fortunate to have completed extensive research before the lockdowns began. Yet as I wrote, new questions emerged that I wasn't able to ask or answer, and gaps in my knowledge remained unfilled. Even when the lockdowns had ended, the virus found ways to frustrate my ambitions: I got sick with COVID for the second time just before I was scheduled to attend "Reef-A-Palooza: Anaheim" earlier this year. A rich ethnography of the far side of the coral trade will have to wait.

In Nambowatu, I went to sea as often as I could with the diving teams, both for coral and ornamental fish collecting. Other days when the teams were on shore or away in the city, I spent my time with Imran's family and neighbors, helping out with odd jobs as I could and tagging along to whatever the day's tasks were. In the afternoons when most of the village was napping, I would often head to the reef at the edge of the little peninsula for snorkeling and free diving. The cold water would snap me awake, and the high sun offered the brightest light for the often-poor visibility waters. In addition to Nambowatu, I spent time in several other small villages along the shores of Moramo Bay, some of which were involved in coral trading, and others which were not.

When I wasn't in Nambowatu, I kept a small room in Kendari from which I visited different parts of the city and the surrounding area. I interviewed marine scientists, fisheries officials, non-profit workers, recreational divers, fish market vendors, and anyone I could find who cared or was interested in the ocean. Once I began looking more into Kendari's political economy, mining sector, and coastal development, I interviewed people

with proximity to the mining sector, pollsters, social scientists, logistics managers, construction workers, forestry students, and ordinary people trying to navigate a life in Kendari's urban infrastructure.

I also travelled around different parts of Southeast Sulawesi to get a better sense of the regional context—especially other coastal regions. I spent time in Baubau, the northern coast of Buton island, and a few weeks in the Tukang Besi archipelago.

With a few exceptions where interlocutors preferred to speak in English, my research was conducted entirely in Indonesian—with people most often speaking to me in the regional "Logat Kendari" dialect / accent in use around much of Southeast Sulawesi. Logat Kendari is similar to other regional dialects in southern Sulawesi, including Logat Makassar, and it serves as a bridge between speakers of the province's dozens of languages—32 provincially indigenous languages in Southeast Sulawesi alone according to the best estimates available (not counting Indonesian, Sama-Bajo, Bugis, or Chinese dialects).[24] Considering that many of these languages have their own regional dialects and different speech registers, the complexity can become bewildering—even for locals. Imran, for instance, grew up speaking Wawonii, a language closely related to Tolaki. He would frequently joke that when people spoke Tolaki in the village he could understand about half of it, and then when he replied in Wawonii, they got about half of that—for a total of 25% understanding.

Tolaki was the lingua franca in Nambowatu, especially among older generations, and speakers often switched between Tolaki, Logat Kendari, or another language depending on who was gathered and their facility with Tolaki. Even so, just in our small neighborhood lived native speakers of 5 different regional languages—a Butonese family would speak among themselves in one language, speak Tolaki with the Tolaki speakers, and speak Logat Kendari to everyone else—including me. I did my best to learn as much Tolaki as I could, which in the end was very little other than the speech of a toddler: the names of

some plants and animals and foods, how to talk about the weather, how to tell people where I was going, whether I was hungry, and so on. Nothing was more hilarious to my neighbors than to hear me repeatedly decline their offer of a cigarette with "oki ku po'ombi."

Because of the central role of diving in my project, I invested a lot of time in dive training before I began research—not only for the technical proficiency that would help me do research at sea and underwater, but also as a means to get to know a new ecosystem and its inhabitants. In 2017 I completed AAUS Scientific Diving training with UCSC. This was by far the most comprehensive dive training I have ever received (I'm still grateful to be able to tie a bowline with my eyes closed while wearing thick gloves and holding my breath—thanks Steve). In Indonesia, I also scheduled time before I began field research to complete a Dive Master course, and to work for a short time as a volunteer Dive Master with a local marine science nonprofit based in Buton, Southeast Sulawesi. The placement with a marine science NGO like this was ideal: between the local dive guides, Indonesian and foreign reef scientists, and curious students, there was hardly a better place to burn through my curiosity about the different organisms I encountered. While the AAUS training made me a good diver, the local dive master training taught me how to get to know Indonesian coral reefs and placed me in the middle of debates and conversations about human-reef relations.

After arriving in Nambowatu, when I determined that the logistical and safety hurdles of using SCUBA to dive alongside coral collectors were too high, and since I could not dive on the compressor, I decided to enroll in an AIDA free diving course. Free diving—that is, diving while holding your breath—allowed me to safely observe the divers at work, without the burden of heavy equipment. It also had the unexpected benefit of helping me understand the parameters of marine product economies that had been based on free diving for centuries before the introduction of diving compressors in the 1980s. Thus for most of my research, I relied on simple unweighted breath-hold diving in order to observe

my friends at work. For safety I restricted my dive time to 60 seconds, and would take long recovery intervals between my dives where I would observe from the surface with a snorkel. This worked great when visibility was good, but was somewhat limiting with poor visibility. In late 2018 I also organized a few weeks of SCUBA diving using rented tanks brought to the village and the assistance of my partner in order to better observe my friends at work.

Diving was critical not only for the simple reason of being able to follow and watch divers at work, but for the way that frequent diving attunes your senses to the underwater landscape. Like all landscapes, reefs have been shaped by their long histories of human habitation in ways that are difficult for us to imagine or study given the shallowness of our ecological memory—that is, without time travel, we can't imagine what the reef was like just a generation ago when biomass was far greater (Jackson 1997). Still, like terrestrial systems, you can learn to read something about a place's history through the forms of its inhabitants (Mathews 2022)—to read how history (at least recent history) has inscribed itself on the reef. Rubble is a good example: a sign of mechanical destruction. The composition of fish communities can likewise teach you about history: huge schools of herbivorous parrotfish might indicate a history of extraction of predatory species like groupers and sharks. These kinds of semiotics of history are everywhere on the reef (cf. Kohn 2013)—to learn to read them takes time and commitment to arts of noticing (Tsing 2015).

Chapter Overviews

This dissertation contains eight chapters, plus this introduction and a short conclusion. Scattered between the chapters are shorter ethnographic interludes which help to connect the dots in my stories, provide counter-examples, and further develop themes from the dissertation.

Chapter 1 explores the economies of permission that structure the live coral trade, examines the lives workers who work within it, and traces the regulatory system through

which it wends after it has been pulled from the sea. Chapter 2 continues to examine the power structures within the live coral trade that separate bosses from workers, especially divers, and tells the story of the diving compressor as a tool of labor augmentation. Chapter 3 turns to look at economic and commercial cultures in Nambowatu and the surrounding areas, exploring the many different kinds of "experiments in fortune" that people turn to as they attempt to build a life. Chapter 4 returns to the *Two Sons* to examine how divers come to know the reef through commodity categories, and how diving labor helps to enact those very categories. Chapter 5 turns to the question of regional and local histories, examining the longue durée patterns of marine product economies and the histories of violence that have driven coastal settlement patterns in Southeast Sulawesi. Chapter 6 continues the theme of reverberating histories of violence to examine the genealogy of bomb fishing, which traces its origins to the wars and technological revolutions of the 20th century—and how the bomb has remade fortune itself. Chapter 7 examines coral mariculture and reef restoration—asking what it takes not just to grow corals, but to re-grow an entire coral reef, raising questions about the substitution of human labor for natural processes. Finally, Chapter 8 examines the political economy of industrial mining and coastal development by following the movement of displaced dirt as it is trucked around the province, and asks how land reclamation remakes the meaning of property. I conclude with some reflections on the compulsion to economic creativity and the question of what comes next after the coral trade has been re-opened—and what kinds of futures coral divers imagined for themselves, and for the reefs.

Along the way, the ethnographic interludes try to give texture to the story—to show what it feels like to live through and navigate a time of ecological and political change. We sit with enchanted and disenchanted and re-enchanted landscapes, ponder the problem of taming unruly natural forms of value production, revel in the pleasures and terrors of seeking riches on the frontier, dissect the rushes that drive us to give it all up and take a

wild chance on a long shot, query the senses of belonging that create guardianship on the one hand, or practices of "stealing livelihoods" on the other—and to ask what it means to remember or forget the meaning of fortune itself.

While answering my questions sometimes takes the story away from the reef, it always returns. Indeed, the heart of this story is a curious kind of commodity, living coral, and the novel forms of production and labor that emerge to supply it to global markets against all odds. Coral built new lives, new worlds, new communities, new futures, and new dreams. It offered a chance at a kind of freedom and prosperity and ease that few dared to imagine for themselves. It represents the refusal to give up on the dream of a better life or the promise that fortune might find you yet. And so, my story begins and ends with the divers of Southeast Sulawesi, who showed me that with some tenacity and a bit of luck, you might just get the world for a coral.

INTERLUDE
The Work of Fortune

When I use the word "fortune" in this dissertation, I am referring to the concept of "rejeki."[25] In Southeast Sulawesi, rejeki names the kind of good luck that fills your nets with fish: a windfall of fortune, often arriving when you least expect it. Marine product collectors and fisherfolk head to sea each day to "search" for rejeki, hoping to stumble upon a hidden moot of valuable sea cucumbers or to haul in a large catch. But finding one's rejeki often requires negotiation of a complex world of more-than-human agencies, including indifferent spirits who guard the reefs, and the will of God. Navigating these different agencies in pursuit of rejeki means positioning yourself to be ready to act and seize the moment, to always be prepared for an unexpected blessing that might come your way.[26]

Rejeki was among the most common ways that people discussed and spoke about livelihood. It was often cited as a difficult to pin down variable that could fulfill or frustrate your economic aspirations or projects. Perhaps the most common verbal expression of this was to say that success or failure "depends on your fortune" (I: tergantung rejeki). A commonly cited example in Nambowatu: behind Imran's house, two people had two cashew gardens on the same hill, directly next to each other. They had the same aspect, the same slope, the same soil, and received the same rain; their trees were the same age, from the same seed stock, and they were cared for in the same way. But one orchard prospered while the other lagged behind. Why? It depends on your fortune.

Fortune, in turn, depends on divine beneficence; indeed, in many cases "blessing" feels like a better translation to describe the gifts of good fortune that come as rejeki. But while rejeki may fill your nets with fish, this divine will works both ways. In a short essay on rejeki, Herriman, Acciaioli, and Winarnita (2022) share a meme that has circulated widely on Indonesian and Malay social media—an illustration of a man in a boat in water

full of fish, all of which are avoiding his lonely fishing line. The caption says: "If God says it's not our fortune, then it's not our fortune."[27] In one modified version, someone has edited a giant, monster fish onto the design just below the man's fishing line, with the additional caption: "Maybe fortune will come in a way we don't expect."

Rejeki is also a way of putting things into circulation. One day when I came back to the village, I brought a few big bags of rambutan I picked up at the harbor; there were no rambutan trees in Nambowatu, so this was something different, a little special. As usual, I gave the fruit to Imran, Lidya, and Mama and Bapak Eka as my hosts; they would in turn happily share them with all of our neighbors—the flow of gifts and reciprocity that kept the family, real and fictive, closely knit. But rambutan are weird looking: a thick shell of leathery hairs hides the tasty white fruit inside. One of the small children who had never seen a rambutan made a grossed-out face when it was pressed into her hand. When she tried to give it back, her mother, Mama Ezra, refused, and snapped: "Itu rejekimu!" That's your fortune! She said this sternly, as a lesson, a reproachment. The lesson was that it is your duty to receive the rejeki that comes your way—you cannot refuse it. A few days later, we were all sitting outside talking, when Ezra, the little girl's older brother, wandered over carrying three large, fragrant, green guavas with delicious white flesh, recently ripe on his mother's tree. He just silently walked over and handed one to Lidya, one to Bapak Eka, and one to Mama Eka—without saying a word. They all smiled, and laughed, and kept asking him "Why?? Why???" but he was too shy to answer. Finally, Lidya, laughing, asked "From your mom?" He sheepishly nodded before running off. A guava for some rambutan, a sign of fortune shared, and then shared in return.

Rejeki is not timeless; it has a history, just like any idea, and its content and form are made and remade in political, economic, and historical context. As new tools and technology are onboarded, for instance, they offer up their own forms of rejeki, such as the fortune conjured by detonating a green revolution fertilizer bomb (see Chapter 6).

The Indonesian idea of rejeki has its origins in Islamic theology and the idea of "*rizq*," your daily bread or sustenance provided to you by God. It likely arrived in Indonesia with Muslim traders in the 14th century, after which it took on a life of its own. Key to *rizq* is trusting that you will be provided for by God—a common element across Abrahamic theology. Consider stories of heavenly manna falling on the deserts of Egypt, or in Christian scripture where the concept is exemplified in the gospel of Matthew, when Jesus teaches the "Lord's Prayer" with its invocation to "give us this day our daily bread,"[28] and in which he instructs the people to "Look at the birds of the air; they do not sow or reap or store away in barns, and yet your heavenly Father feeds them. Are you not much more valuable than they?" And yet both rizq and rejeki must also be worked for. As a famous hadith instructs, faith must be paired with action: "Tie your camel, then have trust in Allah."[29]

This discourse of diligence is another way rejeki is used. One day, as one of Imran's divers was sleeping late into the morning, Lidya walked in shouting and laughing and teasing him: "WAKE UP UDIN! The sun is high! Your fortune has already run away!" It even works for the lottery. Lidya's cousin, an ex-diver named Salim, won the lottery not once, but twice. When asked for his secret Lidya interrupted, laughing: "That's his fortune—because he plays every day!" Afterall, you can't win if you don't play. That is, rejeki offers an idiom through which to understand the confluence of luck, blessing, and opportunity. Rejeki might help put the fish in your net—but you still need to be ready to haul it in.

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Despite its origins in an Islamic theology, rejeki's purchase is in no way limited to Muslim-identifying people. Hence you have Meratus Dayak shamans expressing the work of their livelihoods as searching for fortune, "rajaki,"—a state that unites them in cross-cultural connection with their Muslim Banjar neighbors (Tsing 1993). Indeed in Southeast Sulawesi, the language of rejeki is often used to express similarities across differences; hence people would say of outsiders from other groups they might encounter at sea—

"we're all just here searching for our fortune." Indeed, it is this same formulation that makes up the ways of asking permission from the spirits who guard forests and reefs.

The spirits are not static and timeless, but historical and cosmopolitan, hailing from diverse origins, often in possession of their own civilizations, and who pursue fortune for their own culturally specific reasons. The spirits—whoever they may be—are not just capriciously and jealously guarding the wealth of the sea: they too are searching for rejeki. In this way divers and others express an identification not just with groups from distant places, but with the spirits; the pursuit of rejeki is a common state, an identity even, that forms a link of understanding across difference.

This point was summed up in a story that I heard multiple times during my research, about a city of djinn in Central Sulawesi. I first heard the story from Imran, as he was telling me about a time that he became gravely injured and nearly died from a diving accident—an accident caused by him mistakenly taking a coral that belonged to a sea guardian spirit. He was eventually healed by a Christian priest skilled in magic in a place called "Kebun Kopi," near Palu in Central Sulawesi. In Kebun Kopi, there is the largest city in the world, an invisible city, a city of djinn, called Kota Wentira, Wentira City, where they have every kind of money in the world in vast sums.

Imran heard the story from a friend, and that friend had a friend who studied at a university in Jakarta—a Chinese Indonesian guy who had a friend and classmate from Central Sulawesi. One day the Sulawesi Friend, embarrassed, asked if he could borrow some money—a large sum of IDR 10 million. He invited the Chinese Indonesian friend to come visit him in his hometown of Wentira, where he would pay him back. But when the Friend arrived at the Palu airport, all of the taxi drivers were struck with fear at his story and request to be driven to a sacred place at the top of a tall mountain in the middle of nowhere in the forest. So the Chinese Student rented a car and drove there by himself, where he found a beautiful city. His friend met him and paid him back all his money plus a generous

amount of interest for helping him.[30] The student, by behaving kindly to his friend in need, despite their differences, was rewarded with a rare vision and unexpected generosity in return: a gift of good fortune. Imran's conclusion to this story was to note that djinn are diligent and hardworking; there are many of them studying at universities around Indonesia, pursuing knowledge and chasing their own fortunes.[31] In other words, they are just like us. We are all the same—just all here looking for our fortune.

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One evening, Imran told me another story to try to explain how rejeki works. He began by saying that fortune often comes in nines. [32] A man he knew in Langgara, in Wawonii, a Bajo man, was walking on the beach behind the mosque in the evening after prayers, when he saw a great sailing ship offshore, and heard the sounds of war drums. He went closer to look, but as he approached, the ship transformed into a shell, a beautiful, radiant oyster, and inside the oyster were 9 perfect pearls. He was wearing a sorban selendang—the Islamic shawl—so he used it to carefully wrap up the shell and bring it home, placing it in a bucket of clean hulled rice. He left a 10,000 rupiah note with the bundle, and when he returned, the cash had multiplied. That was the origin of his wealth. Now he is one of the richest men on the island, having taken his surprise windfall and multiplied it many times. Many people have tried to buy the pearls from him over the years, but he has refused to sell. Since then he has gone on hajj, and now owns, among other ventures, the giant wooden passenger boats that ferry back and forth between Kendari and Wawonii, from which he derives great profit.

"That's how rejeki works Joe." Don't over think it. Don't ask for an explanation. Just be ready, recognize the signs, and then act. And know that while your fortune might come as beating drums and magic pearls, other times it may come as a bomb, or as a "rainbow donut" or "mushroom balloon," glimmering iridescent from the bottom of a murky reef.

CHAPTER ONE
The Hand that Picks Coral

On May 3rd, 2018, the coral world changed forever. That morning I woke up late. When not in Nambowatu, I was staying in a dusty room above a print shop near the university in Kendari; the only window had been covered by a billboard, and so the room was dark, and exhausted from a day at sea, I had fallen asleep without charging my phone—so no alarm. I frantically rushed out the door, knowing that I would be late to the "sizing" of the corals that the team had just brought back from a week of intensive diving, when their boss would evaluate each of the specimens, assign it a "size," and name his price. It was a formality with no room for negotiation.

Since my first meeting with Imran and the crew of the *Two Sons* in January, I had been spending much of my time in Nambowatu, living in Imran's house and going to sea with them. However, the start of the coral season, which usually began in late January or early February, had been long delayed by unknown bureaucratic issues. Indeed, coral has a "season" which is purely regulatory. Unlike "salmon season" or "deer season" which reference biological reproductive cycles, coral season is just about the reproduction of paperwork. While we waited for the right forms of paperwork and permission to "emerge" from the black-box of the state, we collected ornamental fish (those with better connected bosses were rumored to have gotten a jump-start on the season—a risk that most of the smaller scale divers in Nambowatu were not willing to take). Coral collecting finally got underway again in March, and I had spent the past weeks with the crew as they plied the waters around Moramo Bay gathering up spectacular corals.

The day before, we had all sailed into Kendari triumphantly with a huge delivery for Imran's boss, Pak Rajin. I helped the crew unload the corals from the white styrofoam coolers and gently place them into the cement holding tanks of the warehouse that sat

along the coast on the northern edge of the city. I decided to head to my rented room to get an early start on writing up my notes, and promised to come back early to watch the formal transaction part of the delivery where the corals would be assessed and the divers paid.

When I finally arrived after a rushed motorbike ride across town, I found the divers sitting around smoking and having coffee—but the air was noticeably tense. At first, I thought it was me—that I had overstepped my bounds with Pak Rajin by showing up alongside the team and observing. But it turns out that the frustration had nothing to do with me, and everything to do with big changes afoot in the coral world.

Indeed, that morning Pak Rajin had gotten a troubling phone call from his counterpart in Makassar. Apparently there had been some kind of decree from the Ministry of Fisheries, straight from the mouth of "Mentri Susi," referring to Susi Pudjiastuti, the erstwhile Fisheries Minister. The decree had said that all the coral companies located in Makassar and Bima were forbidden from shipping any more corals at the moment, a freeze. Nobody knew if it was temporary or permanent. Kendari, he said, remained free—for now. But before long, Imran's boss came along, and he called Imran into the side room to speak. When they came back, he told us that it seemed as if the ban would be in place for all of Indonesia, not just for Makassar and Bima, thus including Kendari—though this wasn't yet official. The bosses of all the coral companies were having an emergency meeting in Jakarta to figure out what was happening. We were all instructed by Rajin not to say anything to anyone in Kendari—though it didn't take long for word to spread through the backchannels, group chats, and social media accounts that connected the coral world.

Indeed, the rumor mills churned madly in the coming days as divers, bosses, and reef hobbyists all speculated about the causes for the sudden closure. Word travelled fast enough that popular aquarium industry news website *Reef Builders* published a post within hours that said (misleadingly) "There is NO ban on Indonesian Corals."[33] The reality was that this decision *was* indeed a de facto "ban," or rather, an administrative move that had

an equivalent effect of an outright ban. Still, that morning in 2018, none of us would have guessed that the coral stoppage would last for over two years—we all assumed it would be over in a matter of weeks, a few months at worst.

That same day I got in touch with contacts in the coral trade world and was plugged into a swirling network of impromptu discussions and panicked group chats where concerned bosses were circulating photos of the letters they had received from their local fisheries offices informing them that no shipments would be processed until further notice. The commonly told story was that government overseers had concerns about the sustainability of the industry—including fears of laundering happening between maricultured coral and wild collected coral. While these fears were not unfounded, they don't tell the whole story.

Legally speaking, Minister Susi had ordered the local quarantine offices to stop issuing "Certificates of Health" for coral shipments. Although at the time Fisheries wasn't involved in the official permitting process for coral, they did manage to insert themselves into the process of shipment of corals by requiring that all shipments be inspected by the local fisheries quarantine office. These shipments could not legally move forward without clearance from the local quarantine offices, which are squarely under the control of the Fisheries Ministry. Through simple fiat, Susi halted the entire aquarium industry. An important but often overlooked angle into understanding the ban had to do with internal power struggles among different ministries in the Indonesian government—and more specifically, about the relatively young Ministry of Fisheries seeking to exercise and stretch its authority.

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This chapter examines the political economy of the live coral trade and traces the winding journey corals take en route to becoming commodities. It follows the bureaucratic life of a coral after it leaves the reef, and the forms of corporate and bureaucratic magic that turn it

from a living creature into a state sponsored commodity and the object of desire for aquarium hobbyists. In telling this story, this chapter also explores the kinds of non-diving labor that animate the live coral supply chain, and examines the divergent patterns of citizenship that separate a political-commercial elite from ordinary workers whose bodies keep the commodities flowing.

I have come to think about the political economy of the live coral trade as an economy of permission. Permission is a particular manifestation of power; power demonstrates and reproduces itself by variably granting and/or withholding permission from supplicants. The administrative fiat that closed the coral trade makes this obvious. But even in normal times, it is made clear by tracing the movement of a coral from a reef to an aquarium tank in the global north—to do this successfully requires the navigation of a bewilderingly diverse number of different claims to authority which insert themselves at various stages along the supply chain. In many, or even most cases these transactions of permission involve paper.

Indeed, it takes a lot of paper to turn a coral into a commodity. A wild collecting permit, yes, but also separate permits to do business from three ministries, a permit to hire staff, a permit to operate a boat, the permit to transport within the country, a permit to transport outside the country, an annual harvest quota permit, and the certificate of quarantine—to name just some of the bare minimum state issued permits that get a coral from a reef to the edge of Indonesian sovereignty.

This doesn't yet include the forms of *informal* permission that keep the corals flowing as bureaucrats at each step seek their own sliver of pie, and as non-state actors assert their own claims to authority of various kinds. Despite having a thick stack of permits—all in order—while at sea Imran always carries another thick stack: a wad of small bills to stuff an envelope when he is inevitably stopped by the many different kinds of cops with boats: the city water police, the regency water police, the coast guard, customs

enforcement—even search and rescue. You might also need permission from the village where you are diving, and you always, always need permission from the invisible spirits who guard the reef.

The jockeying of these different forms of permission constitutes the political economy of coral in Indonesia. This chapter focusses in particular on the forms of "official" state permissions needed to commodify coral—and these official forms are constructed by means of paperwork.

A piece of paper with the appropriate stamps, signatures, and letterhead is not symbolic of state permission—but rather the paper *is* the permission itself. To move coral along the supply chain, you need to collect and maintain these different pieces of paper which together can be added together to generate the effect of licit commodification. Lose just one, and the whole thing comes to a standstill. The permission dissolves—at least until the paper can be recovered or reproduced, and the permission made whole again.

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As commodities, corals occupy something of a paradox. Despite being valued for their unique, idiosyncratic qualities, they are commodities in the thick sense of being at least partially fungible as inventory—at least within different commodity sub-groups. Thus, like a shipment of apples or rice, where every grain or fruit is theoretically interchangeable with any other, corals are not tracked individually with codes or identifying markers: they are shipped as "10 *Acropora spp.,"* or "*100 Euphyllia glabrescens*." This sets coral apart from other kinds of commercially traded wildlife like mammals or birds, which are often assigned names or specific identification numbers which center the individuality and uniqueness of the specimen in question, and are done so with the intention of perfect traceability. By contrast, the fungibility of coral, its interchangeability, creates room for creative or selective accounting, as we will see.

Critical here are questions of commodity categories—the buckets of interchangeability into which corals are sorted. Some of these commodity categories are dictated directly by the state. For instance—the state has a particular list of species which are approved for coral trading. It does not matter that many of these species names are regularly made obsolete by advancements in coral taxonomy (see chapter 4). Coral traders have a fixed list to work with, and in some cases the slotting of corals into these species categories are understood by all involved to require some loose equivocations.

Other commodity categories are invented by the industry. These include differentiations, for instance, between "small, medium, and large" corals, or between "regular" corals and what the industry workers call "super." Different color morphs of specific species, which sometimes correspond to geographic provenance, can also create commodity categories. The work of sorting and classifying corals into these different categories, and the ways that categories are constructed and operationalized across the supply chain is central to the regimes of value that operate in the live coral trade—and it is repeated at various stages where performative acts of selection, sorting, choosing, "picking," and "sizing" inscribe a living coral as this or that kind of commodity (cf. Tsing 2013).

Indeed, to return to that morning of May 3rd, I had arrived too late to watch the "sizing" of the corals, which is when Pak Rajin would go through each individual coral and assign it a "size" category. In theory the triangulation between a coral's size, its species, and its more enigmatic aesthetic qualities would produce its exchange value figured in Indonesian Rupiah. I had witnessed this process at other times and in other places—and was as mystified as the first time I had watched a livestock auction at a state fair in the Midwest. A boss would reach into the cooler or tank holding the corals, pull out a specimen, glance at it briefly and then utter the price: "15, 25, 10, 5, 50, 30, 5, 5, 5."

Figure 5 (top): Unloading coral | Figure 6 (bottom): Picking corals with a blue flashlight

A few days before we had sailed back to Kendari, Imran and Fahad, the "second diver" on the *Two Sons* were complaining to me about how stingy Pak Rajin was with his pricing—unlike many other more generous bosses. Fahad jokingly began imitating Pak Rajin doing the "sizing": pretending to pick up and examine one coral after another before setting it aside: "3 ribu, 3 ribu, 3ribu," (meaning 3,000 rupiah, or about 25 cents US) which were the real, very paltry prices that Rajin had recently paid them for a set of stunning green and purple *Euphylia glabrescens* that they argued were worth much, much more. Other companies, they told me, paid their collectors better prices for what they considered "barang super," or "super goods", and these companies—especially two which had been founded by former coral divers themselves—valued getting diverse corals with unique colors, not just ones which looked colorful on the surface, but those whose color might only emerge under the artificial lights of an aquarium, or while immersed in water. Their buyers know value, know prices, and they always carry a blue-light torch with them to see what the color will look like in the aquariums. Rajin does not—and is bent on paying the least he can.

In turn, the divers are in a bind: although they are in many ways treated as free agents and independent contractors for purposes of compensation and expenses, they lack the freedom that usually comes with that affiliation, because they themselves do not hold the permits to collect corals. Instead, that permit is held by their boss. Should they choose to leave, they are out of luck, unable to legally collect coral at least until the next season, and assuming they could find another company to work for. They are bound to the supply chain by the architecture of permission.

Yesterday's sizing wasn't quite as bad, but still disappointing. As always, there's no negotiating—the prices are just handed down. Then tomorrow they'll get paid. Annoyingly, Fahad told me, they didn't buy many of they corals they brought, including most of the mushroom (I: jamur) corals that they had searched so hard to find, even those with

incredible colors. But still, he said, it was better than nothing—and it was a really good thing that they had come into town when they did.

Indeed, the timing was precarious: the team had spent weeks filling this order that had come from upstream in the company supply chain, gathering corals that fit a specific description. They had brought the corals into the warehouse that Wednesday, and they were due to be shipped out on Saturday. Thank goodness they had managed to complete their end of the transaction, and that the "sizing" had been done just before the bad news reached them. If they had been even a day later, that might not have happened. The irony! Imran's boss delayed us coming back into Kendari several days, first because of an obscure religious holiday, then because he decided to ask for more of a specific kind of coral for a special buyer. If he hadn't delayed, the shipment could possibly already have gone. But now it was too late.

Imran wasn't worried. He owned his own boat, so could find other jobs to keep busy. Others, however, were not so lucky. Most didn't own their own boats or diving equipment, and few had the skill to gather ornamental fish like he could. Imran shook his head; he was worried for the divers at the other companies—his family and friends—who had nothing, no equipment of their own, and no special knowledge. If they were out of work, then they were out of work.

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Before proceeding further to examine the supply chain, it's worth it to spend a few minutes thinking about the forms of inequality that structure the supply chain within Indonesia, especially the divides between bosses and their workers, including both divers and the different warehouse workers who keep the coral moving.

Over time I concluded that the only thing that differentiated the bosses was their ability to whisper to the bureaucracy and to generate the forms of paper and permission needed to be in business. It's one thing to be able to propitiate a sea spirit to let you collect

corals, but it is entirely another to stare the state in the teeth and demand dozens of forms of permission.

This proliferation of different forms of state permission required to commodify coral tells us something about the multiplicity of the Indonesian state itself. The Indonesian state has often been portrayed as a monolith. This was more or less accepted as matter of fact during the years of Suharto's New Order regime where the utter consolidation and centralization of power was a specific feature of oligarchy. But in the decades since the onset of the reformation era, the Indonesian state has been redefined as a site of contestation and power struggle. Indeed, the counterintuitive outcome of the "decentralization" and "reformation" movements of the 21st century has been not to eradicate state corruption, but to democratize it; as power has become more widely distributed, so too have opportunities for treating the state as a vehicle for personal enrichment (Hadiz 2010).

Freed from the grip of the singular authoritarian head, the state itself is shown to be a figure of multiplicity, and the terrain of power struggles as different state agencies promote their own agendas, try to increase their importance and relevance, claim their inch of power, and reproduce themselves. Power is widely distributed across the various agencies of the state, and no singular actor has the ability to dictate a particular outcome. As agency personnel shift and change, the definition of an efficacious businessperson or entrepreneur has become someone with the right kinds of social, cultural, and economic capital who can successfully navigate this new and diverse state and wrangle from it various favors and forms of permission. Unsurprisingly, this definition and the questions of its uneven citizenship begin to resemble the reality of political economies in the United States.

The division between bosses and their workers emblemizes the kinds of uneven patterns of citizenship that divides ordinary Indonesians from ruling elites. The work of Pujo Semedi and Tania Li (2021) on plantation life in Kalimantan is particularly instructive

here for thinking through uneven forms of citizenship. Li and Semedi argue that plantations and other forms of "corporate occupation" are able to trample on the rights of ordinary people because of a colonially inherited bifurcation of citizenship that operates in a quasi-racial manner. Political efficacy is reserved for those of the well-connected ruling elite. Mobility across this barrier is not impossible, but it is very difficult. It often involves the landing of a government job; once inside, you can crank the door open for your family members to follow. Indeed, families would invest money in advancing their young people towards government jobs as a form of insurance or security—by installing kinfolk within the state apparatus, you carve out a form of protection for yourself, however meager.

In the coral world, the bosses are, with very few exceptions that prove the rule, from elite backgrounds. Many of them are hajis, some are descendants of various kinds of aristocracy, and almost all are highly educated. Workers, by contrast are from peasant or proletariat backgrounds. Most did not complete high school. In Southeast Sulawesi in particular, some were marked by belonging to the lowest rungs of the feudal caste system that still has major influence in the region.

Consider the story of one diver-turned-entrepreneur in Nambowatu. Hamzah was a cousin-in-law of Imran who started his own coral company. His brother got a scholarship and became a doctor in the city, and Hamzah was able to leverage his brother's success, connections, and newfound bureaucratic expertise to borrow money to start his coral business and get all his permits. But as Hamzah's example shows, his admission to this upper class is precarious; the 2018 coral closure slammed the door in his face. Those who can wrangle the permissions needed to turn coral into cash, who can whisper the magic words to the bureaucrats to fork over the paper, are the winners in this story.

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In the rest of this chapter, I tell my own journey of moving backwards along the supply chain, while also considering these economies of permission along the way. This story also

conveniently maps onto the chronology of my own early fieldwork—moving from Jakarta to Makassar to Kendari to Nambowatu. I begin in Jakarta, with an examination of the legal and policy structure of the coral trade, and a visit to the offices of the national coral trade lobby group. From there my next destination was the city of Makassar in South Sulawesi, where I first thought I would conduct research, and where I spent time inside a coral exporting company while I tried to find a way to meet with actual coral divers. When things in Makassar didn't pan out, and on the advice of trusted colleagues, I moved to Kendari where I eventually found my way to Nambowatu and aboard the *Two Sons*, as well as into a local fisheries quarantine office. Along the way we see the messiness of policy on the ground and the ways that power and capital mingle and mix in flows of extracted commodities.

Jakarta: AKKII and CITES

The primary body of paper governing the live coral trade—and the licit trade in most living beings—is CITES, or the Convention on the International Trade in Endangered Species. CITES is a multilateral legal institution launched in 1973, designed to address the growing international trade in endangered species, and part of a flurry of midcentury interest and concern for rapidly declining wildlife populations. The convention had two primary goals—to stop the international trading of the most endangered species, and to monitor and track the trade of other species that might be vulnerable to trade. Indonesia was not a founding member of CITES, but joined soon after, becoming a member in 1978.

CITES works through a system of three "Appendices," which are simply lists of species grouped together by the limitations placed on their trading. Appendix I includes about 1200 endangered species for which trade is all but totally banned—animals like tigers, great apes, rhinos, and other endangered species. Trade is typically only permitted for these species if they can be shown to have been bred in captivity (see Netflix's *Tiger King*), or for exceptional non-commercial cases (usually conservation or scientific research). Appendix II, by contrast, includes 22,000 species, mostly taxa of significant interest and

volume in terms of trade. These are species which are not necessarily currently threatened, but which are in such demand that endangerment through over exploitation is possible or even likely without regulation. In its own words, CITES describes Appendix II regulations as intended to "to avoid utilization incompatible with [species] survival." Here, CITES oversight is intended to be a preventative measure to avoid the species being traded into extinction. Appendix II, however, is far more open ended, and the degree of regulatory control over what types and volume of trade are allowed is more or less up to each individual country to decide. The bulk of the work of CITES concerns Appendices I and II, which are binding on all member states; species can be added or removed to these Appendices by a two-thirds majority of votes during the biennial Conference of Parties. Appendix III species are species included by one member state, and other states may voluntarily choose to cooperate in preventing trade.

Indonesia has long been the center of the coral industry—ever since the 1990s when the techniques and technologies of reef keeping became advanced enough to keep living corals alive in captivity.[34] The first corals were added to CITES Appendix II in 1985 (CITES 1985); the inclusion was proposed by Australia and included 14 species of stony corals. Harriot (2001) points out that the early inclusion of corals in CITES had little to do with the aquarium trade as we know it today; instead at the time, in Australia nearly all of the coral was collected to sell the dead skeletons on the souvenir and curio market, as well as a smaller subset to be used as decoration in aquariums. However, the inclusion may also have been related to a 1985 study conducted by the Australian government auditing its own nascent and very tiny domestic live coral industry. Perhaps it is not a coincidence that it also came on the heels of the 1982-1983 El Nino event that brought drought, fire, and mass coral bleaching to Australia's Great Barrier Reef, causing alarm among reef biologists. Today there are many dozens of species of coral listed in appendix II of CITES.

Most countries in the world are party to CITES, however each country is essentially free to implement the treaty on their own terms and through their own legislation. Entire books have been written on the subject of just Indonesia's implementation of CITES (Soehartono and Mardiastuti 2003) but allow me to try to summarize briefly.

Each member country of CITES chooses an agency within the government to designate as the "Management Authority," and another to operate as the "Scientific Authority." The premise is that the "Scientific Authority" will sponsor, conduct, and coordinate research into the country's flora and fauna and establish an encyclopedic understanding of all species that may be considered endangered. Based on this data, the Scientific Authority makes recommendations for "sustainable" exploitation of the species in question. Then, relying on this data, the "Management Authority" determines how to implement the recommendations of the Scientific Authority. In its implementation, Indonesia designated the Indonesian Institute of Sciences (LIPI) as the "Scientific Authority," and the Ministry of Forestry as the "Management Authority." Indonesia also chose to establish a quota system for its implementation of CITES—a system not universally used for a variety of reasons (some of which we will discuss below).

Keeping track of every species within your borders is of course a Sisyphean task for any government, let alone for one whose territories are home to among the world's greatest biodiversity as is the case for Indonesia. The fact is doubly true for marine species for which little to no baseline data exists—and where in many cases even basic questions of distribution, population size, and taxonomy are not settled. So, in practice, LIPI focuses energy on the Venn diagram overlap of species listed in Appendix II *and* for which there is commercial interest.

In purely abstract terms, the process for regulating wildlife trade in Indonesia should theoretically go like this: LIPI, as the scientific authority, coordinates and collects data on the population status of all of the Appendix II species within the country. Using

this population data and historical data collected from each province where wild collection is permitted, LIPI recommends an annual "harvest quota" for each species in each province in question, and then passes these numbers along to the Ministry of Forestry who are tasked with allocating the quotas to those who are doing the harvesting and trading.

The reality of the situation is somewhat different. Like many public research institutions around the world, LIPI is severely underfunded and understaffed in comparison with the kind of scientific heavy lifting they are asked to do—such as determining population levels for nearly 100 species of coral across 11 provinces on an annual basis. LIPI *does* conduct annual surveys in each province in partnership with local researchers and university staff—a process called "Reef Health Monitoring" or RHM. However at least in Kendari, these surveys began only in 2016—years *after* Indonesia's annual exports had peaked into the millions of corals each year. These real limitations are exemplified in the methods that are used in this process—namely annual surveys done along fixed transect lines across the province. While the data one can glean about reef health from such annual surveys are critically important, they are less useful in determining the sustainability of a coral fishery; as long as divers avoid collecting directly on the fixed transect lines, their activities would likely be completely undetectable by this method.

And so, the development of annual quota figures relies heavily on factors other than the actual population status of the coral species in each province. The decisions involve business considerations perhaps above all else. Like other wildlife trade sectors in Indonesia, quota numbers are often established by reliance on previous years' numbers. Last year we collected X corals, as we did the year before that, so X must be a sustainable harvest number. In fact, at least prior to 2018, the negotiations about how to set this figure were typically a collaborative event involving LIPI, the Forestry ministry, and representatives of the major coral lobby group, which lobbied aggressively for annual *increases* in export figures in order to satisfy their member companies appetites for growth.

This kind of government-industry partnership is the standard operating procedure for wildlife trade quota figures in Indonesia.

Here it is important to explore this trade lobby group and the corporate forms which are created by the way that the wildlife trade is governed in Indonesia. This is an important point: the regulatory structure literally demands the creation of a hierarchical corporate structure. In other words, the shape of the corporation is molded to fit the visions and capacities (or lack thereof) of the state. These wildlife trade lobby groups are central to understanding not only the coral trade, but all wildlife economies—and they also reflect common practice in designing the interface between the state and corporations.

Indeed, before stumbling across the coral project, I had been looking into the Indonesian reptile skin industry supplying luxury fashion companies around the world. As part of my research, I was put in touch with a man who himself used to be in the business, and better still, a man who used to be the chair of a trade group representing every reptile skin business in the country—a group called "IRATA" or the Indonesian Reptile and Amphibian Trade Association. At the time I didn't think much of the organization; I was just interested in learning as much as possible about the snakes and crocodiles being traded. When I later became interested in coral, and realized that there was a trade group for that as well, it was this ex-snake skin trader who put me in touch with a group called AKKII—the Asosiasi Koral, Kerang, dan Ikan Hias Indonesia, or the Indonesian Association for Ornamental Coral, Shells, and Fish.

In these early days I saw these trade groups primarily as sources of information and as networks through which I could connect with workers and divers in the coral trade. Only later would I realize the central role played by these groups in organizing and governing the coral trade, and in liaising with the government. Trade groups, I came to realize, were a permeable membrane across which corporations and the state mingled and spoke to each other. As "official channels" they also served as a firewall—creating a benignly appearing

legalistic form that helped to shield either government officials or businessmen from appearances of impropriety.

As in the United States, trade groups in Indonesia wield enormous financial and political power. Of course, by comparison to many groups, AKKII is small potatoes. But even so, it provides a window into a political economy in which state and capital mingle and constitute one another—and this is a pattern in no way unique to Indonesia. The most obvious example are the kinds of "Chambers of Commerce" through which bosses organize at every political level, both here in the United States and around the world. In his classic study of state and capital in Indonesia during the New Order, Robison (1986) notes that "the political activities of businessmen were consolidated into Kadin (Kamar Dagang dan Industri - Chamber of Trade and Industry), a business association which enjoyed considerable government sponsorship and finance, and which became, in effect, the major channel of communication and negotiation between the business community and the state" (Robison 1986: 324-325; see also Ford 1999).

I first visited AKKII in 2016 while doing preliminary research for this dissertation. The office was technically not in Jakarta but in Bekasi, a neighboring city that makes up the "-Bek" in the greater Jakarta metro abbreviation "JaBoDeTaBek." The office was tucked away in a housing development, and much less grand than I had envisioned. I was surprised to find a very small office taking up just one floor of a building outside an exotically named housing complex. I wondered to myself if this difficult to reach location was intentional; close enough to facilitate access to power and an airport, but deep enough in the boonies that no government official would bother making the trek.

This was my first introduction to the coral trade world, and for whatever reason, I expected a larger, more glossy facility showing off industry glitz. Instead, the office was just a small front reception room with simple furnishings while the rest of the office consisted of an open floor with a few desks, and another office in the back. There

were maybe 4 other people working there, none of whom was the chair with whom I had been originally put in touch. I never did meet that man. Instead, the bulk of the daily grunt work was done by a small secretarial staff and a few administrators.

One of the staff members, Pak Wahyu, himself a technically savvy scientist, walked me through the organizations operations and gave me a high-level overview of the live coral trade as he understood it. He began by telling me about a series of workshops by the US National Oceanic and Atmospheric Administration in 2010 and 2011 to address "traceability" in the coral trade. He said that the US Americans were "shocked" to see the robust and comprehensive regulations in place; he made a gesture with his fingers as if indicating a very thick book or stack of papers. Wahyu suggested that Indonesia's laws were among the most comprehensive for any animal trade in the region. In fact, they are so robust, that Malaysia and other countries have adopted Indonesian policy frameworks. He was, of course, correct in this regard. But what about when these regulations touch down in real life?

Wahyu walked me through the basics: First the "Management Authority" (aka the Ministry of Forestry) asks the "Scientific Authority" (aka LIPI) for recommendations for quota assignments, and then sets quotas—ostensibly based on robust population data. Regarding LIPI, Wahyu echoed concerns that they were understaffed and underfunded. They maybe have 10 people working on coral, a few of whom are experts and others who are not—and most if not all also focus on other taxa. Accordingly, he said, LIPI often leans heavily on a consortium called Indonesian Coral Working Group made up of industry, government, and NGOs which meets every so often, and is involved with LIPI in ongoing audits of coral mariculture. Wahyu did not mention the role played by AKKII in advocating for annual increases in quota figures, nor the working assumption that if the quota has been increasing for years with no obvious issues, then small annual increases would continue—population surveys be damned.

Once the quotas are established, AKKII then distributes the quota among its members. The member companies have to submit requests to local BKSDA offices ("Konservasi Sumber Daya Alam," "Office of Natural Resource Conservation," a subsidiary agency of the Environment Ministry) describing what corals they want to collect, how many, and where. Then the BKSDA office issues permission and relays the request information back to AKKII, and they can cross reference the requests with the allotted quotas they set. He called this "matching." He had confidence in this system, but I can easily imagine a variety of ways it could be compromised given the dependence it has on local BKSDA offices. In terms of permitting, Wahyu told me the ideal process is that companies seek permits for transit and export *after* they have collected, but often times this takes weeks or months to arrange. So, in practice, most members arrange the papers first and then collect the corals afterwards so they don't spend too long in transit or holding facilities where the mortality rate can be very high.

I asked him if he thought it would be possible for an exporter to get permission from a KSDA office in one place, and then actually collect the coral somewhere else and pass it off. He emphatically didn't think this could happen, for an interesting reason: He argued that people involved in the trade, the exporters and the traders really were able to identify corals within a genus by their "characteristics," including color, morphology, basal morphology, and so on. He argued that many corals possess strongly local characteristics which make them locally unique. While there is certainly some truth to the assertion that different regions have striking patterns in coral distribution, and indeed some morphs are more or less only found in certain places, the other part—that the regulators are able to accurately identify corals—is very often not true, as I later found out.

AKKII offers a puzzle. Its existence is mandated by government directive, and it serves as both gatekeeper to the industry and liaison with the regulatory system. Indeed, given its role in distributing quotas, AKKII seems to operate as *part* of the regulatory

apparatus itself. And because AKKII is central to the distribution of quotas, without membership in AKKII, aspiring coral traders have no access to the industry. Yet AKKII is coextensive with its members—who are all private businesses. In all these ways, AKKII becomes a central party to its own regulation and management—and begins to blur the lines between government and industry.

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Perhaps it will not surprise you that much of what I was told at AKKII did not travel well beyond the walls of offices and the thick stacks of legal regulations. Wahyu knew the policy and the law inside and out, and was able to cogently explain how things worked in theory—but it doesn't take much digging to puncture the balloon of legal optimism. Examining the "quota" system used to govern the coral trade helps to illustrate. In theory, any ordinary person should be able to get a permit to collect Appendix II wildlife, and to be issued a harvest quota, and then legally able to sell these animals to a licensed exporter. However, in reality, the "harvest quota" is actually an "export quota"—the two are treated as functionally the same. Indeed, the only time that the state ever inspects or comes into contact with the physical corals is during shipment: all the corals are required to be inspected by the local fisheries office prior to shipment, and it is during this inspection that quota figures are checked. A hypothetical example might help.

Imagine that your company is issued a quota of 1000 Acropora corals. In theory this quota is your "harvest quota," and you are only allowed to collect 1000 wild specimens during the season. However, the tally against your quota is only kept when you ship the corals and they undergo inspection and quarantine. That is, the paper trail for the coral begins only once it is packed for shipment. So, while you might collect exactly your budget of 1000 corals, perhaps a few of them die in captivity, and perhaps a few of them turn out to be ugly and nobody wants to buy them. In the end, while you harvested 1000 corals, you

only ship 700—so only 700 are passed through the inspection and quarantine process. As far as the state is concerned, you have only used 70% of your quota.

Now imagine that you are an upstanding yet naïve citizen who believes strongly in abiding by the rules, and you decline to collect any more coral. Perversely, the following year you are almost guaranteed to have your quota cut for failure to fully utilize it. Instead, what a savvy traders does is go out and collects 500 more corals, choosing the 300 best ones to sell, in order to use up the remaining "quota." Your original "harvest" quota was 1000, but you actually harvested 1500—you have now collected 50% over your original allocation, but in the eyes of the government you have met it exactly. This is how the coral trade—and every other wildlife economy—works in Indonesia. The result is that companies *vastly* over collect, and then select the best of the best corals to count against their official quotas, and they are careful never to let any of their quota go unused, lest they be punished the following year. This outcome is structurally baked into the quota and permitting model used in Indonesian wildlife economies.

This system also structurally disadvantages coral divers. As part of the permitting system, each company lists the names of its coral collectors—the ones actually doing the work. Because of this, each collector, each diver, is tied to a specific company, and is given permits to collect only at the grace of their boss. Each diver is only allowed to work for one company—meaning that the divers are locked into a relationship with a specific boss each season. Structurally this puts the divers in a very vulnerable legal situation where the boss could terminate their relationship at any moment. The relationship suits the bosses well because without the fear of competition they are able to dictate prices paid for the corals brought to them by their teams—recall the "sizing" earlier in this chapter. And yet the bosses often treat their divers like independent contractors—as if they had the freedom to take their coral to any other company. But divers do not have this freedom; those suspected of double dealing—of going behind the backs of their boss and selling or working with

another company, are blacklisted, and locked out of the industry in a place where few livelihood alternatives exist.

Makassar: Troubled Permission

My visit to AKKII was deeply instructive, not least because I was put in touch with the chair of the *regional* trade group for the coral companies operating in South Sulawesi province. As it turns out, trade groups are fractal, reproducing themselves along the imagined scales of Indonesia's nested political hierarchy. AKKII laid claim to the nation—but did so through coalitions of smaller organizations organized at the level of the province. In South Sulawesi, this organization was called "AKIS" or the Asosiasi Koral dan Ikan Hias Sulawesi. Through AKIS, I was put in touch with a coral trader named Haji Faraz.

Haji Faraz was an eccentric man unbothered by contradictions. He had published research about the un-sustainability of the trade in ornamental fish and was a lecturer at a local public university. But he was also one of the major coral traders in Makassar. Because he was a public employee, he was legally not allowed to also own a private business—an ethical principle established after the end of the New Order regime with its wanton mixing of business and politics. And so, like all the other politician-slash-businessmen in the country, his coral company was in his wife's name—who I never met. He proudly showed me all the permits and documentation, pointing to her name across the top.

Despite his own research suggesting that many species of ornamental fish are overexploited and potentially at risk, he was eager to tell me that his company, CV. Kartika Laut, would be expanding into the ornamental fish business in the coming year. The lure, he explained, was that ornamental fish were, in his words, "non-CITES"—by which he meant that virtually none of the tropical aquarium fish widely collected and traded from Indonesia were included in any CITES appendix, and so trade was largely unregulated and unmonitored. And because inclusion in a CITES appendix is the primary way to mandate

research into the population status of a species, nobody was keeping track of which fish may be disappearing.

In this way Haji Faraz embodied the mingling of state and capital in a manner that mapped onto the structures of regulation in the coral industry. As publicly funded researcher, entrepreneur, and trade lobbyist, he was involved in both studying the sustainability of his own business, as well as involved in decisions about how to regulate his own business that were ostensibly based on his own research. This positioning was possible because of his class status as a middle-upper class elite with connections in all directions.

I first met Haji Faraz during a trip to Sulawesi in 2016. In late 2017, when I came back to begin longer term fieldwork, he remained my main contact in the Makassar coral world. I would spend whole days at his warehouse in the fisheries district of Makassar, not far from the old port of Paotere, waiting for him to show up for meetings that were eventually cancelled. In truth these lazy afternoons were a gift, and I happily passed the hours talking with Ali and Haris, Faraz's only two full time workers who handled the daily care and operations of the corals and guarded the warehouse. I learned the ins and outs of the trade from these two, and when we got trapped in the warehouse by heavy west monsoon rains, they would try their best to teach me words and phrases in Makassar. I once asked Ali what he liked about this job, working with coral; he shrugged before offering: "I like that it's close to my house."

When I finally got to talk to Haji Faraz in person again, in December 2017, he made a face and began by saying in English "Many, many problem." He laughed maniacally. "Problem from Makassar to Bali, no document." He told me that of AKIS's 10 members, 6 of the 10 had been caught in a shipping scandal earlier in the year, and only 4 were still "safe"—including his own company. The other 6 were at risk of having their licenses revoked and were suspended from operations pending the decision of the Management Authority. He said he wasn't sure about all 6, but at least two were guaranteed

to lose their permits after repeat violations. He said it even made it on TV over the summer. The six companies did not have SATDN – Surat Angkut Tumbuhan dan Satwa Liar Dalam Negeri ("Permit to Transport Plants and Wildlife Domestically"; the permit needed to ship corals within Indonesia). They tried to send corals to a buyer in Bali by hiding them in a roller bag on a regular commercial flight, and the guy carrying the corals got caught at the airport. I couldn't tell how Faraz really felt about all this. On the one hand, this was a blow to the reputation of the coral trade, particularly those in South Sulawesi. But on the other hand, it very well could have benefitted his company through vastly reduced competition. He even insinuated that he might get an increased quota—the leftovers from the companies driven out of business.

In Faraz's warehouse I began to understand how the legal structures of the live coral trade had created a lucrative corner for him as a classic middleman who did little but buy low and sell high, and use his connections and position to drum up capital and massage the permitting system. Faraz was from an elite family, and so had access to money—including his not insignificant university salary—to jumpstart a business. But more importantly, he was well connected scientifically, bureaucratically, politically, and therefore able to glide through the immense regulatory hurdles without issue. In other words, were it not for the onerous paperwork, Faraz and most other coral bosses would be irrelevant: his special skill was simply being able to get the right pieces of paper—the permits.

For example, Haji Faraz showed me a copy of his permit to collect corals, which also includes the quotas and a list of names of fishermen who collected corals for Faraz; these names were mostly preceded by "Haji," a title for those who had been on the Hajj pilgrimage to mecca. Haji is also a marker of class difference that indicated these men were not exactly fishermen, but rather local patron bosses known in South Sulawesi as "pungawa," who maintained crews of dependent and often indebted fishermen (called "sawi") who did the real work. The sawi were seen as pure abstract labor—interchangeable and replaceable, and

therefore their names never appeared on the permits. Ali explained that usually a company would advance capital or even advance payment to the collectors, creating a debt relation (sangkutan hutang, where the word for relation, or sangkutan, usually means "hook," as in the divers are on the bosses's hook). This debt relation is supposed to bind the collectors to the company exclusively. "If the fishermen take on debt elsewhere, and the company finds out," Ali explained, "they are angry." People rarely pay off the debts in full, so a debt relation remains, binding the supplier to the company. However, Ali's explanation perhaps hints at the unspoken truth of the matter—that problems arise only when the bosses find out.

The coral collecting permit also listed an elaborate number of specific places and regions associated with each fisherman, indicating where they were allowed to collect. The sites included vast areas that covered significant parts of the marine territory of South Sulawesi—on the order of hundreds of square miles or more. Yet while the company does technically have permission to collect in all listed sites, in reality the supply is more limited.

Indeed, the coral fishing networks in Pangkajene dan Kepulauan Regency (called "Pangkep" for short), which covers the islands spread across the strait of Makassar and south nearly to Bali, are organized out of only two islands: Barang Lompo and Karanrang. Fishermen from these two islands travel out to the collection sites, but do not stay or live on those sites. Unlike those after other marine products like tripang, who go out for weeks at a time, coral fishermen go out every day and come back to the same island, a necessity of keeping the coral alive. There they are kept in holding tanks on those two islands, and then eventually sold on to the supplier companies like Faraz's. These two islands constitute the vast majority of the coral supply in the Makassar region, as well as the majority of the company's total coral supply.

This was quietly devastating news for me, since I had hoped to get to work directly with coral divers. I had visited one of the islands, Barang Lompo, the year before. The island was tiny, and every inch of it was completely covered with houses. The beaches were piled

over a meter high with garbage. The reefs around the island had long since been utterly destroyed, leaving only sand and slime where coral cover was once extensive. I had hoped and prayed that there would be another spot that I could do research, though it seemed in Makassar, there was not. There was one team of coral divers that operated out of Makassar instead of from the small islands—everyone joked that they were "city fishermen," but they had a five person boat and a five person dive crew: no room for tag-a-longs like me.

Indeed, after a few weeks in Makassar my research opportunities were looking bleak. Faraz tried to insist that I should write my entire dissertation about his warehouse—but I decided it would be best to move on. But where to go? At the suggestion of colleagues I began to look again at the city of Kendari, on the opposite side of Sulawesi. I had preemptively included Southeast Sulawesi province in my research permit—though I had few leads there. That same evening, I sat on the floor of my room in Makassar, sipping coffee while thunderous rain spat against the roof. I was frantically hammering in various combinations of keywords into a search engine, desperate for any clues as to what to do next. It was then that an innocuous document suddenly opened in my browser: a report from the provincial government of Southeast Sulawesi for 2007, outlining the companies who had been issued collecting permits for live corals—and the locations they were permitted to collect. My heart raced; this was the sweetest an innocuous government document had ever made me feel.

I began sorting through the file for place names and adding them to a list, nesting them within their proper administrative hierarchies, and then plotting them on a map of the province. As I plotted, zooming in and out of satellite imagery of the Southeast Sulawesi coast, I couldn't help but be entrenched by its fractal complexity: instead of the long straight beaches around Makassar, Southeast Sulawesi coastlines were undulating, dotted by inlets and bays and estuaries and capes and peninsulas and mangroves. By the time I finished plotting, my little map had traced nearly the entire coast of Southeast Sulawesi

and most of its islands. Little stars glistened on the coasts—coral collecting sites everywhere. The next day I booked a flight, scheduled to arrive in Kendari just after new year 2018. The coral trade would be closed for all of January anyway, so I told myself that I would give Kendari a few weeks before deciding whether to stay, and just in case, I would pack my bags and take everything with me—and I never looked back.

The Ledger and Coral as Inventory

But before I left for Kendari, I had a few weeks left in Makassar to observe a working coral warehouse. My timing was accidentally fortuitous. The coral "season" begins in January or February with the announcement and distribution of the "quotas," and ends on December 31st each year when the quotas expire. This makes December an especially busy time—a mad rush to use up all remaining quota before the closing of the calendar year, at which point any remainder is forfeited. Any unshipped corals in the warehouse would have to wait until the new quotas were issued in February to be shipped, so both the coral collectors and Faraz are eager to move the inventory quickly—to liquidate as much stock as possible before the holiday season lull, to turn as many corals into cash as possible.

On December 15, 2017, two of Faraz's major suppliers arrived together—Haji Amir and Haji Taufik. Their arrival had been coordinated with an order from a downstream exporter—so that unloading, reloading, and shipment could all happen simultaneously—the ideal situation for coral exporters. It goes like this.

First, the staff do an inventory of what corals are already in the tanks, for a starting baseline. One person stands by with a large accounting ledger, while another goes around to each of the warehouse's dozen or so holding tanks, examining the current stock. The current inventory is recorded in a ledger—noting the species, color, size, and other details. This prepares the ground for an influx of new corals.

Second, the new corals are unpacked. Each collector arrives with several large styrofoam coolers full of corals, which are placed at opposite ends of the building for

unpacking—with care taken to make sure the supplies do not mix. Each coral is packed individually in a clear plastic baggie. Each box is unloaded into a pile of plastic bags, loosely mounded in a heap. The incoming shipments are unpacked, piece by piece, from the hundreds of plastic bags.

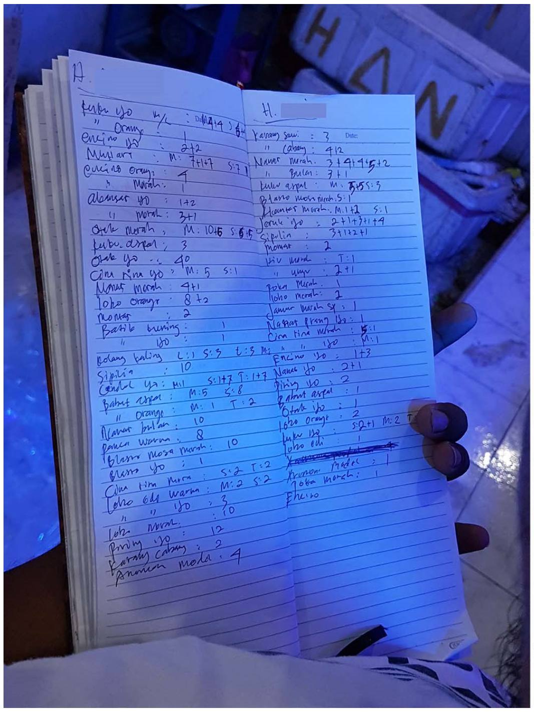
This is a messy, wet process. Sea water from the depths of the Strait of Makassar slips and spills across the floor of the work rooms. Grabbing a bulbous plastic baggie in my hands, I press both of my thumbs hard into the globe of water and pull apart; the tense plastic rips with a pop, and sea water spills across the floor of the work room. I gently place the coral into a shallow plastic basket. When full, the basket is set into one of the tanks; the baskets have been rigged with pieces of styrofoam so that they float on the surface of the tank, keeping the corals immersed in water, but separated—not yet general inventory.

As we sit ripping open the bags of coral, I am enthralled by the microcosms passing through my hands. Tiny invertebrates end up everywhere: in the tank or on the floors of the workrooms—brittle stars, miniature crustaceans, worms of all varieties, and more—and those are just the ones you can see easily. It is a holobiont bonanza (see Klein et al. 2022 for more). I was shocked at the coral mucus—I couldn't believe how slimy the corals were—slathered in a thick, snotty, gel substance, completely transparent, and surprisingly difficult to get off your hands. My picker friend claims that the mucus gets especially thick on corals which have some sort of injury, trauma, or disease—like blood flowing to a wound. Indeed, coral biologists have hypothesized that that coral mucus is part of the animals' immune system, a kind of slimy, good-bacteria rich firewall to trap and destroy incoming pathogens (Rivera-Ortega and Thome 2018). This mucus is also key to reef ecology: as corals slough it off into the water around them, filter feeders, especially sponges, suck it in for dinner, helping to keep nutrients in the local food web. Here in the warehouse, the mucus flies the coop. Workers touch the corals, then touch other corals, then the corals touch each other, and then they touch other corals again: mucus everywhere.

Next, third, the corals are sorted by type and size and placed into the large holding tanks. Only an expert can do this; amateurs often make mistakes in identification and quality. As they are being moved from the basket to the tank, the workers inspect them closely, looking for signs of disease, trauma, or parasites. A dull butter knife is used to scrape an orange "fungus" (actually an encrusting sponge) from in between the arms of a *Euphyllia* coral; the same knife repeats the process a moment later on a different coral with a greyish bluish sponge growing. "If we don't get rid of this now, it will keep growing and take over the coral." Finally, they are placed into the appropriate spot in the tank, sorted by species. Corals which are too sickly or damaged or unfit are tossed to the side of the workroom on the floor and later swept out with the trash. These are never counted in the "quota," and they are not recorded in the ledger; no paper trace is left of them, and as far as anyone is concerned, they never existed.

Finally, fourth, the ledger is fetched, and a new page of inventory begun for each Haji. The staff inspect each coral, shouting instructions as they go: they yell type, number, and size to the person writing the ledger: "tiga jeruk hijau s, satu m." Three "green lime" corals (genus *Goniopora)* size small, one size medium. The person holding the ledger records these as a long open-ended formula, adding to it as they go: "Jeruk ijo: 3 s + 1 m +1s +5m +..." and so on until all the corals are accounted for. This is the first moment that the coral is inscribed on paper. Here in the ledger, each coral is sorted, accounted for, and tallied—and its bureaucratic life begins.[35] Now they are inventory.

After we finish unpacking, we rest before we have to do the opposite: pack the corals up, including much of what we just unpacked. The timing is crucial: corals are packed at the last possible moment, because once they are sealed inside the bags, they begin to use up the oxygen through respiration. The flight taking these corals leaves the next day, so they will be packed in the evening, sent to the airport for inspection, and then shipped. We will begin at 5pm.



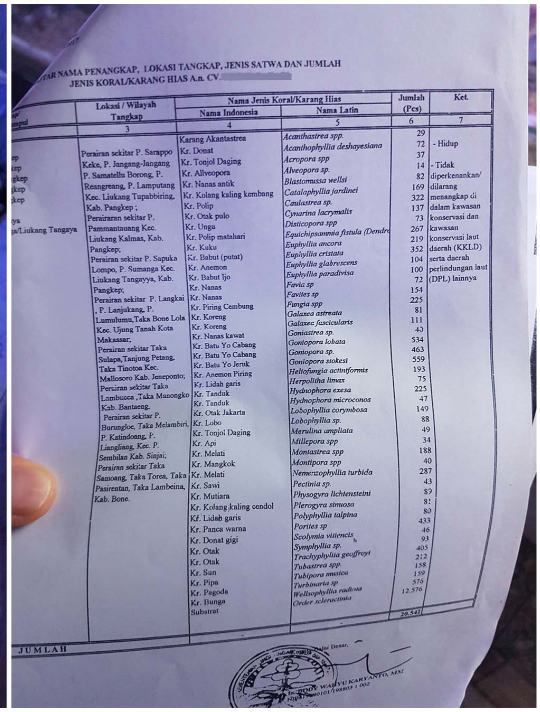


Figure 7 (left): The Ledger | Figure 8 (right): The Permit

The Hand that Picks Coral

Right at five, the work resumes. On nights like this, it is all-hands-on-deck. We have new friends here to help us, including Rafiq. Rafiq is a coral picker. He is the "eye" for coral buyers and suppliers in Makassar and beyond, with 20 years' experience handling coral directly. At first, I assumed he was some kind of employee of Faraz's, but this is not the case. Coral companies in Makassar frequently call him to help with packing because of his experience in choosing healthy corals from stocks, and pleasing buyers.

Rafiq is as freelance as they come. He got into the business when his brother-in-law got funding from a huge coral exporter—PT. Intan Biru Sejahtera—to start a branch in Makassar. The arrangement was that this relative would cultivate wild coral sources in Makassar and supply them to their headquarters. This worked for a while, but then the relative got caught selling "super" corals—the most prized, multicolored corals—to

competitor companies, and was sending "the leftovers" (I: barang sisa), the subpar remaining corals, to his boss. "He didn't want to stick to one Boss, and got caught," Rafiq told me. GMP pulled their funding and the business went bankrupt. The story is a reminder of the extremely high value placed on loyalty within the coral world.

After this, Rafiq went to work for one of the companies busted recently for illegal shipments of coral. Rafiq had even spent time working directly with divers, and in the past had been often dispatched on scouting missions to find good collecting spots, and to teach divers what kinds of corals to look for, how to pack the corals, and how to ship them.

Now he works as a picker for many of the suppliers in Makassar, as well as the agent for a Jakarta based company which specializes only in "Super" corals. These two roles are totally complimentary; Rafiq gets a foot inside most of the Makassar companies, and then is able to purchase super corals directly from each supplier to send to his own boss in Jakarta.

Rafiq doesn't get paid much for this expertise; he later told me Faraz pays him 150k for a night of packing like this. However, it's clear that he's an important asset, not least because of his keen ability to spot sick corals. As he explained how to tell a sick from a healthy specimen, he emphasized that this was the kind of knowledge that was attainable only by years of hands-on experience. For example, some corals, when the outside edges are diseased or unhealthy, can be simply trimmed—like slicing away the moldy bits from a block of cheese. But other kinds are more difficult and depending on the grade of coral desired by the buyer, even a small area of disease or injury can disqualify it from being included in the shipment. Knowing the difference is crucial.

He reached into the tank and pulled out a "koral cabang," a "branching coral" (genus *Euphyllia)*, explaining that you can tell it is sick by the color of the skeleton and the tissue; if it is pale, it is getting sick and will soon get "dry" or "crusty," but if it is still grey or black, then it is still healthy. With some corals, like cabang, you can cut off a sick branch of the

colony, but the remaining number has to be at least 3, or it is not saleable, unless the colony is amazingly colorful or has large, very nice branches and polyps. He showed me another coral, a beautiful *Symphillia*, that had a small grey spot on the rim. This was a disease from the ocean, not from damage in transit; this could heal itself, but other diseases for *Symphillia* rarely if ever heal. It would go into the shipment.

Still, Rafiq thinks most of these diseases arise because of the sheer stress of the transfer process for corals. They are collected by chipping, put into plastic bags, unpacked to sell, packed again for shipment, unpacked again at the supplier, then packed again to send to the exporter, then unpacked, then packed again to be exported to the importer. And it *still* hasn't gotten to a home aquarium yet.

Some loss of corals is therefore expected on all sides—buyers know that it is simply a cost of doing business that a few of their purchases will not survive. The website of Rafiq's main employer, the Jakarta company, even went so far as to stipulate their policy on the matter. They guarantee a 95% survival rate—meaning that the order is not "claimable" if 5% or less of the corals shipped were "dead on arrival." If the DOA rate was above 5%, then a claim could be made within 48 hours of shipment arrival, and the company would arrange for replacements to be shipped. That number, 5%, is a low number for wildlife trade mortality; other species have significantly higher rates of death in shipment. However that 5% figure includes only the international shipment leg of the coral's journey—and does not account for corals that die at other legs of the shipment process, including those on the floor of Faraz's warehouse.

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Tonight, Rafiq is leading the picking, along with his brother-in-law and nephew. Hundreds of plastic bags have been prepared beforehand; the bottoms are taped into a square, so that when full of water, the bags will stand up on their own. A dozen white styrofoam boxes

stand ready to be filled. An assembly line is formed, though not Fordist by any stretch; it's too wet and messy and redundant for that.

A packing list is produced and followed, and Rafiq, his brother in law, and Ali each work to pack the orders, filling the floaty baskets with corals from the list from the various tanks in the building. The floaty baskets are then transferred to the tank by the bathroom, and float in a line, waiting to be packed. Whoever is packing picks up a coral from the basket and inspects it, looking for disease or other issues, and to make sure it is the right species—not always easy. Bad ones are put back in the tank, and a shout goes to the back of the room that they need another one of X species to replace it, though most pass muster. The packer grabs a sheet of plastic like a cafeteria worker wrapping up a sandwich. The coral is swathed in the sheet of plastic, then dropped into a clear plastic bag: the extra plastic layer is to keep the rough coral from rubbing on the wall of the plastic baggie, which could easily puncture the bag, killing the coral. The bag is dunked in the tank to fill it with water—but not too much!—and then set aside on a table for tying.

The packers then grab each bag from the and initiate an extremely specific and complex bag-tying maneuver. It took me *hours* to get even close to correct, but by the end of the night Ali told me I was "up to code,"[36] and gave me an encouraging thumbs up. However, Haris was the true bag master, the bag "guru." Closing the mouth of the bag with one hand, you twist the bag just so, so that the water and trapped air create a high-pressure globe of water. The bags are tight like a drum, and the surface tension helps stabilize the baggie. Because the little globes of water will be stacked in the coolers, anything too loose needs to be re-done so that the corals are not damaged in shipment. All of my first attempts needed to be re-done. When the bag is tight, you twist the top, and wrap a rubber band around the neck one, two, three times, run it around the base of the neck, and then snap it closed. This is hard. The muscle between my thumb and forefinger was at the point of failure by the end of the night.

The sealed bags are then stacked, largest on the bottom, inside the white styrofoam coolers. They are fit in snuggly to prevent excess movement, while the stony bodies of the goods slosh slowly, each in their own tiny oceans. When full, before being sealed, each cooler gets a tube of ice—a cylindrical baggie full of about a liter of frozen water—thrown in to help keep the shipment cool amidst the fluctuating temperatures of shipment.

Finally, a severe amount of cellophane packing tape is expended to seal the boxes before each is labelled—roll after roll is emptied on the floor, as the tape runs crisscross in all directions. I wonder to myself about how the "inspectors" will manage to peek inside the shipments—before I realize that they probably won't. It's nearly 10:00pm before all the boxes are loaded onto the truck with paperwork and sent to the airport for inspection prior to shipment.

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A few weeks later, on the morning that I was leaving for Kendari, Ali invited me to breakfast. His wife had recently managed to secure a small stall at the marketplace near his house where she sells yellow rice—nasi kuning—my favorite breakfast. It is a delicious sendoff—the welcoming friendship of Ali, Haris, Rafiq, and the other workers is the only thing I will miss.

Although the fare for an ojek or, motorbike taxi, in Makassar is very cheap, Ali and Haris have made a big deal about picking me up on their own motorbikes, rain or shine, as a forceful but genuine gesture of generosity. But today something is wrong—Ali apologetically tells me he can't drive, so I got my own ojek to the market. When I arrive, Ali shows me his right hand, his coral picking hand. It is enflamed, bulbous and discolored. "This is why I couldn't come get you!" he tells me. The skin is peeling off, and his fingers are dotted with blisters. He said that it happened just a few days after our late night of packing.

It wasn't the first time something like this had happened; once when they were unloading a shipment, a baggie had ripped open, and Haris accidently grabbed a fire

anemone which pumped his flesh full of nematocysts—stinging organelles used by many Cnidarian species for defense. His hand turned red and swollen, and the pain was excruciating. He said it felt like it was on fire, and was out of work for weeks.

The specific source of Ali's injury was less clear—it's possible that it was a fungal infection or a parasite, or an allergic reaction, or some kind of trauma similar to Haris's. He had handled thousands of marine creatures in the past weeks, any one of which could be responsible. Ali had sent a picture of his hand to Faraz—hoping that he would help him get it treated, since medical care was exorbitantly expensive relative to what they were paid, especially for a specialized injury like this. Faraz had connections at universities and hospitals, and he had lots of money. But he replied to Ali's picture with a curt text message: "Maybe you should see a doctor." I asked Ali if he ever offered to pay for it, to which he replied, "No, he only offered advice." Here the bodily vulnerability of Ali and other warehouse workers is on full display, something they had in common with the divers. There would be no special effort made by the boss—not even for the hand that picks coral.

Kendari: Quarantine and Inspection

I had thought that Makassar would be the base of my research because everyone said it was the center of the coral industry—especially the wild collecting coral industry. This turned out to be wrong; the real center for wild collection is Kendari. Like South Sulawesi, Southeast Sulawesi had its own regional trade group—AKISTRA—or the Asosiasi Karang dan Ikan Sulawesi Tenggara. But unlike Makassar, the companies in Kendari preferred a low profile. There were 11 coral companies in Kendari—more than any province outside Bali. Most of these companies specialized in collecting wild coral, but several also dabbled in mariculture. The volume of corals significantly exceeded that which is traded through Makassar, as did the number of companies and divers employed. In fact, I learned that plenty of coral exported through Makassar was actually from Kendari—the supply being greater on the eastern coast.

One of the first things I did after arriving in Kendari, before meeting any coral traders, was to visit the local fisheries ministry outpost—the BKIPM, or the Badan Karantina Ikan, Pengendalian Mutu dan Keamanan Hasil Perikanan—which is a provincial field office for the federal fisheries ministry. This office is tasked with inspecting all movement of marine products in and out of a given province, and to issue permits where applicable. The Kendari office was located on the outskirts of town, a large office directly off of the main road that leads to the airport; all air shipments were required to be brought directly to the office prior to shipment for inspection and "quarantine."

For the case of coral, the purported purpose of these inspections were several; first, to ensure that all the shipments were above board—that the shipments contained the same number of corals as indicated on the shipping permits, and that the species corresponded to what was listed. Second, BKIPM field agents were responsible for inspecting the "health" of the corals to ensure that no diseases were transmitted along with the corals. If the agents were satisfied that the shipment met these requirements, they would issue a certificate of health—a crucial piece of paper needed to complete coral's bureaucratic transformation into legal commodities. When the coral trade was shut down in May 2018, the mechanism to do so was to withhold this certificate.

The problem is that these two seemingly innocuous tasks—identification and health inspection—are incredibly fraught. Consider the mere requirement to check that the species being shipped accorded with the permits given. Coral taxonomy and systematics is a constantly shifting field, famously rearranging itself every few years as data become more complete and molecular techniques disrupt old family trees built on morphology. While some species are easy to identify because of highly distinctive features, the majority of stony corals are difficult to place beyond the genus level. The situation is not helped by the fact that corals are famously plastic in their morphology. Indeed, in many cases different genera are extraordinarily similar in appearance—so much so that even experts

often have difficulty without access to magnification tools to closely inspect morphology of small polyps. For instance, *Acropora*, one of the most distinctive, widespread, and familiar genera of corals (and by far the most abundant in trade) is easy to identify to the level of genus, but nearly impossible to reliably identify to the species level without extensive training—and Indonesia is home to over 100 species.

Then there is the question of "health," of corals—whatever that means. Coral health is nebulous and poorly understood. While there are certainly a few documented coral "diseases" with visible symptoms and identified pathogens, these are not very common. Absent sophisticated molecular investigations that would be absurdly costly and time consuming, there is little way for inspectors to guarantee anything other than that the corals they see are not already dead—and even that isn't always easy.

Now consider what happens when the inspection actually takes place. The white styrofoam coolers arrive to the office: they are tightly sealed with ungodly amounts of cellophane packing tape—how you might pack something if you were pranking someone and wanted to watch them struggle to open it. Should they manage to penetrate the box and remove the lid, they are met with a box filled with small plastic bags each full of water and a small pocket of air, drawn taught and spun to maintain a rigid structure. Most bags are small and could fit easily in the palm of your hand—the size of a baseball or maybe a softball for larger specimens. These are then stacked neatly in layers—packed just tightly enough that they stabilize each other without putting too much pressure. The inspector might then be able to pick up the bags from the top of the box and peek inside—but the water and the plastic make it difficult to see the specimen clearly.

Like government inspectors worldwide, the agents I spoke with told me that they typically take a random approach to inspections. The volume and velocity of the shipments are too much to allow a complete inspection in most cases. Instead, they choose a box or two at random, pry it open, and check to see that what is inside corresponds to the permits

filed for the shipment, and that the corals don't look "sick." In practice they usually only look at the first layer or two of corals in that random box; the idea of unloading and repacking the box—which is like reassembling a puzzle—is too much. Only if they find something strange will they proceed to unload the entire box and check the others in the shipment. Coral bosses are well aware of how this inspection process goes—and so they make sure that the top layers of their shipments are always up to code—leaving them some wiggle room lower down.

Once the shipment is through this inspection process, the office generates a "Certificate of Health and Quarantine" which is then affixed to the paperwork for the shipment, which, cleared for takeoff, is delivered to the airport. One could argue that these inspections are not the critical ones—given that Kendari has no international flights, and that corals shipped through that airport will be checked again at the airports in Bali or Jakarta, but even there the same problems still apply.

These problems are not unique to Indonesia in any way—instead they are indicative of the ways that the state creates inspection as a spectacle of power—to enact permission. I am thinking here of the famous 2015 investigation led by the US Department of Defense investigating the effectiveness of the Transportation Security Administration or TSA; when government agents tried to sneak fake guns and bombs onto commercial flights, TSA caught them only 5% of the time. This says something profound about the actual function of inspection—as spectacle (cf. Tsing 1993).

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These issues were driven home to me during one surprisingly frank conversation with the manager of a coral company in 2019 (not in Kendari). This boss told me about some of the strategies that companies use to skirt different forms of permission. He told me, for example, that in his opinion not a single coral wild-coral company in the country ever operated within their quota. First, he explained that there was an active market for quota—

so if company A doesn't have enough buyers interested, they sell their quota to company B for a few dollars, and vice versa. This is not allowed officially, but everyone does it.

More crucially, he alleged, not one company in Indonesia can say that they haven't exceeded their permitted quotas or shipped "extras," where a verbal agreement between exporter and buyer included one amount and the official export paperwork included another amount. This wasn't exactly a secret—in his opinion; in fact, his opinion was that the coral trade had been closed because this practice was so common that everyone did it. At first, I was skeptical of his generalizing claims—surely not all companies operated this way? But he walked me through the math in a way that changed my mind. "Let's unpack everything," he said: [37]

Imagine you are a company with an annual quota of 10,000 corals, each selling for around 30,000 IDR. 10,000 divided by 12 months is 833 corals per month. 833 x 30,000 IDR = 25 million IDR per month net. Now, that has to pay for *everything*—all the fees and permits for each shipment, and salaries for all employees, building maintenance, not to mention the taxes you may or may not be paying—ALL your expenses before you can even arrive at profit. "No way," he said. These companies are all sending shipments with permits for 1000 corals and actually sending 2 or 3 thousand. The main way that this is done is by sneaking in bags of corals with shipments of ornamental fish, burying them at the bottom of the Styrofoam coolers. Because fish are not governed by CITES regulations, there is minimal paperwork for these shipments, and the cursory inspection practices done by fisheries officials means that they are rarely caught.

This boss even showed me a WhatsApp message from a buyer in the United States to prove it. The buyer asked him—begged him, really—if he could hide corals in a shipment of fish. Just a few! Please! I'm desperate! This boss had turned him down; before the closure he probably would have said yes. But the closure of the coral trade had brought greatly heightened scrutiny of shipments of fish, and more regular and thorough inspections.

AKKII had informed its members to avoid this practice for the time being; if they tried and got caught, they would jeopardize not only their own company but the future of the entire coral industry in Indonesia.

This conversation helped put into context what I learned in Kendari during my visit to the fisheries office. When I asked fisheries officials whether they had received training to help them identify the different coral species, the agent replied that they had been taken on a field trip once to visit one of the coral companies—but no serious training. Some offices had copies of a small pocket-sized identification book that included several dozen of the most common corals in the trade with color photographs. But this book was still difficult for those without more fundamental training. As we discussed the issue, the fisheries representative suddenly grew excited and enthusiastically asked: Perhaps *you* would be able to train us?

I was taken aback, and politely declined—citing my real inability to do so, even if I wanted to. Before and throughout my fieldwork I was constantly studying and quizzing myself on coral identification—I brought with me the only readily available field guide for Indopacific corals and carried it with me at all times. After months of practice and diving regularly to see the corals in their habitat, I still was only able to identify a few dozen species from sight, and most of the time needed to consult my guide. In many cases the difference between two completely unrelated but similar appearing genera were things like a few millimeters of polyp size, or the presence or absence of tiny bumps in the calcium carbonate skeleton. They are difficult to identify even with a magnifying glass and some experience; doing so as a busy inspector by squinting through a twisted baggie of water is next to impossible.

So, if the staff weren't trained to do this work, and if the tasks they were asked to do were perhaps not even actually possible without huge amounts of time and expensive and well-equipped laboratories, then what was the point of the quarantine process? The

answer, perhaps not surprisingly, has to do with divisions of power across the different arms of the state. The quarantine process have been more about extending the power of the fisheries ministry than it was about accomplishing its stated goal. To understand why, let's take a closer look at executive power in Indonesia.

Who May Grant Permission?

The political economy of coral in Indonesia—and the event of the 2018 coral trade closure—makes more sense in the context of the distribution of executive and managerial power across ministries in the Indonesian government. In simple terms, in 2017 and 2018 the Fisheries Ministry was struggling to articulate itself as the central locus of power and permission that would animate the live coral trade—and the governance of all marine commodities. To accomplish this—to demonstrate, articulate, reproduce, and grow its power—the fisheries ministry exercised its ability to withhold permission by withholding a key piece of paper necessary to move coral from one place to another, gumming up the whole system.

This kind of politics is far from new. For decades cabinet posts have been a key site of internal struggle within the ranks of the Indonesian government, especially during the decades long New Order regime where the cabinet was frequently restructured, dissolved, and reshuffled at the whims of former president Suharto.[38] Both Forestry and Fisheries were originally conceived of as "directorate generals" within the Department of Agriculture—a legacy of the time before the idea of "the environmental" as a domain of modern life became widespread. Only in 1983, due in large part to growing interest in commercializing Indonesia's vast forests, was Forestry elevated to its own "Department," taking with it managerial roles related to environmental governance—including the role of Management Authority for CITES.[39] In a country like Indonesia with vast natural resources and among the most biodiverse and valuable forests in the world, the Forestry Ministry has long been one of the surprisingly powerful branches of government, in charge of managing

vast tracts of publicly held land. It was only in 1999 that the Indonesian government elevated Fisheries to its own Department—somewhat ironic in the world's first and largest archipelagic country—one which controls vast tracts of marine space.

Since then, the Ministry of Fisheries has sought to expand its own power and authority within the Indonesian state. This effort reached new heights in 2014 with the election of Joko Widodo as president, and his appointment of Susi Pudjiastuti to the position of minister of fisheries. Pudjiastuti or simply "Susi" as she is more commonly known, made waves almost immediately. Under her leadership the ministry took aggressive stances on excluding foreign fishing vessels from operating in Indonesian waters, including famously capturing hundreds of ships in coordination with the navy, and blowing them up with military explosives in spectacular displays. By some estimates, Susi's aggressive policies may have reduced foreign flag illegal fishing efforts by as much as 90% (Cabral et al. 2018). These displays of force earned her admiration across much of the international marine conservation world.

However, within the ranks of the Indonesian government—particularly among unelected bureaucrats and career officials, Susi was often very unpopular, with a reputation for sudden unilateral decision making that flouted the well-worn hierarchies and channels of bureaucratic power. Indeed, the political scientist Fabio Scarpello, based on extensive interviews with fisheries insiders, reports that an informal coalition of detractors began organizing to oust Susi from her post almost as soon as she assumed it. Their efforts, he argues, ultimately resulted in her replacement after Jokowi's second election (Scarpello 2020)—but they also created an intervening atmosphere of paranoia. With the not-totally-inaccurate perception that there was an organized coalition working against her, Susi and her team closed ranks, forming a tight inner circle at the top of the Fisheries Ministry.

Scarpello's findings strongly resonate with what I heard from fisheries officials and academics in Indonesia—among whom Susi was a frequent subject of discussion and

debate. Two high ranking fisheries experts told me that they had been placed on Susi's "black list" after she perceived them to have disagreed with some of her decisions. They said that she has the tendency to work on her own, without consulting or working with others, and preferring to act unilaterally. One of them was invited to be on a committee advising Susi on policy matters, but told me that although he was never actually consulted, his name was used to justify policy decisions he disagreed with. Susi, it was alleged, would gather the names of advisors as armor, but never actually spoke to them.

In hushed tones, as if discussing the inner workings of the politburo, these same experts told me that at one point Susi's inner circle started circulating posts on social media with a list of names which said something to the effect of "These scientists are part of the fisheries mafia." The accusation was that many fisheries experts were simply corporate shills—paid off by the fisheries corporations to anoint their extractive endeavors "sustainable."

It's worth lingering for a moment on this deployment of the term "mafia." This usage is common in Indonesia where the term is used to describe systems which operate on principles of rent seeking, clientelism, and in-group solidarity among the business and political elite—sometimes with implicit or explicit threats of force. For example, the justice system is often referred to simply as the "mafia peradilan," or the "justice mafia."[40] The timber industry likewise has often referred as a kind of "mafia," (McCarthy 2006), as are the fisheries industry and mining sector. There are "land mafias," which work to dispossess ordinary people, and gas mafias which pass off natural gas contracts to political insiders. In this way, "mafia" has become an emic category in Indonesia—a ready-to-hand epithet to decry corruption or dirty dealing, especially forms that marry the state and capital. It even became the book title for a prominent Southeast Sulawesi academic and politician, Dr. La Ode Ida, who published his polemical anti-corruption book *Negara Mafia*, or *Mafia Nation* in 2010.

The “mafia” accusations against fisheries scientists, while perhaps bombastic, may not have been completely baseless. I learned of a number of researchers, some with significant government influence, who simultaneously served as researchers, regulators, and commercial advocates for the industries they were tasked with overseeing—including the coral trade. However, the manner in which Susi’s accusations were made—publicly, polemically, and on social media, with insinuations of a rogue dark seafood cabal pulling the strings of power—enraged wide swaths of the fisheries world.

Even the very experts at the Indonesian Academy of Sciences who were tasked with monitoring coral reef health and recommending trade quotas for CITES management were completely sidelined in the decision to close the coral trade. I was told that one senior researcher was furious when Susi decided to stop the coral trade—because it meant that she was calling the veracity of his data into question. "If you don't believe my data, then where is your data?" he allegedly said.

Domestically, Susi was also a controversial figure—popular in some arenas, and unpopular in others. While one might expect that local fisher folk would be glad at vastly reduced competition from foreign vessels, the news was dampened by what local fishermen felt were onerous regulatory hurdles. In November 2014, Susi’s ministry froze the issuance of new fishing permits for six months; the target was large fishing corporations, by which she earned many enemies.[41] But the collateral was wide, and the moratorium impacted fishing communities around Indonesia. Susi was already unpopular in Kendari for these reasons—but after the moratorium on coral exports, for divers the 2018 presidential election became a referendum not on the president, but on Susi. She was equally unpopular with rank-and-file fisheries ministry employees who saw her style as too confrontational and bombastic. In fact, with some exceptions, the vast majority of people in Indonesia who spoke with admiration of Susi to me were foreigners—mostly those with interest in marine conservation.

It is hard not to see gender and oligarchy at the center of these debates—Susi Pudjiastuti was a true political outsider who bucked expectations of pedigree, gender, education, and class backgrounds to race to the top of an important ministry. She was not from an elite family. She is the only person to have served in the cabinet without finishing high school—she was expelled as a teenager for agitating against the Suharto Dictatorship—and she got her GED while she was Minister of Fisheries. She is a chain smoker with a distinct, raspy voice. She has prominent tattoos. She is divorced. Her major policy initiative as Minister of Fisheries was to bomb foreign fishing vessels operating illegally in Indonesia. The strangeness of her story only serves to highlight the unbridgeable chasm that seems to separate ordinary Indonesians from elites who run the country. Indeed, Susi and her troubling of the norms of gender and power thrilled many Indonesians and terrified many more.

Indeed, on several occasions I heard fisheries insiders critique her for what they saw as her emotionality and her proclivity to anger. But it's hard not to wonder if her anger seemed more extreme to some because it was the anger of a woman and because it was anger expressed in public—the kind of woman who showed her disapproval of fish poachers by blowing up their boats on live television. Indeed, Susi's statecraft was explosive. She eschewed the old boys network of political back scratching, and in some ways, went rogue. It is also indisputable that the power of the fisheries department was vastly expanded under her tenure.

Conclusion

Throughout my research I heard coral bosses allude to some kind of informal decision or deal that had been reached some years earlier that would see the Indonesian coral trade shift completely to mariculture by the year 2021, leading to the total phasing out of wild coral collection. It seemed that the plan was to gradually taper things off—to slowly reduce the quota numbers each year, while making their issuance contingent on companies

showing evidence that they had begun to create the infrastructure to make a transition to coral farming. Indeed, many coral companies, including Imran's, had loudly signaled their intent to begin to transition—and had started to place "tables" of transplanted coral in spots that they might want to establish farms, staking their claim to oceanic territory. But I always wondered if the purpose of this was simply to play the game—if it was all for show, or if there was real interest in moving to coral farming. Indeed, the bosses never seemed all that concerned, even though the impending deadline was only a few years away. Were they calling the bluff of the government—convinced that they wouldn't go through with the plan in the end? Or were they planning to continue collecting wild coral and laundering it as maricultured? Or were they simply that confident in their ability to navigate and negotiate a favorable outcome—to play the economies of permission that kept them in business?

In 2017, when discussing this problem with a prominent coral boss, he told me about a concerning decision from the very top, from the desk of the president himself, which declared, as he put it, that "pemanfaatan koral sudah distop," or that "coral utilization has already been stopped" (speakers of Indonesian will recognize the strangeness of this wording—including the passive voice use of the English word "stop," for emphasis). He told me that the government would no longer be issuing new permits for wild coral collection—though those who already had permission would be allowed to continue, at least for the moment. In the future, only mariculture would be allowed.

Confused and unable to find reference to what he meant, I followed up with Pak Wahyu back at AKKII, who explained that this was probably referring to a 2016 presidential decree (PerPres 44 2016) which regulated which sectors were open to investment. The rule sorts industries into those which are "Open," "Closed," or "Open with restrictions," and governs who can invest or own certain kinds of businesses, including questions of foreign ownership in sensitive industries like weapons and chemical production. However, because

of its emphasis on restricting investment in certain industries deemed to be harmful to the nation, this decree was usually called the "Negative Investment List." The list included things like Marijuana cultivation, Casinos, Chemical weapons, DDT production, and Radioactive mineral mining. But coming in at number four on the list of "Closed" industries, right after "looting treasure from sunken ships," was the trade in coral, dead or alive, for any purpose.[42] Apparently gathering beautiful corals was as dangerous as producing mustard gas and or mining uranium.

This list is updated and reissued every few years; previous iterations in 2014, 2010, 2007, and even the original "Negative Investment List" issued in 2000 had each included coral on the list. The original 2000 regulation, issued under the presidency of Gus Dur during the early days of the post-Suharto reformation movement, listed the coral trade as "Collecting / utilizing coral reefs (sponge)," where "sponge" appeared in English as a translation for "Terumbu karang" or coral reef, highlighting the gap between knowledge of corals and their regulation.

It was therefore unclear why the 2016 reissuance had caused a stir in the coral world; the disappointment seems to have been tied to hopes that Jokowi would remove coral trading from the list, opening new opportunities for investment—especially foreign investment. Still, inclusion on the list hadn't stopped the coral industry from flourishing over the previous two decades—though perhaps it prevented the kind of foreign capitalization that would have potentially supercharged coral collection and export. However, one thing was different with the 2016 list: while in older lists the coral trade was listed as being part of the "Forestry" sector, in this list it was now suddenly included under "Fisheries," representing a successful extension of power of the Fisheries Ministry.

In 2021, the Jokowi administration replaced the 2016 decree with a new investment list (PerPres 10 2021), signaling a radical change in how the Indonesian government has approached the question of foreign investment. Jokowi had publicly set

ambitious goals for Indonesian economic growth and industrialization, and he viewed "cutting red tape" and attracting foreign investment to previously closed sectors as central to that work. As I scanned the 90 pages of attachments outlining ownership and investment rules for different sectors, however, coral was nowhere to be found. Had the restriction been lifted? I soon realized my mistake: the "Negative Investment List," had been moved out of the domain of presidential decree, and into the domain of the Indonesian legislature—specifically to the notorious 2020 so-called "Omnibus Bill" (UU No. 11 2020).

The 2020 "Job Creation" bill, or the "Omnibus Bill" as it came to be known, was the cornerstone of the government's push to increase foreign investment and grow the economy—ostensibly to "create jobs" and push Indonesia closer to the goal of middle income status. But that growth was to be achieved at the cost of eliminating key legal protections for workers, people with disabilities, customary and indigenous communities, and the environment. Massive protests against the bill rocked Indonesia in October 2020, uniting broad swaths of society in unlikely alliances; yet despite the outrage, the bill passed in November that year. Gone was a guaranteed 5 day/40 hour work week, and it would now be much easier to fire workers. The bill also included deep subsidies for investment and construction of new coal powerplants, and completely dismantled the environmental permitting system that legal scholars and environmental activists had worked for years to establish. Environmental protections were hollowed out to such an extent that even major capitalists and investors, as well as the IMF, and Moody's Investor Service began to raise alarms that the bill could lead to sharp increases in deforestation and other kinds environmental destruction that would in the end only hurt economic stability and growth.

The Omnibus law is a fundamental transformation in the economies of permission that govern commerce in Indonesia—literally re-writing hundreds of provisions from dozens of different laws in a complete re-shuffling of the distribution of authority to grant

or withhold permission. It resulted the effective dissolvement of many stages of permit issuing and permission seeking that had once been required to do business in the country. Legal scholars, activists, and even politicians themselves are still trying to make sense of the profound ways that the bill will be transforming life in the country for years to come. Indeed, the bill was so long and complicated (over 1000 pages), its creation so opaque and undemocratic, and its passage so rushed that apparently many lawmakers claimed to be surprised at the real-world effects of some of the provisions they themselves had supported—including one that gave amnesty to illegally operating oil palm plantations, allowing them to become laundered into licit operations (Jong 2021).

But while the 2020 Omnibus bill changed almost everything about commerce and political economies of permission in Indonesia, some things remained exactly the same. After searching for what felt like hours, I managed to find where the "Negative Investment List" had been tucked away—Section 5, Article 77. There, buried on page 528 and sandwiched between smuggling critically endangered species and manufacturing chemical weapons, was the live coral trade. This at least would stay the same.

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This chapter has followed coral's bureaucratic life, tracing the economies of permission that must be negotiated as coral moves between its instantiations as ordinary creature, inventory, commodity, and political pawn. Coral cannot become a commodity without the deft negotiation of these economies of permission, and the ability to do so is what separates a worker from a boss. A boss's special ability is to massage and navigate this maze of regulation and permission, and to whisper the magic words to the different state agencies to make the right pieces of paper, the right permits, appear.

Though perhaps not as consequential as other large industries like fisheries, mining, manufacturing, or logging, following coral nevertheless helps illuminate the idiosyncrasies of Indonesia's political economy, often in surprising ways. We see the

machine of permission operate as a system of self-replicating conflicts of interest, and coral helps to demonstrate the chasms that separate the *de jure* state of things and *de facto* realities on the ground.

And what about the ban on coral? Was it put in place because of good-faith sustainability concerns? Or was it a technique on the part of the fisheries ministry to assert its power and management authority over all the creatures of the sea? My research suggests both. The ban remained in effect for all of 2018, all of 2019, and into early 2020, when it was finally lifted.

And the previously agreed to phase-out of wild coral collection scheduled for 2021? This has yet to happen; it appears that the bosses were justified in their lack of concern. Whatever happened behind the closed doors of the ministries and trade group meetings between the years of the closure, the outcome has been to maintain the status quo, at least for now; after all, many of the most desirable and expensive corals cannot be successfully grown in captivity. However they managed it, by luck or by skill, the political economy remains turned in the bosses' favor. The question now is how long they can keep the party going—how much longer they can continue to reproduce the permission that allows them to extract fortune from the hands that pick coral.

INTERLUDE
The Shrimp Factory

My friend Danial, a local anthropologist, invited me along for a hike in the woods on his father's land north of the city to look for trees for his research. We will have two guides today. First, Alan, a forestry student at the university who knows the names of all the trees and how to work the GPS unit. Jefri was Tolaki, but raised on Buru, in Maluku, an island made famous by its erstwhile prison camp and Pramoedya Ananta Toer's epic *Buru Quartet* novels which were composed there. Jefri grew up in a great sea of diasporic coastal settlers from Sulawesi, though his was the only Tolaki family—everyone else was from Buton or Wakatobi—the more stereotypically mobile ethnic groups.

Our second guide is an elder Sufi mystic who knows this land well. On the drive up, Danial explained to me that you never know who is a practitioner, because part of the practice is modesty and being hidden— to live a simple life full of prayer and meditation. We never know; when we meet a farmer or fisherman, who seems like an ordinary person, it could be that he is a great Sufi figure.

We arrive to the old man's stall before seven in the morning, and it is already hot in the sun. He has forgotten we are coming, but is welcoming. He is wearing a batik shirt and a sarong. He takes off the sarong to reveal some torn and dirty cargo shorts, and noting the clean, long pants worn by Jefri and Danial, he asks meekly if this is ok. I smile and point to my tattered shorts, and we all laugh.

Danial has begun to explore a research project focused on *serong*, often called "fish fences" in English, an indigenous technology of fish harvesting used across Eastern Indonesia. It is just as it sounds: you build a long fence in the ocean in shallow water, usually on a reef crest or ridge; when fish hit the fence, they follow its edge, which leads into a capture area where they can swim in, but not out—a giant fish trap. Danial is interested in

observing the entire process, from conceiving the idea, to collecting the wood, to attaching the netting, to harvesting the fish. Our goal today is to see the kinds of places and kinds of trees that one might use to make a serong. Imran once explained that serong creation requires a special kind of *ilmu*, or magical knowledge, to work properly; you can build one without *ilmu*, but the fish won't come. The old man agrees.

We walk along the main coast road for a few moments before we find a dirt track and walk into the gently sloping garden forests on the landward side. We are in the driest of the dry seasons now, so the ground is parched and dusty, and the vegetation hot and crisp, with pungent smells of dryness. We pass a flowering cashew tree—the blossoms smell of heaven.

As we walk along the old man points out various trees, and Danial and Jefri stop to take measurements. This landscape is thin; thinned. The plots are filled with countless thin trees, many the diameter of a fist or less. When trees mature enough to be used, they are used, with few exceptions. One of the only larger trees they point out are Acacias; they are already big and thick within only a few years, probably 8 or 10 inches in diameter. Jefri says you have to be careful, if not managed, these can take over a landscape. However more interesting are the *kayu besi*, or ironwood—a group of the highest quality trees with heavy, dense hardwood, and native to Indonesia. Nobody plants *kayu besi*, they all tell me, it just grows itself. On their land, they are cutting the kayu besi trunks when they are smaller than fists. They are piled up by the side of the path. They grow back from the coppices of old stumps, which are often cut high, at chest height or more (perhaps to spare them having to compete with other plants on the ground. Trees are indeed shapeshifters (Mathews 2022). Kayu besi is the preferred wood for making serongs (and boats) because it is extremely hard and resistant to rot. Later, I message Jefri asking for information about kayu besih. He tells me that there are many, many species which together are called kayu besi; each island has its own species and name. The one we saw locals call more specifically "kayu nona" (or

sometimes kayu ulin) and he tells me that it is *Xanthostemon petiolatus*. These are among the densest woods on earth.

After our investigations of the serong wood are complete, the old man wants to show us something. We keep walking, and find a stone staircase partly hidden by leaves and gravel. It descends down into a beautiful deep clearing alongside a small river, shaded by towering trees. There is a stone formation with water spilling out from it, and next to it a cave. In the rainy season I imagine this place to be lush, paradisaical, verdant. This is a holy place, *keramat*, the old man tells us. There are some large weeping figs trees, (I: pohon beringin)—sacred trees, homes of spirits. And there is one very large, very old kayu besi tree; were it anywhere else it would have been long gone, but it is here, it is keramat, by which he means that it belongs to someone who can't be seen, and is therefore protected. The old man and other Sufi mystics come here to practice *dzikir*, to repeat the name of God 33 times, to enter a meditative state and separate their souls from their earthly bodies so that they can travel and communicate across time and space. This is partly how Sufi social networks are formed: mystics often come to know each other in the spirit world long before they ever meet in the flesh. In this moment, however, we listen as the old man tells us that when he prays here lately, it is not always peaceful. He sometimes hears voices in this place which belong to the spirits, djinn perhaps, who live here. Heard, but not seen. A place of barang halus, makhluk halus; invisible things, invisible beings with uncertain intentions.

The mystic finished speaking, and we were resting, silently, contemplating what he told us, when suddenly we heard voices from the river. I am primed to believe, and caught by shock, as is apparently the old man. But it turns out not to be the voice of the river or the trees, but the thick Javanese accent of a businessman worrying about his gleaming white sneakers getting dirty from the muddy riverbed.

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I go down to speak to the men, stepping across stones in the river brown from lack of flow, past a PVC pipe that carries water down to the village near the coast. The men are here for fun and for work. They are from the shrimp factory on the coast. One man is more gruff; you can tell he is a local by his appropriate foot ware: rubber boots. The other man is sweaty, and wearing nice, if muddy, sneakers.

He is from Java, he was offered a management job here by someone in his family to help run the business. Their other factory is in Papua, so he is just glad he is here and not there, because here is still "pretty ok." They are here to investigate the water source, because there are plans to add a second water pipe to supply the factory. The water flowing into the first pipe is barely a trickle; I can't imagine a second pipe trying to eek out water. But these are freshwater shrimp they are producing, so they need freshwater, sacred or not, to fill the ponds, to rinse the shrimp, and to make ice to kick start the cold-chain that would link the little factory on the coast to the supermarkets of the global north.

A few days later, Danial and I visited the shrimp factory—and I begin to understand the dueling commercial logics that are remaking the Sulawesi coastlines. Like many Indonesian corporations, the company has an impressive sounding Sanskrit inspired name; let's call it: PT. Citratama Jaya Graha. In 2018 they had been in this location for about five years, a branch of a larger company with operations around the country, in Sumatra, Java, and in Papua, all focused on shrimp. They came to this location when the former occupant—a tuna factory—sold because there are so few tuna left that it became hard to make money.

When they first arrived, they faced the challenge of deciding what kind of seafood they would specialize in—what was still abundant enough. They were considering two paths—focusing on higher value wild-caught seafood, such as octopus—or repeating their success exporting farmed shrimp. It didn't take them long to settle on shrimp. The

Javanese manager explained to me that tuna and octopus and other wild products rely too heavily on the beneficence of nature:

> "For wild products, you know, they have seasons. But with shrimp ponds, that can be controlled [diatur]. For wild seafood, if they disappear, what will you do? What can you process? With all this staff to pay, it's a big risk.
>
> And all the seasons! So many seasons. People around here are always talking about "west winds, this wind, that wind"—that stuff I don't get it, I don't understand. 'Oh now we've got this wind for a bit, then wave season, then dry season, then the sailing season, then rainy season again,' I just don't get it.
>
> Last year we tried octopus, for example. But it totally depends on the season and weather, just like fish. After one trial, we just stopped. Too much risk.
>
> That's why we like shrimp. It's always shrimp season."

Octopus is more valuable by weight, but in the end, they decided to go with shrimp because the webs of relation required to procure octopus are too complex: the seasonality, the forms of skilled labor, the way that it can only be done with small-producers out on their small boats in shallow water, one guy collecting one octopus at a time, and only on the calmest days of the year with no wind to create ripples on the surface of the water that obscure the view of the reef below—too many dependencies and entanglements to guarantee a smooth and reliable supply. Plus, octopus vary greatly in size, making standardization a challenge. And then you have to go around and aggregate all that supply—gathering it all up from the small producers in their small boats in their small villages, and hope it all adds up to enough to count as "inventory."

Shrimp is less valuable by weight, but easier, and much more amenable to standardization and industrial forms of production, sorting, and packaging via intensive capitalization. Shrimp ponds are stable, not moveable; they generate perfect commodities through a cyclical, machinic series of inputs and basic fungible labor. Octopus are something else, they require a kind of knowledge and understanding of regionality and seasonality and place. The work that turns them into commodities is not as easy to

understand as labor in the classic sense—as interchangeable, as about time and physical exertion. It is more about a particular embodied knowledge of the reef. Indeed, my friend Jaspar—a local dive master and guide—tells me that nobody knows the reef like octopus fishermen, because they spend their days skimming the reef bent over the edge of their canoes, masked faces in the water, patiently tracking the topography and looking for a sign of motion.

Lucky for the Javanese manager, this coastline has a rapidly growing shrimp pond industry as its coastal wetlands are destroyed and turned into giant muddy pools, and huge supplies of shrimp are already available from Kolaka on the other side of the province, from where they get about 60-70% of their shrimp. Most are from what he calls “traditional” producers, as if shrimp aquaculture was an ancient art. He contrasts them to “intensive” shrimp production (I: *intensif*). From what I can tell these two are actually basically the same, with the difference being scale.

He shows me a video of what he means by "intensive" production. Huge pools larger than football fields are filled with brown, brackish water. Inside are millions of shrimp. A few large spinning wheels turn rapidly to aerate the water. The pools are dug by a giant excavator and lined with tarpaulin. The inputs are industrial: the food is pellets made from industrially caught fish, or sometimes just the waste products of shrimp factories themselves—powder made from the decapitated heads of previously processed shrimp. Massive quantities of antibiotics as well. Miscellaneous nutrient inputs; "vitamins" he calls them. After the shrimp are harvested, the pools are drained, and allowed to dry to sterilize them from the buildup of disease and shrimp feces. The timelines are “intensive” as well. Intensive shrimp will have a harvestable size in less than 2 months, whereas "traditional" production would be expected to take longer, at least 2 months—still pretty intense.

However, he doesn’t like the risk involved in depending on outside supply, so the plan is to begin producing their own shrimp in the waters alongside the factory. They are

in the process of getting "izin reklamasi" or “permission to reclaim” so they can begin building their own industrial scale shrimp ponds. To build, they need many, many permits: from the fisheries ministry, from the provincial government, and maybe also from the forestry ministry; he’s still not sure. The place they hope to build the shrimp ponds is currently a small mangrove forest, surrounded by the serong of local fishing families. Unfortunately, those will have to go. It is the price you pay for progress.

Despite the Javanese Manager’s incredible efforts to micro-control every step of the production process, despite his quest to eliminate all uncertainty and risk, these forms of contingency found him nonetheless. Indeed, even relatively industrial shrimp production in Kolaka is not controlled enough, because the shrimp’s growth there depends on the weather, and the weather is becoming unpredictable with climate change. The most recent harvest failed completely because the weather was too hot; all the inputs and capital and time vanished—poof. If they could control it here, doing things “intensively,” perhaps things would be different.

At the moment 100% of their product goes to Japan. However, they hope to start selling to the United States; some of their branches are already selling most of their shrimp to the US. Americans really, really like shrimp, he tells me. He says they are waiting for an elusive "green card" as he called it, by which was meant some kind of import permit. "America itu golden ticketnya," he says: America is the golden ticket (the irony of this reference to Willy Wonka’s mad factory is lost on me in the moment). Green cards, Golden tickets, Reclamation permits—the factory is enmeshed in far flung webs and economies of permission that allow it to operate.

The Javanese manager used the word “risiko” (I: risk) twice in our conversation, first to describe how natural processes and seasonality are a source of uncertainty, and therefore, of risk, and second, to describe the risk created by having such a large staff and significant ongoing operating expenses. It is a tautology of risk: the reason they have large

operating expenses is because of their intensive mode of vertically integrated production—which was designed to eschew the "risk" of natural cycles; if they didn't have such large internal operating expenses, then they wouldn't worry about pauses in supply. But if they didn't have to worry about supply, then they wouldn't have to worry about overhead. This implies that there is something else at work—a desire for predictability, regularity, certainty in production, control, flow, revenue—sheer stability and comfort. They seek a regular supply, a steady flow, a reliable source of income, even if its profit margins are eroded by increasing operating costs. They would rather internalize production, they would rather control everything than to externalize and allow too much chance into the equation. Wild commodities require fortune—chance, luck, windfall. Shrimp instead requires control, integration.

Danial and I leave. While riding back to the city, we stop for a moment along the side of the road near the place where they want to build the shrimp ponds if they get their permits. We are near the bridge which crosses the little river where we met the shrimp guy yesterday in the forest. The water is barely trickling out. It is a beautiful little patch of mangrove forest, and not just mangroves, but countless other species as well, palms, and other beautiful plants, shore birds, crabs, mudskippers. The mud is full of clams and cone snails and other delicious things to eat. At high tide the water is full of baby fish which spawn here, growing in safety before swimming out to sea. With luck they will grow, perhaps to be caught one day by a local fisher and eaten for dinner. Soon this will all be gone.

CHAPTER TWO
A Shark on Board

We were hovering over the reef, shallow and illuminated light blue from the sun bouncing off the sandy slope beneath us. I floated in the water, kicking gently with my fins attached, snorkel dangling from my face. I had just come up from a short free dive a few meters down, warming myself up and getting used to the water. There was no room on the small diving boat for my bulky SCUBA equipment, and so I had learned to free dive while holding my breath while my friends plugged themselves into a diving compressor. As they donned their gear, Donny, one of the non-diving crew members of the *Two Sons,* casually leaned over the side of the boat, appraising me.

"See you have limits, Joe. You have to hold your breath! But not us, we have the compressor," he said in a serious tone, slapping the hollow, rusted tank of the strange machine that rested quietly beside him, waiting to be churned back to life. Donny stood, shouting augustly to the empty sea around us as he gestured dramatically to the compressor: "This is our wind! It has no limits! Except gasoline!"

The machine in question was a heavy orange "Shark" air compressor—the kind used at roadside mechanic shops to inflate truck and motorbike tires across Indonesia. Sometime in the 1980s, fishermen realized that they could use these compressors to go diving by attaching long lengths of garden hose and sending divers down in search of valuable marine products; today there are many thousands in use across Eastern Indonesia, blasting high pressure air underwater to inflate the globe crossing commodity chains that link Indonesia's coral reefs with luxury markets abroad.

The Shark on board transforms what is possible for the human body at sea. As Donny proclaimed, the compressor obliterates the normal limits that have structured the human interface with the ocean since people first began diving by holding their breath.

Even whales and dolphins usually only go minutes without breathing; on the compressor, divers can stay down for many long hours. And yet while this seems like a story of the expansion of human agency, the reality of utter dependence on as mercurial a contraption as the shark creates new forms of risk and vulnerability.

Despite its name, the Shark on board the *Two Sons* was not designed for rough marine conditions, and the machine protested its forced amphibious career whenever possible with an endless series of mechanical failures. Only a few years old, the compressor was being eaten by rust, spurred on by daily trips to sea and the battering of squalls and salty winds. Its hose fittings, cracked under the equatorial sun and rattled loose by the engine's violent shaking, were sealed with old plastic bags, and the choke was held shut by rubber bands. The engine mounts were so worn that the motor had to be lashed to the tank by old pieces of nylon line. Each time they wanted to start the engine, they had to manually wind the pull rope around an exposed gear, since the housing had long since fallen off.

While a new "Shark" with the same specifications could support two or even three divers at moderate depth, the *Two Sons'* compressor was limping along, barely able to supply enough air for a single diver, and so my friend and the ships' captain Imran would descend alone, scouring the reefs for high-value live corals in search of a windfall and a lucky break.

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What happens when you become dependent on a machine—which then falls into disrepair? This chapter explores the intertwined breakdown of body and machine in the Anthropocene, thinking through what anthropologist Julie Chu (2014) calls "the workings of disrepair," where the agentive breakdowns and disrepair of the infrastructure of ordinary life generate zones of political contestation. In a similar vein, I think of Laura Bear's (2014) analysis of the lived experience of austerity as neglect and abandonment, where maintenance of waterways is allowed to lapse, and ordinary people are left to navigate increasingly dangerous landscapes.

Figure 9: The Shark on board the *Two Sons*

I explore how labor is remade under conditions of chasing less with more, examining how the diving compressor has remade the human interface with the ocean, changed the work of diving, and facilitated the supply chains that connect the reefs of Kendari to aquariums around the world. Divers rely on the compressor to chase increasingly rare corals; the compressor as a form of intensification makes the supply chain possible even when reefs continue to vanish. But the compressor has other effects as well, accelerating risk for the divers, financial and bodily risk alike.

This chapter started as my attempt to make sense of the ways that work and the everyday economic lives of ordinary people are being blown up and transformed in the Anthropocene. It is a deadly feedback loop—as ecosystems break down and are hollowed out by industrial destruction, the conditions of labor are forced to change too, often in radical ways. Here I focus on one kind of work and one change—namely, what the

compressor has meant for the labor of divers working in the marine product economies of Eastern Indonesia—how the compressor has changed the valorization and conditions of their work, and how it has helped facilitate the wholesale exploitation of both divers and reefs.

I argue that the compressor transforms the time-space of the human body at sea. The compressor pushes at the limits of the body, and pushes divers to exceed their own corporeal limits. As the natural limits of the body fall away, they are replaced by mechanically augmented capacities. The living labor of flesh and blood divers is ruptured, and in a kind of necromancy, the compressor as dead labor ventilates the body of the diver and the supply chain itself.

Diving labor is an assemblage that at its most basic creates a cyborgic chimera of diver-compressor-boat. Over time I came to see that the breakdown of each of these components is intimately interconnected, as we will see below. I show how divers are faced with a supersaturation of risk—financial risk that is transmogrified into the bodily risk of dangerous, sometimes deadly work. Their bosses, in hoisting the burden of capitalization on the workers, eschew their own relatively modest monetary risk, which become perils, bodily risks, for their divers.

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Diving has long been associated with expansion of human agency: bodies of all varieties are easily outfitted for the life aquatic. In 1942, Emile Gagnan and Jacques-Yves Cousteau developed the world's first Self Contained Underwater Breathing Apparatus (SCUBA). In English, they called it the "aqualung," a new machinic organ which promised to make humans into bona fide sea cyborgs. Mid-20th century pop culture obsessions with military frogmen drove home the extent to which diving equipment and other emerging technologies seemed to generate new kinds of human hybrids. With the aqualung, the limits of the human body were exceeded, reaching unseen depths. But not all diving feels

like freedom. Many, or perhaps most, commercial divers in the global south, including marine product collectors in Indonesia, rely on equipment that puts them in danger every time they descend.

Before the invention of diving equipment, marine product collectors relied on masterful feats of breath-hold diving in their search for pearls, sea cucumbers, and other riches. One 19th century account describes an elite diver in Sulu who could stay underwater "so long as is required to make a dish of chocolate" (quoted in Warren 1981: 73). Yet even the most skilled divers measured themselves in mere minutes. Since time immemorial these few minutes structured the human experience of the ocean in which humans were mere visitors. Limited by time, divers learned how to read the reef; intimate knowledge of underwater topography being crucial to avoid wasting time and breath.

This changed with the birth of the diving helmet and heavy canvas suits used by commercial and military divers in the 19th and 20th centuries for maintenance, or to harvest pearls. These suits also relied on boat mounted compressors but were so expensive and labor intensive to use that they were almost never seen except on extremely large, well-financed corporate or military vessels—and the range of motion of the divers was severely limited by the heavy, bulky gear. Then came SCUBA and the aqualung, but these too required expensive equipment and technical knowledge beyond the reach of ordinary fisherfolk. Indeed, although scuba gear had been in limited commercial use in Indonesia since the 1960s, in the 1980s these rigs largely were ditched in favor of a newer, cheaper alternative: the compressor (Fougeres 2005). The idea was simple: rather than carrying a limited supply of air in a tank, why not use a boat-mounted compressor to pump air directly to divers underwater? Not only was the compressor much cheaper than scuba gear, but it could be shared by many divers at once, and seemed to allow for longer, deeper dives—almost as if the air supply had no limits.

Indeed, the compressor remakes the timespace of the human body at sea in materially significant ways, removing the urgency of holding your breath, and freeing you from the constraint of monitoring a limited air supply in a tank. This modulates time and speed in profound ways. When you hold your breath, your time horizon is minutes—and you are limited by the oxygen held in your lungs. Similarly, when you dive on SCUBA, you are limited by the air in your tank. Both of these push you to move slowly and deliberately—to economize your motion to conserve a limited air supply, and to maintain an acute awareness of the passage of time. By contrast, with the compressor, you can forget time altogether. You can afford to move fast, to exert yourself—as well as to slow down and linger when searching for well camouflaged or hard to spot specimens.

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Compressors are tools of labor amplification, transforming the conditions of work and extending the human body at sea. The compressor multiplies the labor power of each diver: one diver can now do the work that would have required two, three, four, or many more free divers. The net effect is an overall rapid *increase* in the labor power expended by divers. But the worry is that the increased efficiency of using the compressor comes with a built-in cost—as the resource base is eroded from beneath you, you are forced to search longer and dive deeper just to find the same amount of coral.

This phenomenon is well understood within the fisheries science literature—which it turns out is more about labor and work than it is about fish. In 2019 at a conservation biology conference in Kuala Lumpur, I randomly found myself sitting across the lunch table at from a statistician who worked on developing "sustainable quotas" for various fisheries around tropical northern Australia. Not wanting to waste my lucky audience, I began to ask him to help me understand how such quotas were established; my primary comparison was obviously the coral fishery, where seemingly arbitrary numbers were passed down from the ministry of fisheries and were divided up among the coral

collecting provinces and companies. I knew these numbers were largely disconnected from biological reality—but how would fishery scientists actually go about establishing the right quotas?

While I expected him to rattle off population biology facts and mathematical equations for calculating sustainable population sizes, instead I was surprised that he spoke primarily of *labor*. Indeed, it turns out for fisheries science, labor is the primary metric by which researchers can detect changes to fish communities. Who knew! Consider a small thought experiment: if a fishing crew comes back with 100 fish from a day on the water on average, and then the next year comes back with the same number of fish, one might infer that this fishery was sustainable—after all, the same number of fish were caught both years. But what is missing from this equation is how much time and work that fishing crew put into their expeditions—how much "effort." Without factoring in effort, fisheries landings are meaningless. To continue our example: perhaps in year two those 100 fish were caught with an average of eight hours of labor, while the year before they were caught with only four. By simply adding in labor time, we can see that the population is actually crashing. Take this conclusion from a recent study: "Catches of coral-reef-associated fishes peaked in 2002 and are in decline *despite increasing fishing effort*, and catch-per-unit effort has decreased by 60% since 1950" (Eddy et al. 2021; my emphasis). In other words, we are working more for less. The return on labor is being slowly but steadily eroded, undoing all of the efficiencies supposedly gained by sophisticated technology. Indeed, that technology merely locks fisheries on a treadmill of increasingly efficient extraction.

It is for this reason—the labor theory of sustainability—that fisheries science has developed a wide vocabulary to understand the ways that changing dynamics of labor and production impact the underlying ecological communities. For example, there is a well-known phenomenon known as "effort creep," whereby fishing crews become gradually and

marginally better at their jobs—more efficient—resulting in on overall increase in labor input into the system, and corresponding decrease in fish stocks.

Here the compressor dynamics make sense: the compressor means *more* work and more "efficiency" in a reductionist sense of the ratio of time:quantity of product collected compared to what a free diver could gather. But suddenly, if that added efficiency means an erosion of the populations, meaning fewer sea cucumbers or corals or lobster, then in effect you are working exponentially harder—often for a much smaller catch. Where a few decades ago one could make good money in an evening of casual freediving to collect sea cucumbers—with leisurely, even pleasant dives in warm, shallow waters—today you must push your body to the brink of ruin just to find a handful. The compressor with its augmentation becomes a trap, a death spiral for living labor and for the living world.

One problem with the compressor is that it is compulsory for divers. Marx long ago demonstrated the paradox of technology under capitalism. The first enterprise to adopt a new technology that makes it more efficient has a temporary boost in its value production, because it is now producing more with less socially necessary labor time. But as competing firms adopt the same technology, the socially necessary labor time for production drops—and soon it is impossible to compete without use of the same technology (Postone 1993). How did we get here? To understand, we need to take a closer look at the organization of production in the live coral trade.

Divers and their Bosses

In 2018, Kendari was likely home to more coral collectors than anywhere else in the world. But collecting coral has become much harder over time. The crew of the *Two Sons* would tell me about how they used to be able to collect good quality corals from the reefs just in front of the warehouse on the outskirts of the city, or along the fringing reefs just offshore. But as Kendari continued to grow and coastal development went unabated, those reefs slowly vanished.

This same story was repeated over and over, though the causes were different in different places. There used to be good coral up north near the border with Central Sulawesi—but the coastal nickel mines did away with those. Then there were the reefs just past Toronipa—but those were killed off by a powerplant that sits on the coast and discharges boiling water directly to the ocean. South of Kendari many good reefs were destroyed to dredge a deep channel for large boats to pass. And then there were the shallow reefs, many of which over time have been blown to bits by fertilizer bomb fishing. Reef by reef, the options for the divers slowly but steadily declined.

The reefs that are left are on the whole much deeper and much farther away. And even on those reefs the abundance and diversity isn't what it used to be. Taken together, these factors mean that divers are sailing farther, diving deeper, and diving longer to find saleable corals. This eats up valuable time—time now spent puttering across the vast bay in search of a good spot, and extra time spent searching underwater. But it also brings a significant increase in the risk assumed by divers: in diving, duration is directly related to risk of bodily injury (for reasons that I'll explain below). And of course, it also takes more money: rising production costs include especially diesel and gasoline to operate the boat engine and the compressor; the farther you travel and the longer you dive, the more you eat into your already meager profits.

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For most coral divers, these rising costs are eaten by their bosses and the companies they work for. For the largest companies in the region, economies of scale helped minimize the disruption of these increasing costs, at least in the short term. This was especially the case for the large national firms with branches and offices distributed across Indonesia—including the company for which Imran worked, PT. Cipta Berkat Bahari, which was headquartered in Bali, with small feeder branches around the country. But for smaller operators this created serious issues.

Imran was in the somewhat unusual position of being a quasi-independent contractor, which made him more vulnerable to rising capital requirements. Some years prior, Imran, aspiring to entrepreneurship, had quit working for PT. Cipta, and struck out on his own, partnering with another erstwhile employee of PT. Cipta to form a new company they called "CV. Samudra Sakti." Imran would be an equal partner rather than just the labor. But while he was able to supply the corals, his partner was less successful in his key tasks of creating market connections and whispering to the bureaucracy to generate permits and favorable relations with the state. "Good guy… it's just that his way of managing money was 'less good'," is what Imran had to say about him.

When Imran eventually decided to jump ship and return to PT. Cipta, he did so with aspirations of maintaining the level of autonomy that he had enjoyed working for himself at CV. Samudra. He tried to negotiate a new kind of relationship with PT. Cipta—more freedom than a typical "mere labor" employee, but less responsibility than being on the hook for *all* of his own expenses—Imran was sort of like the director of diving and coral collecting. This had worked for a few years. He and the other divers received a modest base salary from PT. Cipta, supplemented by the sale of the corals to the company. Imran, who had brought his own boat from his time at CV. Samudra, was responsible for boat maintenance. The company covered recurring operating expenses—especially diesel and gasoline for the boat and compressor engines respectively.

Imran and many other divers spoke fondly of the glory days of PT. Cipta, with its huge Kendari fleet turning over the wildest, most beautiful corals in the world. But then a few years ago a new general manager took over operations for the company, and he was hellbent on cutting production costs. Immediately the monthly base salary was eliminated (this is when many divers decided to go work for other companies). Shortly after, Imran had asked the company for a new wetsuit—a very modest investment in a crucial piece of safety equipment for someone who is rummaging around on the reef floor. The "stingy"

manager offered to supply it on credit, with interest, paid in monthly installments cut from Imran's payouts. Imran refused on principal—evidenced by his own threadbare and ragged wetsuit that he got as a hand-me-down from his brother-in-law, who worked for a different company. He's asked for new masks, for a new regulator for his number-two diver, pieces of equipment which would cost less than $100 all in and would very plainly increase diver productivity (after all, both breathing and being able to see would seem to be important) but been stonewalled.

It kept getting worse. When the old, generous manager would visit Kendari, he would take the divers out to eat at nice restaurants and make sure they had everything they needed; by contrast, when the new stingy manager came to visit Kendari, he bought them cheap, stale, pre-packaged rice from the side of the road—Imran was so offended by the disgusting food that he yeeted his portion into the sea. To emphasize their discontent, Imran told me that when the stingy manager went for surgery in Jakarta, all the employees, only half-jokingly, said they were praying for his death to end their suffering.

Perhaps the worst slap in the face was that PT. Cipta had stopped paying THR or "Tunjangan Hari Raya," a holiday bonus paid to all Muslim employees in advance of Idul Fitri, the most important Islamic holiday in Indonesia that marks the end of the fasting month of Ramadan. More than even a hurtful slight, failing to pay THR is technically illegal in Indonesia—a violation of labor law. The move was made worse by contrast to the generosity of the other companies, who not only paid generous holiday bonuses, but made large donations to the village mosque, and sent gifts to families across the village. Imran was so embarrassed by his company's neglect that he made his own donations to the mosque, out of his own pocket.

Indeed, PT. Cipta's stinginess was often juxtaposed with another large company which everyone agreed boasted among the best labor conditions—a company called "PT. Intan Biru Sejahtera." They all get a monthly salary, plus the money from selling coral, plus

a generous THR for Lebaran, plus an annual bonus calculated as a percent of what they brought in that year (figured by boat, then divided among the crew). Plus, this company has the biggest, nicest boats, well maintained equipment including nice wetsuits and masks and fins for each diver, and perhaps most importantly—powerful, well maintained diving compressors with high quality filters to reduce exposure to harmful chemicals.

I eventually understood that for Imran and the other divers, this was about negotiating relationships of care on the part of their bosses—articulated through local expectations and forms of responsibility and obligation that one has to neighbors, kin, and colleagues. Part of this expectation is the understanding that patrons—bosses, leaders, and important men who rely on the work of others—will take care of the workers and their families whose labor keeps them in their privileged positions.

And many of these discussions and demands for care were also centrally about the *bodies* of the divers themselves—as seen with the concern over wetsuits, diving masks, and air filters. Imran told me that divers from one of the biggest companies in the region were paid to take regular trips to Makassar to take a "ride" in the hyperbaric chamber there to treat any lingering issues with decompression sickness. Imran told me that in his more than 20 years diving, he had never had that same luxury, even when he has had acute, life-threatening cases of decompression sickness, or DCS for short.

Imran had one bad case of decompression sickness during my research, and about a year before my arrival he had what sounded to me like a near fatal case . He had an extreme headache, couldn't open his eyes, couldn't balance or walk, had serious pain, and was laid up in bed for three months, unable to dive. Even now, he still sometimes has neurological symptoms like headaches, dizziness, and sometimes loses his balance when walking. Imran was known for blinking his eyes extra slowly, in a way that made it look like he had to consciously think about it—this too was a lingering effect of his injury. Yet never once did his boss think of having him sent to the chamber to be treated.

Imran's position was that PT. Cipta had failed in its duty of care—but that the damage of the cost-cutting efforts was even more pernicious. Aside from personal insult, the economic result of the company's failure to invest was clear: PT. Cipta was on the decline, both in its languishing local offices and in its overall corporate trajectory. By failing to maintain the best divers and equip them with the right equipment, they had gone from the country's oldest and largest and most prestigious coral supply company, with an armada of diving boats in Kendari, to a slow, sad operation kept afloat only by Imran's sheer force of will and the motley crew of the *Two Sons*.

One of the key problems was PT. Cipta's failure to keep up with the fast-moving trends and shifts in taste—the ceaseless desire for novelty—that sustains demand for corals. Imran has a good eye for excellent corals—and often finds unusual specimens that don't yet fit neatly into an existing commodity category, and would be better off treated as unique "super" corals and sold for a high price to a well-to-do collector or to a boutique operator who could propagate them. But PT. Cipta's model is based on volume—regular supplies of high volumes of corals in colorways that were sure to be popular—like the goldfish of the coral world. They apparently didn't have the skill or market savvy to move these unique corals at the kind of prices that they could fetch from the right buyer. Imran often complained about bringing them amazing corals only to have them totally ignored or bought for insultingly low prices. PT. Cipta simply didn't know what they had.

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Imran often gets an order from PT. Cipta for a certain kind of coral, sometimes in high volume, oftentimes even stipulating the color that they want. Increasingly, he has to inform them "sure, I can find them. But it means needing to travel to the right spot—so we need extra capital for the fuel, and extra supplies so we can stay overnight until we get enough." And his boss will say things to him like "Oh but can't you just find them around here? Why do you have to go so far away?" Imran answers them with frustrated amusement at their

lack of understanding of the reality of what is happening to the reefs in the area. "You can't find these corals in large amounts in Kendari anymore… it's not like it was before." Indeed, the crew would often go away for long, multiday trips to islands in other parts of Southeast Sulawesi to fulfill these orders, staying in local villages or sleeping on the boat. Getting a cash advance to pay for these expenses was like pulling teeth.

These tensions over the nature of Imran's relationship with his company were most clearly visible in the fight over the aging compressor. After the boat, the compressor is the most expensive and important piece of equipment needed to keep the coral economy flowing. Its replacement cost is very high. Imran appealed to the company that he needed a new compressor; without it, they wouldn't be able to keep diving. The company tried to insist that the compressor was Imran's own responsibility to maintain and replace. This fight dragged on for months, and the period during which I first joined the crew of the *Two Sons* at sea was marked by the daily struggles of coaxing the aging compressor to life and dealing with the risks and dangers it posed as it slowly broke down. Imran didn't have the money to replace it outright—he was spending too much on ongoing maintenance for *the Two Sons,* and already failing to keep up with expenses related to its upkeep.

Imran was stuck in a double or triple bind. He used the phrase "half-dead" or "setengah mati" to describe his situation—a common turn of phrase in Southeast Sulawesi that describes the everyday challenge of making ends meet. He needed cash to buy a new compressor but couldn't accumulate that cash without the new compressor. Taking on debt was too risky—his margins were already too thin as it was because of ongoing boat maintenance costs. The obvious solution was for the company he worked for to supply it as an ordinary operating expense. "The bosses don't understand that if they don't get me a new compressor, they're not going to have anything to sell," Imran told me. "In the meantime," he said, "we're half dead at sea."

Far from an equal partner, Imran felt like he had somehow managed to find himself in the worst of all positions. His desire for autonomy and independence—for the respect and equality of being a partner, rather than a lackey—had been leveraged against him. Because PT. Cipta holds his collecting permit, he is stuck working with them for the time being. But the permits were renewed annually—and other companies had tried to poach Imran's talent over the years. So why didn't he switch teams? I never truly understood this. The closest answer I could find was that perhaps it was a choice to maintain autonomy over his own labor—to guard his own leverage. Or perhaps he maintained a sense of pride as an ostensibly co-equal partner which was a relic of more prosperous days when he was the head of a small fleet of boats and many divers, where money came easily, and he answered to nobody but himself. Those days were gone by the time I arrived—but who could argue with trying to hold on to whatever inch of autonomy you had left?

In February, as deliveries lagged, Imran finally convinced his boss to let him borrow a different compressor temporarily. This held the crew over for most of February and March, before he had to give it back—returning to the decrepit shark for several weeks in what was the peak coral diving season when the waters were still calm before the Eastern Monsoon would begin, what locals call "wave season." Then, in April, a new compressor eventually materialized. My memory is that Imran paid out of pocket, but I am not certain; in the end, he may well have convinced his bosses to shell out for the equipment in order to keep the corals flowing. But the saga of the compressor illustrates the delicate situation in which Imran found himself, walking a line between an independent operator, an equal, a patron in his own right—and an employee, a little guy, deserving of support from his boss.

Aside from PT. Intan, the other company that everyone respected was PT. Nusa Jaya Karunia, which was founded and run by a man named Pak Anto, a Javanese man who got his start as a coral diver before working his way up to become a big boss. PT. Nusa had branches in Kendari and in Bali. One night while drinking pongasi with more than a dozen

divers from different companies, they told me all about him. Everyone liked Pak Anto, because he modeled the role of the generous patron who took care of everyone—not just his staff, but their families and their communities. One diver told me that he wouldn't know the meaning of the word "chamber," referring to the hyperbaric chambers used to treat decompression sickness, if it wasn't for Pak Anto. The explanation for why he was such a good boss was simple: he had once been one of them. "It's good if the bosses go to sea so that they understand not only the "sweetness" but also the "bitterness" of diving work," one of them said. I asked him "what is the sweetness?" I meant this as a serious question, but it was taken as a joke—and everyone laughed. One diver offered in jest: "The sweetness is when you're back on land! And paid! At sea you're just in pain."

But then others jumped in: the thing about diving, they explained, was that once you are used to working at sea, it's not easy to switch to something else. You get used to sense of freedom, for one thing—not to mention the regular infusions of cash. Indeed, one of the divers joked that although he has an orchard, he never works in it—he just plants stuff and lets it go, hoping for the best. Many of the divers, including Imran, stayed quiet at this part: they didn't have their own land, nor was there any left to acquire. The sense of self-ownership and pride that comes with being even the smallest of small holders, even the most petit of the bourgeoisie, with just a little patch of land, was something they didn't have access to. Instead, they had their boats, their compressors, and their life at sea. At sea they could aspire to the freedom of being in charge, of calling the shots, of deciding their own fate.

Disrepair at W**ork**

It's hard to imagine a less fortuitous start to the 2018 coral season than was had by Imran and the crew of the *Two Sons*. Nothing seemed to be working as it should—not the government permitting system, not the compressor, nor the boat itself, nor Imran's own body.

First, for starters, the coral season, which normally opened in February, had been mysteriously delayed. Although the annual "harvest quotas" had been issued normally, the actual "izin tangkap" or collecting permits had been inexplicably held up within the black box of the state. The permission didn't materialize until over a month later, in March. This was a source of immense frustration: although everyone knew that the permission was pending, nobody could *technically* proceed with coral gathering.

However, this technicality didn't stop most of the coral companies, who decided to get a head start on the season after the quotas were issued—and indeed some had never stopped collecting since the end of the previous season. This sneaky diving wasn't hard to do for large companies with big warehouses and large holding tanks, or for those with big coral mariculture farms. As "inventory" corals are fungible within their categories; there was little to no way to know if a coral was recently collected or if it was "old," having been sitting untouched in the warehouse or growing on a mariculture rig. Many of these bigger companies had even completed an auditing process that placed them in a privileged "fast lane" for quarantine and inspection of their shipments—so there was very little scrutiny of their products. In reality though, they came straight out of the sea and into boxes to be shipped.

Imran, however, was in a different boat. Collecting corals out of season was dangerous—if you got caught by the wrong kinds of cops or the coast guard, you could sink the whole business. "That's why PT. Cipta doesn't want to take the risk," he told me in February as we watched other coral collecting boats sail across the bay. Other companies had the safety net of personalized relationships with the various state authorities that would allow them to minimize the consequences of being caught—but Imran and a few other small companies were more vulnerable. So while his friends got to work collecting corals, Imran and the *Two Sons* spent all of February and half of March patiently waiting, and collecting ornamental fish in the meantime. It felt like the machine for generating and

dispensing state permission was broken. And to make matters worse, nothing else was working properly either.

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The physics of the compressor are complicated but suffice it to say that because water is much more dense than air, the pressure increases rapidly the deeper you go, and your air supply must therefore be pressurized to match. If you just stuck a hose underwater and tried to use it like a snorkel to breathe, your lungs wouldn't be able to overcome the ambient water pressure and generate enough suction to draw in air, and you would asphyxiate. Instead, the compressor blasts high pressure air directly underwater with deceptively simple technology: imagine a syringe or a turkey baster, and you have the basics. You draw air in, and then forcefully expel it out at increased pressure. The air passes into a reservoir tank, through an outlet valve, down the leaky hose, and by the time it flows through a simple mouthpiece regulator and into your airway, it arrives at ambient pressure. You breathe.

But now imagine if the compressor was falling apart. In theory a brand-new unit similar to the one Imran used should be able to support 2 or 3 divers to a moderate depths of 20-30 meters with sufficient air supply for all. But Imran's compressor was "bocor," or "leaky." Not only did the engine not run at full power, but at every junction—from the corroded reservoir tank to the hoses with ill sealed fittings—the air lost a little bit of pressure.

In January, on my very first trip to sea with the *Two Sons*, the aging compressor's failures were on full display. Imran and his cousin-in-law Salim were diving for ornamental fish. Fish are more difficult and dangerous to catch than live coral, namely because they can move. After only a few minutes, Salim surfaced. The pressure coming through his regulator wasn't strong enough; instead of effortlessly flowing into his lungs as it would on the surface, he had to suck the air like he was breathing through a straw, and this causes pain

and compression in your chest. He knew that Imran must be experiencing the same, and since Salim was less skilled, he surfaced both to give more air to Imran and to give himself a break. But the work of two people was now on the shoulders of just one.

Later, Imran confirmed that he was indeed "half dead" during that dive. He would follow a fish and be close to catching it, but then the fish would drop down deeper, and he couldn't follow it because the compressor wasn't strong enough. He would try to descend and feel choked by the lack of sufficient air pressure at depth. The ailing compressor just couldn't deliver.

At the end of three long days of diving, Imran' team headed back to Kendari without much to show for it, after mostly losing their battle with the compressor. Again, since the coral season hadn't yet opened, the team was only collecting ornamental fish—and looking for one kind in particular that was requested by the boss: redheaded wrasse (*Halichoeres rubricephalus*), a small, rare species of aquarium fish known only in a handful of places in Indonesia. I counted 24 of the fish, which they would sell for 15,000 rupiah each. The team splits up the money they make, with divers getting a larger share than those who don't dive, and half of the haul going to Imran, who owns the boat and the gear. But in this case, his share will be less than 200,000 rupiah, less than $15. Not much for three full days—and after expenses, there was almost nothing left over for the many badly needed repairs to the *Two Sons*. Indeed, that same morning as I stepped onto the boat, one of the floorboards cracked beneath my feet. It was not broken yet, but like the rest of the vessel it was well on its way.

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Boats occupy a unique position in the coastal economies of Sulawesi. They are treated not unlike cars or motorbikes: essential forms of transportation that also enable economic opportunity. Also like cars, they are depreciating assets for which ordinary people pay large sums of money—you need to leverage your boat aggressively in order to avoid losing your

investment. People often spoke of their boats as assets, as key means of production, including Imran.

But this strategy of investing in a boat as a productive asset is risky. Boats are expensive, both upfront and in terms of ongoing maintenance and fuel costs, and the risk doesn't always pay off, as illustrated by the story of a young diver, Fildan. Fildan was connected to Imran by lines of affinal kinship (brother-in-law to Armin, Imran's wife Lidya's brother). Fildan had been diving since he was about 14 or 15, was married at 17, and now at 20 had a young child and the air of someone much older. He owned the boat which the team used for fish and coral. At the suggestion of a family member with an entrepreneurial bent, he saved up money from collecting coral and invested in buying a boat which then could be used to go collect more coral, and which he could hire out to the local coral company, PT. Intan. Adding this boat to PT. Intan's fleet would earn him an extra commission in addition to the other usual money paid for crew members. But it was an expensive investment, 20 million rupiah (about $1,500), mostly paid in two installments, with just over one million outstanding. Another 10 million for all the compressor, hoses, masks regulators, etc. So about 30 million, or about $2000 total—a huge amount of money. His timing was terrible: just a week after he bought the boat, the coral closure was announced, tanking his entire plan. "Right now, it's just enough money for us to eat, nothing to save," he says. Instead of gathering coral, he and his crew were gathering ornamental fish. It was something, but very little compared to the money he could make gathering coral. With coral, he explained, "we could save a few million in a month." But now "it's zilch."[43]

While, Fildan's boat was brand new, the *Two Sons* was not, and over the course of the year. I watched it slowly fall apart. The most vexing issue was a series of leaks in the hull. The electric bilge pump that Imran installed had short circuited—and with the coral closure, there wasn't enough money to buy a new one. This meant that the water had to be

bailed out by hand several times each day. In the middle of the night, I would hear Imran creep out of the house and onto the leaky boat, lift away the softening planks of the deck, and bail out the water using a scoop made from an old plastic jug.

It was a Sisyphean task to hold back the water without the capital resources to make permanent repair. As more pieces of the boat fell apart, Imran had to decide whether to keep throwing money into the *Two Sons*, or whether to invest in a new boat; either choice would require taking on new debt, but Imran couldn't afford to be without a boat. He had no land, no other way to make a living: the boat was his only asset, his only way to generate cash. In the end he decided to purchase a new, much smaller boat—he got a good deal because the seller needed fast cash to pay for his son's wedding. By the end of the year, the *Two Sons* would be languishing, half-submerged in the shallow, muddy mooring in front of Imran's house.

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When the coral season finally opened in mid-March, I came back to Nambowatu after being away for a week to scenes of disrepair. All of the other diving boats were out collecting, except for the *Two Sons*. The engine had given out, and Imran and the crew were busy taking it apart, searching for the broken piece. The *Two Sons*, like many other medium sized boats in Sulawesi, was equipped with an enormous crank-start motor, which were often described to me as "Chinese truck engines." Though they seemed like antiquated technology, they were actually more recently arrived than the more sophisticated appearing outboard motors. Outboard motors were extremely rare in Kendari—a sign of wealth. These crank engines were much cheaper, by a factor of 10—though they were prone to mechanical issues.

Figure 10 (Left): Rigging up a tarpaulin sail | Figure 11 (right): Repairing the *Two Sons'* engine

By evening, they had completed the repair—but the engine was the least of their worries. After the crew packed up their tools, they told me that the week prior both Imran and Salim developed a serious case of decompression sickness the week before while diving at Saponda Laut. Imran couldn't open his eyes for the whole day, and was still having trouble walking normally. Salim, the other diver, was still sick—so a different diver was brought on board. They couldn't afford to rest—the crew needed money now more than ever. So the next morning we hopped on board and headed across bay to search for corals at a lighthouse on the other side of the Moramo Bay. Though I had been to sea with the boat many times by then, this was the first day that I got to watch them collect coral, something that everyone had been waiting for. But the mood was somber.

The old compressor was back; Imran had to return the one he borrowed from his boss. It was decrepit as ever, falling apart right in front of us, literally: the machine shook

so severely that at one point a hexagonal nut flew off and landed in the water. Trying to remedy the horrible leaks from his air supply hose, I watched Fahad use a broken rubber band to try to create a gasket for the connection to his regulator mouthpiece; it helped, but a steady stream of bubbles signaled that the leak remained. Both divers struggled to breathe as they searched.

Given the circumstances, they came back with an impressive haul. Imran found loads of an Acropora with smooth golden-brown branches and luminescent purple tipped polyps. He expertly harvested it not by breaking off pieces of a branch, but by chiseling away substrate and taking an entire small colony—he probably collected about 30 of these—with no breaks or blemishes. They looked like little bonsais. Then there were "hand corals," "brain corals," "plate corals," and "pineapple corals," in every color of the rainbow.

On the way home, however, the boat's engine gave out again—stranding us in the middle of the bay. Imran and Fahad descended below the cockpit to the engine. In the distance, we saw what looked like another diving boat; the crew strained their eyes to try to see who it was. We waved the bright white lids of the styrofoam coolers, and shouted as loud as we could—but to no avail. The boat left without having seen us. Alone in the water, the crew unfurled a huge blue tarp, and tried to secure it to the boat as a makeshift sail, as if we could catch the wind back to Nambowatu; they figured that even if it didn't work (which it didn't) it still conveyed the message that we needed help to any passing boats.

We drifted that way for a few hours, before Imran managed to goad the engine into a sputtering, clunky sounding half-alive state—and we scuttled along that way for an hour before another dive boat finally came around the peninsula and agreed to tow us home. The *Two Sons* would be out of commission until the engine could be rebuilt.

A Clandestine Delivery

The legal architecture of the coral trade made it so that it was illegal for divers to collect coral for anyone other than their boss. Bosses hold the permits, and therefore the power. Yet even this system didn't stop divers from going rogue on occasion.

I had the chance to join another group for a few days of diving, led by a diver named Guntur, who worked for a large company, but also owned his own boat and equipment. For a week we were scouring the reefs for bosses for Guntur's boss—who held his permit. Like Imran, Guntur had a challenging relationship with his boss—so when he answered his phone early one morning as we were getting ready to set off, and began laughing and joking, I knew he was talking to someone else. It turned out to be one of the company owners, Mas Indra, a Javanese man who owned one of the smaller companies. "Red mushrooms? Red mushrooms, ok. Yeah we can do it… we already have orange ones… with green edges… maybe 15 of them? Ok we're gonna go again today." The order was in: 200 mushroom corals, preferably red ones. "We'll find you a balloon mushroom too, if we're not too lazy!"[44] Guntur joked, referring to the rarest and most valuable coral in the world.

One of Guntur's perennial complaints about his boss and his company is that they wouldn't buy his *jamur* corals: corallimorphs. The Boss doesn't like jamur, but Guntur can sell them to Mas Indra for a good price; he really likes jamur, and he knows how to sell them. Guntur knew that these were all the rage among coral collectors—the hot new coral. This meant that there was a narrow window in which demand was high but supply was limited for these corals—meaning high prices for those willing to market them. So if his boss wouldn't buy them, why not take them to another company who would? There was no harm: since the permits and quotas were held by the bosses, no extra corals were collected that wouldn't have otherwise been taken. He would do it—but it would have to be secret.

With jamur on the mind, Guntur knew just where to go—pointing the bow of his oat in the opposite direction, to a small island near the muddy, mangrove estuary of the

Laonti River. As they drank coffee and smoked cigarettes, Guntur's crew tells me stories of getting lost in the labyrinthine river, trying to navigate with only the flashlight from an old Nokia cell phone. The proximity to the estuary meant that visibility was horrible—probably the worst I saw in Moramo Bay, about 5 meters or less. Pea soup, a yellow-greenish tinge to everything. What would they be able to find in this mess?

Quite a bit, it turns out. I was shocked at the coral they brought back from that first dive, all these mushrooms in all kinds of colors: blue and green in a camouflage pattern, bright orange mouth with fluorescent blue ring, and yellow-green with pink centers, and a rainbow one with pink, green, blue, and yellow—to name just a few of the color patterns I managed to snap photos of. In the end they didn't get 200, but they got about 80 mushroom corals—not bad for one hour. These mushroom corals were growing on everything! On a clam shell which took a while to pry out of the substrate, and even on top of other corals. The team dived twice more that day, and continued diving for a few more days, filling the orders for Guntur's boss and for Mas Indra simultaneously. On the 5th day, after a morning of diving, the time came to make a clandestine delivery of Indra's order.

To finish the job, we picked up one of Indra's employees—his trusted "coral picker," Eddie, who lived in Nambowatu, before we travelled to the spot where the team had been stashing their corals. When the coast was clear, Guntur and Eddie descended with an empty plastic crate. Forty minutes later they returned to the surface with a treasure trove. With the goods, we set off for the mainland—and I had no idea where we were going. Guntur usually delivered his corals to a warehouse near the old part Kendari, but today we were heading in the opposite direction—sailing not for a town, but straight for a small fragment of a mangrove forest. As we got closer, a newly constructed wooden jetty came into view. This off-the-books transaction required an off-the-map location—and this sheltered mangrove forest jetty, far from the prying eyes of anyone's boss, was the perfect spot.

We quietly off loaded the boxes, 3 of them, mostly mushrooms, onto the lowest step of the dock, just out of the water, as the evening light began to fade, the tide was quickly falling, being sucked out to see by the impending ascension of the full moon. To avoid getting stranded, we had to pull back the boat, and left Eddie with the shipment. Once the pickup-driver arrived, he would wade out to us, carrying the empty styrofoam coolers (these were precious tools—and they had Guntur's name on them, so he needed them back for practical reasons as well as to avoid incrimination). We waited for two hours in the dimming evening light: it was nights like this that got divers to speak about adventure, love, heartbreak, and fortune—dreams of the future and fantasized versions of the past.

The sun was down for a while when a fire-red beam peaked out from the sea next to Pulau Hari, between it and the Tanjung Peropa peninsula. A blood red, huge, full moon. It was horrific and awesome and beautiful. Its attraction was immense—you could feel the water being sucked out from under the boat. It was bathing the sea in orange.

We had been so distracted by story time and by the moon that the crew didn't notice that the boat had stopped rocking. Indeed, by the time Eddie came wading through the water sometime after 7pm, we were stuck on the newly exposed reef. We all hopped out to push the boat off the reef; Guntur threw the anchor in front of the boat and we pulled ourselves toward it. By the blinding light of the moon we navigated through the maze of the shallows of the reef at low tide. Half an hour later we were crashing over the waves when we landed with a thud: stuck again on a reef in the middle of the bay. More hopping out, more pushing, everyone except me either grabbed or stepped on a sea urchin.

But despite mishaps, the delivery was a success. Mas Indra got his mushroom corals, the divers and crew got a badly needed windfall payout, and Guntur's boss would never know. This time the risk had paid off—and Guntur's crew had successfully navigated the systems of permission and power that made this transaction illicit, just as they had navigated the dangerous reef shallows.

Figures 12 and 13: *Jamur* ("mushroom") corals, *Ricordea yuma*

Figure 14 (top): A token of fortune (possibly *Oulophyllia*) | Figure 15 (bottom): A successful haul aboard the *Two Sons*

It was the first time I really understood the pleasure of adventure and the thrill of landing a big fortune, returning home triumphant in the middle of the night, plowing through huge waves, blanketed by a warm breeze, mesmerized by the blinding brilliance of the moon over the mountains on the peninsula, the feeling of being very much alive, of gratitude for this strange confluence of circumstances that put each of us here on this little boat in the middle of the Banda Sea. It would become a story to tell—it fit neatly into the genre of masculine tales of bravery, of adventure and exploit at sea, where you laugh in the face of authority and defy the tides to pull off a heist (Cf. Lowe 2006). This was a good story *because* of the risks and dangerous involved, and because the divers skirted them, coming out on top.

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Navigating authority and economies of permission is a big part of the work of coral collecting, as seen in Guntur's case. Indeed, one sub-genre of adventure story is "cop stories." Every diver has their own cop stories—of being harassed and waylaid by "petugas," the umbrella term for the "authorities" that covered all manner of cops, different branches of the military, and any other state agent on a boat. You always had to be ready to show your permits to the state. But as I was frequently told, the right letters don't always protect you from extorting cops. Imran later told me stories of being at sea with his boss, who always travels with a bunch of envelopes with thick bills inside to doll out to bothersome policemen as "cigarette money" but in reality each envelope was stuffed with 1,000 Rupiah notes (worth about 6 US cents each), so that each one had maybe 30,000 total (about $2). Imran's boss knew that the police wouldn't check the envelope right in front of them, so they passed it off and sped away laughing.

Indeed, my friend Hamzah, part of Imran's extended family, who we briefly met in chapter 1, told me similar stories. Hamzah was young and ambitious and an entrepreneur. He was a skilled coral diver, and with the help of his brother, who was a successful doctor

in the city, he had started his own coral company. Hamzah told me that when he takes his coral to his warehouse across the bay on the mainland, in a small village just south of Kendari, he doesn't go straight there with his boat, even though this would be much easier and more direct. Instead, he crosses to a different, more remote village, and then moves his goods to a truck, which then goes to the warehouse. He explained that this was "safer, less risk." The reason for the circuitous journey is to dodge the police: the boat is *much* more likely to be stopped if heading closer to the city. Hamzah explained that he doesn't yet have a strong enough social network to get him out of tricky situations were he to get stopped by the Kendari water police; he explained that he doesn't "know" the authorities there yet, where, by contrast, he already knows all of the different authorities who have jurisdiction in his usual drop-off spot. To be clear: Hamzah has all of his permits in order, a fact of which he is very proud, and an achievement which took several years of hustling and spelunking in forgotten corners of state bureaucracies. But this didn't matter to the water police—who took it upon themselves to extract rents from any boat they chose, especially those with whom they didn't yet have a working relationship.

A few months after this conversation, I returned to Nambowatu after being away for a week. I arrived just as Imran and the crew of the *Two Sons* had returned home after a long collecting trip. We sat outside in the cool morning air and had coffee, while Imran calmly mentioned that he had been "captured" by the water police on the way home. They had been collecting corals in a strait that separated the Sulawesi mainland from Imran's home island of Wawonii, and were sailing home when they were intercepted by a police boat. It didn't matter that the boat was from Wawonii, not the Sulawesi mainland, and therefore nominally didn't have jurisdiction. Who would they complain to?

It turned out not to be an isolated incident: the Wawonii water police had gotten wind that collectors from the Kendari area liked to gather coral in the strait, and sensed an opportunity. They had also arrested Hamzah's boat, as well as that of two other coral

companies. It was a coordinated show of force for a coordinated demand: the police wanted each coral company to pay them "permission" money of 1 Million IDR per month—from all 10 active Kendari companies, for a total of 10 million per month. AKISTRA, the regional coral trade organization, had to call an emergency meeting to address the situation. Imran told me "No way are they getting 1 million a month! … maybe if it was just 200,000, that would be ok."

Imran was resigned: paying the cops was just a cost of doing business, just one of the many difficult to anticipate factors that could interrupt their work, like bad weather or a malfunctioning compressor. The cops were like political weather—you hope it doesn't happen, but you're not surprised if it does. But still, I could hear the indignancy in his voice: why bother going through all the trouble of getting permits, of waiting for the season to open, of doing everything by the book—if they would be arrested anyway? But navigating these forms of power, permission, and authority was just part of the job—just one of the many forms of embodied risk that divers assume in their work.

The Risks of Diving

All diving is dangerous to some degree, though compressor divers take on an inordinate amount of bodily risk in their pursuit of fortune. One time, Fahad, one of the divers on the *Two Sons*, nearly died when his air hose became detached from the compressor while he was 16.5m (about 55 ft) underwater. He said that he just held his breath and swam straight for the surface. It is something of a miracle that he didn't end up with "cramps," or decompression sickness (commonly abbreviated as "DCS" or as "DCI", decompression "illness")—the condition that nearly took Imran's life, and the most pervasive, pernicious, and dangerous threat facing coral collectors and other divers.

The medical explanation for DCS is that it is a form of barotrauma—in other words, an injury caused by differences in pressure. It is commonly explained by recourse to a thought experiment involving balloons. If you inflate a balloon at the surface, and then

take it underwater to 30 meters where the pressure is four times greater, the balloon will shrink to 1/4 of its volume; when you bring the same balloon back to the surface, it will expand back to its original volume. This is what happens to the air in my lungs when I free dive by holding my breath; it shrinks, and then re-expands. Now imagine that you inflate a balloon at 30 meters, and then bring it to the surface: under the decreasing pressure it will expand four times in volume, and it will likely explode. It is this principle that puts divers in danger when they rise to the surface too quickly after breathing compressed air at depth.

More precisely, it has to do with tiny air bubbles that are found in every tissue in our bodies. Once you've spent a long time at depth, your body is saturated by these tiny bubbles; if you rise too quickly, they expand before they can escape your body, and they wreak havoc. Bubbles in your muscles and joints will cause mild to extreme pain, but bubbles can also do damage to the central nervous system—leading to severe neurological symptoms like those experienced by Imran—loss of balance, trouble hearing or seeing, slurred speech, or paralysis. In severe cases these bubbles can escape into your circulatory system and block blood from flowing to your brain—an embolism—and these instances are nearly always fatal.

Decompression sickness is an endemic risk faced by divers around the world—a risk that is only being exacerbated by declining marine ecosystems that push valuable products deeper and force divers to dive longer (cf. Mallon Andrews 2021). In and around Kendari, every single diver I spoke to indicated that they had experienced at least one bout of "cramps". Neurological symptoms were very common among these divers, including deafness, paralysis, muscle pain, vertigo, balance disorders, and others. Likewise, a high number of divers are killed by both acute and recurrent DCI. Most divers I met considered this to be normal—and understood DCS in particular to simply be an occupational hazard of their work.

The specific species that the divers are gathering also matters. For example, while shallow coral reefs are home to abundant coral biodiversity, the species most valuable and sought after in the trade occur more often at moderate depths of 15 meters or more. To seek these out, one has to go deep—a trick made possible with the help of the compressor. But this depth comes with significant risk and danger for the divers. Worse still is diving for ornamental fish. Fish move, and can swim away from you, going deeper than you might be able to follow. Corals are easier, less movement, less exertion, and thus possibly less risk of DCS—not to mention better paid.

Coral distribution has everything to do with light, which helps to delineate a few "zones" of coral reefs. Some reefs are barely covered by water; at low tide they may even be bare and exposed for hours at a time—these are the shallows which sit atop underwater pinnacles or plateaus, or which fringe the edges of islands or continents. These reefs are often brilliantly illuminated, riots of color and form. Eventually, most of these reefs gradually slope down deeper, and light from the sun quickly fades as it is absorbed by the dense seawater. The exact amount of light which filters through is dependent on proximity to the equator and the clarity of the water, but in general by about 10m of depth, over 80% of the light has been attenuated, or absorbed, even in clear water. And so while shallow dwelling corals get on with the business of rapid growth enabled by photosynthesis, corals at deeper depths more commonly employ a mixed strategy of some photosynthesis, and some direct feeding on plankton and other organic matter in the water. The deeper one goes, the more pronounced this shift is. These "heterotrophic" corals often grow and reproduce much more slowly than their shallower counterparts, and tend to have larger polyp sizes, a characteristic currently prized by collectors. There are many corals, highly valued in the trade, that I simply have never seen above certain depths

Imran's brother-in-law Armin told me that there are two kinds of cramps: the kind that hurts, and the kind that doesn't. Better if it hurts, because then you know it's just in

your joints or muscles. “The ones that don’t hurt are dangerous,” he said. “Better if it hurts,” because sometimes cramps give you “mati rasa,” or numbness, where you don’t feel anything at all, a sign of potential paralysis. Some divers lost their lives this way—or were completely paralyzed, only able to move their eyes. “For the cases where there is no pain, there is nothing you can do—except the chamber.”

The “chamber” here is the hyperbaric chamber that was mentioned above—an expensive room-sized machine that is able to generate high pressure inside a specially enclosed capsule to simulate the pressure of diving underwater. By very slowly taking patients to high pressure, giving them high concentrations of oxygen, and slowly depressurizing them, you can rid the body of trapped nitrogen bubbles. But chambers are incredibly rare in Indonesia—there are only a handful in the entire country, and most of those are concentrated on faraway Bali and Java. Besides, accessing them can cost more than most divers would earn in several years of work. And as if access wasn’t already hard enough, both of the nearest chambers, in the city of Makassar and on the island of Wanci—both 12 hours away by car and boat—had fallen into disrepair, languishing unused. For the tens of thousands of commercial divers who work in eastern Indonesia, there was truly no way out.

I asked Armin how divers guarded against cramps. He told me that it's from the way you dive. “Don't descend too fast. Your body is the same as the plastic bottle which gets crushed when you bring it under water by the pressure. If you descend too fast it steals your breath, squeezes it out of you. And don't come up too fast, and don't go to long. Do deep first, then shallow.” Armin’s explanation here was similar to other ways that divers explained safety to me, and it contains some elements of the rules drilled into every new SCUBA diver, leftovers from a safety lecture they had all been made to attend once several years ago. But in the most important part it radically misses: the most dangerous part of a dive is not the descent, but the *ascent*, with its capacity to cause gaseous expansion in the

body. When I try to explain what I know, Armin nods in a disinterested way before repeating that the risk still remains: “Dive masters have rules, but we don't.” Besides, this basic safety rule interferes with the frequent up-and-down way that most divers work, where they make repeated ascents and descents within a single dive.

The worst part of this scenario is that avoiding DCS is not hard: millions of recreational and professional divers around the world do so every year. But it requires some basic safety equipment, and fundamentally conservative approach to diving—restricting the time you spend at depth, ascending very gradually, and always, always, completing a non-negotiable “safety stop” at 5 meters depth to allow any remaining nitrogen to escape. Plus, most recreational and commercial divers wear diving computers which automatically calculate your risks of DCS and instructs you on when and how to ascend safely.

None of this is available to coral divers. Diving computers are expensive, and they would so severely limit your dive time that coral collecting as currently practiced would be impossible. Coral bosses eschew the costs these would represent, and divers don’t feel they can afford to waste valuable time on basic safety. The drain on capital by this kind of labor cost is instead deferred onto the bodies of the divers, for whom the cost-savings becomes bodily risk which pervades every part of their work, saturating their every tissue.

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There is also more to “cramps” than simple physics and biomedicine. Most divers see a complex etiology for decompression sickness. It is a disease that is simultaneously caused by playing fast and loose with oceanic pressure, as well as by overstaying your welcome in the realm of the spirits.

I was told early in my research that if I was to come along on diving trips, I needed to take care what I touched and to pay respect to the sea and its guardian spirits. The trick to this is that the “penjaga laut,” or “sea guardians,” shift in their form: you never know in which creature or landmark they have taken up residence. These beings are flexible, and do

not stay fixed in place, nor fixed in form. If you take the wrong coral, the wrong fish or lobster, one that is the special provenance or avatar of the guardians, you face grave peril and possible death.

For example, they told me, if you see a moot of sea cucumbers gathered in a circle, and one is standing up vertically on its hind legs, do not under any circumstances touch that sea cucumber. This specific case was not a hypothetical example, I later found out, but a specific recounting of an episode that happened to one of the best divers in the area, Latif, a diver from Central Sulawesi who moved to Kendari to work as a diver. While diving for coral, he spotted a cluster of valuable sea cucumbers, and began to toss them into his net bag; when he removed the leader, the sea cucumber which was reared up vertically, he was suddenly stricken with intense pain, and cramps racked his body. Later that day on the surface, he became deaf.

Imran had experienced something similar. For this reason, before he dives, he always stops and offers a prayer in the silence of his heart, asking for permission and safe passage from the guardians of that reef. He explained: "It's like if you, Joe, have something and I just take it. I shouldn't do that. I have to first ask for permission (I: "Tidak boleh. Harus pamit dulu."). Imran's prayer is a simple one, the core of which is: "kita sama-sama cari rejeki," We are together looking for fortune. Through its language of sameness and togetherness, sama-sama, this prayer both creates a mutual identification between the divers and the sea guardians as pursuing similar, yet distinct interests, as well as inscribing the spirits as *laboring* in a sense legible to divers—of looking for their own luck, protecting their own livelihoods and those of the reef. Still, the effects of impropriety are corporeal—striking the material body, augmented by the compressor—as it wanders into places where it is not welcome.

A few months after I first arrived in Nambowatu, a girl went blind. She was a high school senior from an important family in the village who was at the top of her class and

with a bright future ahead, getting ready for exams at her high school in Kendari when she was suddenly stricken. One afternoon she lay down to take a nap, and as she fell asleep, she had a dream that a fuzzy caterpillar crawled inside her nose, and when she woke up, she was completely blind. She had been poisoned, the target of malicious magic on the part of jealous classmates. That day she returned to the village, where word of her affliction had spread quickly. Her parents tried everything—taking her to the doctor, to local healers—all to no avail. Finally, through a family connection, they were put in touch with a Muslim cleric and healer in Ambon on the other side of the Banda Sea, who cured her over the phone, whispering words of benediction into the tinny speaker of his Nokia, spitting on the microphone. After 8 days of darkness, the scales fell from her eyes.[45] As it happened, a bizarre lightning storm was raging overhead, illuminating the dark houses in flashes of brilliance. Between the claps of echoing thunder came shouts, being passed like a wave down the length of the village, jumping from one house to the next: "She sees! She sees again! She sees!" Soon the entire town descended on the girl's house to see the miracle for themselves.

That night I sat with Imran and his nephew-in-law Jono, waiting a while before going over to join the crowd. The scene had prompted Imran to tell his own stories of affliction and healing. These were actually stories which I had heard before—the stories of him getting "cramps," or decompression sickness. But now they were being re-told with an added layer of narrative, an extra layer of truth and indeterminacy.

When he was in Palu, in Central Sulawesi, collecting coral, Imran was diving in a place they had traversed many times, a place familiar to him. But then, he noticed an unusually good specimen—a brightly colored babut coral (commonly called "frogspawn," *Euphyllia divisa*, named for its iridescent and multicolored fleshy tentacles)—and he took it. Immediately he was besieged by cramps, blinding headaches, dizziness, and ringing ears. He had to leave the water, and was badly, dangerously sick. Imran explained: he had

wandered unknowingly into a sacred place and taken a coral which had belonged to a sea guardian. Perhaps the spirit had planted the coral, willed it to grow, like flowers in a garden—who knows. After weeks of pain and illness, and after many doctors had failed to help him, Imran was eventually cured by a Christian priest who was also a magical healer, in a place called Kebun Kopi, near the djinn city of Wentira discussed previously. What made this possible, Imran explained, was "yakin," or conviction. He belabored this point to me and seemed to think it necessary to explain why or how it was possible to be healed, which was because he was convinced that it could work, just as the priest was convinced that he had the ability to heal him.

Yakin, or conviction, is not the same thing as belief—and in Indonesian the word "yakin" is often contrasted with "percaya," to believe. Belief is easy—conviction is not. Imran and Jono even offered, by way of explanation, that if westerners like me don't encounter spirits, it's because it depends on your yakin—your conviction. "That's why you don't see them," Imran explained. He, on the other hand, as well as the other divers, encounter them because he is yakin, which is the same thing that allowed him to be healed, and allowed the schoolgirl to be healed over the phone.

Sea guardians often had other material effects, and could even assume human form. Part of the problem is that they can be anywhere, and can be anything—they can express their agency in all manner of ways. Imran knew a man who lost his whole family when their ferry sank near Palu in central Sulawesi, sunk by spirit guardians who pulled the boat onto its side, sinking it. When you have such an instance, it is important to gather all the passengers and crew and count them to ensure there are no extras, no mysterious, un-ticketed passengers—spirits in human form. In Palu, these were seen, three soldiers of unknown origin who were not on board when the ship departed, nor ever seen again.

There's an almost panopticon-esque way that the sea guardians project their power. Divers and others must assume a stance of epistemic humility—because you never

know what form things may take, or what events may turn out to have been caused by the agency of spirits. I felt it too: was that strange sound emanating from a coral bommie the voice of a sea guardian? Or just the hoarse bark of a grouper warning me off? You can't help but be pressed into a stance of indeterminacy.

Imran was once taking the large wooden passenger ferry from Kendari to Wawonii carrying 100 passengers and a full cargo load, when the boat struck a reef and sank. The situation was uncertain. Was this the work of a sea guardian? Or just an accident—the bad luck of an overweighted ship colliding with the agency of a coral reef? Imran didn't know. Afterall, this route was known to be a particularly dangerous one, passing several spots known to be keramat. Indeed, Brooke Nolan (2019) notes that on Wawonii, not just anyone can pilot these boats: only those who know the correct prayers or mantras can be trusted to safely make the crossing. Like divers navigating the protectors of the reef, "prudence when confronted with sea spirits and knowledge of the correct prayers are requirements of the job" (Nolan 2019: 79). As the boat sank, Imran collected empty plastic jerrycans and gave them to his three friends who were with him for floatation. Others climbed on the flipped hull. Everything was lost. 80 bags of cement. Hundreds of kilos of rice and sugar. One woman had just taken out 8 million at the ATM and was heading home—all gone. Imran lost his shoes. Someone had brought 20 cartons of cigarettes; Imran found some floating in the water and snuck them into his backpack. Someone else lost 20 grams of gold—gone to the bottom of the sea. Was it a trick of the sea guardians to gather valuable stuff? Or just an accident? Two babies onboard were rescued by a speed boat, and then two large fishing boats returned for the rest of them. But before that, they counted, of course—exactly 100 people, no extras.

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Imran' grandmother, by his own estimation, lived to the age of 140 years. On her home island of Wawonii, she managed to survive colonization, waves of marauding pirates, brutal

occupation, and the everyday challenges of old age thanks to a robust store of magical knowledge which protected her from political violence as well as the malevolent poisons sent through the air by her many jealous enemies. Her eyes were clear and her teeth intact until the day she died. In addition to Wawonii, she spoke fluent Japanese and Dutch, but never a word of Indonesian: relics of her survival of various forms of occupation and brutality.

For many in Southeast Sulawesi, indigenous techniques for the extending the body's capabilities came not from machines, but from the accumulation of magical knowledge and protective talismans by which one could cheat death. Often these knowledges and techniques are born from the ocean. I heard several times of a man who dove to 1000 meters in the Gulf of Tomini using only his magical skill. Truly powerful divers, Imran explained, could envelop their heads in magical bubbles of air in order to breathe deep beneath the surface. According to Malay chronicles and Persian folklore, it was knowledge like this that allowed Alexander the Great to travel underwater from India to the Malay peninsula (Ho 2006: 155; see also Khazeni 2020: 30).

Indeed, many kinds of protective magic are forged by material artifacts made from the bodies of spiritually powerful sea creatures—like black coral, hawksbill turtle shell, or dugong bone—all of which are made into bracelets and worn on the wrist to protect against poison and black magic. One of my close friends explained to me the efficacy of these devices, which, he offered, work like shock absorbers. His mother went to visit an estranged friend whom she hadn't seen for a long time, and the friend served tea. His mother took a single sip, and immediately her turtle shell bracelet snapped in half and fell from her wrist: the friend had tried to poison her over an old grudge; had it not been for the bracelet, who knows what would have befallen her. In this context, the compressor is just one of a suite of techniques of stretching the limitations of the human body.

Conclusion

In good times, and sometimes even in bad, the work of diving can be pleasurable. At its best, diving offers a sense of excitement and adventure: of searching for your fortune. It allows you to assume a stance of freedom and independence, a life of self-determination, even for those without access to land or capital. It can bring you good fortune, and will certainly give you good stories to tell. But at its worst, when the equipment is failing and the debts are mounting, diving can feel like a trap.

This chapter has argued that under conditions of chasing less with more, the compressor became structurally necessary to sustain the supply chain and livelihoods of divers as they chase corals across the disappearing reefs of Southeast Sulawesi. The compressor has allowed them to dive longer and deeper, to generate the kinds of commodity flows and inventories which keep the live coral trade alive.

Divers are faced with a supersaturation of risk—financial risk that is transmogrified into the bodily risk of dangerous, often deadly work. Their bosses, in hoisting the burden of capitalization on the workers, eschew their own relatively modest monetary risk, which become perils, bodily risks, for their divers. Likewise, as coral reefs decline, divers are pushed deeper, and pushed to dive longer, to make up for the loss. As Kyrstin Mallon-Andrews (2021: 78) has put it when describing similar economies of compressor diving in the Dominican Republic, "Damages outside of the body such as declining fish populations and changing socio–economic conditions are understood as entangled with damages inside of the body—air embolisms." Externalized costs are internalized—within the very tissue of the diver. And yet there is also more to DCS and the risks that divers face than a mere expansion of gas. There is also the growing risk of overstaying your welcome in a place that belongs to a sea guardian, of failing to properly negotiate the economies of permission that create fortune in the first place.

In 2016, I spoke to a village leader on a small island near the city of Makassar about government plans to outlaw the use of diving compressors. The man used to dive for sea cucumber and coral when he was younger—he and the rest of the island community knew well the extreme risks involved with compressor diving, having witnessed it visit injury and death on young divers for decades. Yet he saw the economic risk of lost livelihoods and incomes as far more dangerous. The island's own nearshore fringing reef had been decimated, and local coral collectors now traveled up to four hours by boat each way to find a suitable collecting spots. "If they ban the compressor, how will we live? Here, the compressor is our heart."

Like the aqualung and other mechanical organs, the compressor-as-heart tries to push back at the limits of the body, extending what is possible for human interactions with the sea. But the compressor compels divers to exceed their own limits, diving longer and deeper to make up for the rampant loss of coral reef fisheries. Indeed, the compulsion to use the compressor places coral divers in a position of extreme economic and bodily risk as they work to stay afloat at a time when environmental collapse seems to have no limits.

But what about when the compressor itself—your heart—begins to decay? What do you do when the components of your extended body at sea begin to break down? When the floorboards of your leaky boat crack beneath your feet, and the engine, in its shaking, threatens to launch itself into the ocean? The body and the compressor, locked in mechanical embrace, abandoned by capital, fall apart together.

INTERLUDE
At Home on the Reef

A few weeks after our visit to the shrimp factory, my friend Danial, the anthropologist, continuing his research, invited me along to visit a serong, a "fish fence," owned by a Bajo family that he knows living in Bokori Darat, north of the city, belonging to a couple called Mama and Bapak Fikram.

There are two places called Bokori; "Sea Bokori," referring to Bokori Island just off shore, and "Land Bokori," a village created in the 1980s when the Bajo residents of the island were forcibly removed and resettled on the coast, in the name of their welfare and so that "Sea Bokori," could be turned into a tourist attraction. As "suku terasing" or an "isolated" or "estranged" ethnic group stigmatized for their cultural difference, the Bajo were subject to government policies of forced integration and "development" (Lowe 2006; see also Tsing 1993). Putting them on land was seen as key for their "integration" to national modes of citizenship and belonging. Today many Bajo people in Bokori make a living operating shuttle boats to take the hordes of Kendari day-trippers to the beach. Others still live mostly from the sea and its bounty, including Mama and Bapak Fikram.

After we arrive, we sit for a chat and have coffee while Mama Fikram tells us the history of this place, how before everyone moved here, to the land, and still lived on the island, the kids had to paddle a canoe to school every day on the mainland, and would sometimes swim all the way home—about a kilometer across deep water.

But we're here to learn about the serong, her family's serong. Mama Fikram tells us that the serong was inherited from *her* family—not her husbands, she emphasizes. Her father had built it in the 1970s after noticing that spot always had lots of fish, especially the much-prized *cakalang*, or skipjack tuna. It was her mother's dying wish that her children take over the serong and that they guard it together and never allow anyone else to take it.

More than tuna, the serong captures whatever the sea wants to give them: ruma-ruma, of course, plus schools of all manner of fish, not to mention sharks and rays, including giant manta rays. They eat every kind of ray here, and each has its own particular flavor. Some are sour, some are sweet, some are musky. The really big ones, you have to just slice them in half right in the water—they're too big to get into the boat all at once. Most of them, you just boil for a second! Not too long! Just a little bit cooked, like an egg. That's her preferred method, though in other villages, they prefer it raw: chopped into little pieces and mixed with sago powder, left to soak and ferment for two to three days—and then they eat it. The smell is overwhelming, she says, but delicious—like the ocean.

We finish our coffee and join Bapak Fikram in his small boat and motor out to the serong. It was a beautiful, gray morning. The air was cool, and clouds lit up the sky, hugging the hips of the mountains in the distance. After crossing a deep channel, we reach what seems like endless reef. Indeed, Bokori is little more than a spit of sand in the ocean; the "dry" part of the island is only about 9 hectares, depending on how high the tides are. But the dry part sits on a vast complex of about 1000 hectares of shallow coral reefs. To the state, this massive reef is the Ocean—and only the government can own the ocean. But to the Bajo, this reef complex is just part of the island, part of Bokori, the way that fields and forests and gardens circling a town are part of the town. The rules of ownership and use are therefore the same as on land: if you use it, if you care for it, it's yours.

We soon reach the serong, located at the very edge of the reef complex's far side. It sits atop the crest of the reef—and just beyond the seascape slopes downward before dropping steeply into the depths of the Banda Sea. The serong is made up of vertical poles driven into the sand bed, with more poles crossing perpendicularly, lashed together. Below the perpendicular poles was strung netting: a fence, but one that fences off the ocean. The vertical poles were about 7 or 8 meters tall; 5 meters submerged, and 3 meters above the waterline; you can imagine the sturdy young trees needed for this construction.

There are many ways to design a serong. These ones are different from those by Nambowatu; this one is shaped like a nautilus shell—a gently curving spiral. It has a wide opening, 10m across or more. It was clearly designed for large fish; the gauges of the netting were about 10cm—enough room for small fish to escape. A gentle current was sweeping from the direction of the city, flowing into and through the mouth of the serong. As fish enter, carried up over the reef crest by the current, they swim toward the back. Hitting the back wall with its netting, they turn to the right, following the edge of the curving structure, which delivers them into a corral area adjacent to where they entered originally. Danial says this area is called the "bunuhan" or the "killing." From here you could easily gather the fish.

The time is coming to repair the serong again, completely, to replace many of the poles and to restring the netting. This is a rare, big deal event. It will take the help of many people. They rent a few boats with big diving compressors for this work. It is the kind of thing, he says, which requires preparation in advance. There is no rule for repairs. They fix things as they break, in theory, replacing broken poles and nets and such as they are able. While they prefer the good quality hardwood of the old days, today they make do with any old kind of wood they can get their hands on; the poles are usually only a few months old—not even one year old wood.[46] Replacing the poles requires a long, heavy crowbar of iron. They bring it down and use it to help ease and dig the poles into the reef below, pushing stones out of the way. Today the poles are strung with nylon netting that is purchased. But before there were nets, they used strips of bamboo, woven into a simple lattice pattern.

As we pulled up, we could see from afar a man perched on one of the horizontal beams, with a small boat tied up beneath him. As I soon learn, big serong like this are a joint venture between extended family members, who take turns "guarding" it continuously, all day every day. This is because they never know when the fish will enter the serong, when rejeki will swim their way, and they need to remain ready.

Figure 16: At home on the reef.

Usually, one person takes a turn perched on the serong, while the rest sit in a small, stilted hut a few hundred feet away. The hut is the most ramshackle, thrown together thing I've ever seen, and yet, here it is, strong, taking waves and wind, rock solid. It is perched on a series of wooden stilts in 7 meters of water, a floating day-shack. A plank floor in the middle, bamboo and wood making a sort of makeshift deck with wood lashed haphazardly to other wood. We scurry up wherever we can get a foothold. the sturdiness surprises me. The roof looks to be made of the leftovers from 50 different roofs. The floor is the same, as are the walls—composed of recycled bits and pieces, bricolage. It's a slow motion battle with disrepair; they replace one piece at a time, whenever they come across some scrap on the side of the road, or which drifts over as flotsam from the city.

Inside the hut three men sit, all old, all smoking, playing cards, playfully and theatrically tossing their best cards into a growing pile, while ashing their cigarettes through the floorboards into the emerald water below. There is a little place in the corner

to make a fire, a 5-gallon jug of drinking water, and a bit of rice. They stay out here from dawn until nightfall, most of them, just hanging out and playing cards and guarding the serong, letting fortune come to them. My first impression is that it is as much about livelihood as it is about lifestyle, about sitting and playing cards with your friends all day out on the reef. They each have a little boat tied up outside.

There are seven serongs here (a lucky number) along the lip of this reef, tracing the crest, all owned by families from Bokori. The small number makes sense when you realize the kinship element involved; the guys sitting here are all part of one clan, connected by kinship. So while there are only seven serongs, they serve far more than seven households in the nuclear sense of the word. Each contributes time and labor, and each shares in the fortune. Not long after we arrive, one of them finishes the game of cards, eats some rice, and then hops in his boat, and goes over to the serong for his turn at the post. I cannot help but think about this way of making a living as the opposite of the shrimp factory. Here the pleasure of fortune is measured by the length of time that you wait for it to find you.

The oldest of the guys was here when they first installed the serong; he is "some kind of cousin," he tells me, laughing. I asked him when people started diving with compressors here. He tells me a story that matched what I later heard from Imran—about giant ships from Hong Kong that arrived in 1993 to gather grouper and lobster for luxury seafood vendors in China. The boats sought out Bajo workers because they were famous divers, which was true. Before that, divers just held their breath—including for strenuous work like driving heavy beams into the sand to build a serong. An ordinary Bajo diver could easily go to 20 or 30 meters; skilled divers much deeper. But these days nobody can do that anymore, he said; once you get used to the compressor, it's hard to go back.

I ask the men about their travels, and this really gets them going. All of them had travelled extensively, fishing and trading as they went. They would sail all over Eastern Indonesia, to Australia, Papua New Guinea, everywhere. Kupang—some 500 miles across

open ocean—was “just nearby” they laughed. When they worked for the Hong Kong Ships, they would go to Labuan Bajo, in Flores, to find giant Napoleon wrasse 8 feet long and 400 pounds. They each started shouting back and forth the farthest places they had gone. The guy next to me said that from Papua to Kalimantan, the only island in Indonesia he hasn't visited is Sumatra—but the rest, “eeeeehhhh already been there.”

Part of the pleasure and ease of Bajo travel is that everywhere they go they find other Bajo people; people who speak their language and understand them. To illustrate, they told the story of a cousin who was travelling on one of the Hong Kong Ships, which had crossed the border into the Philippines, and finally arrived in Sulu. The rebellious Sulu archipelago, long at the periphery of Philippine state power, has been known as a center of piracy for centuries—including into the 1990s. So it wasn’t surprising to find speedboats pulling up alongside the Hong Kong ship, with armed men trying to board, yelling to each other in an incomprehensible tongue: pirates. That's when a Bajo guy from Bokori heard them speaking… Bajo! He couldn't believe it—even here, in the Philippines. He went out to talk with them. A few words were different, but they had no trouble understanding each other. He welcomed them on board, where almost all the divers were Bajo. Instead of a raid, they made new friends, and even gave them a parting gift of grouper from the ship’s hold.

The message of that story was one of belonging, even when you’re far from home. Indeed, as they explained, on the reefs of the archipelago, Bajo people are always at home—because they create home for others. Indeed, the serong and its guardians made me rethink what I thought I knew about the play between property, ownership, and belonging. A serong is just some sticks in the middle of the sea, and yet it makes a place in strong, deep ways, across generations. Inherited through the family, cared for by a clan, and occupying a gap in official categorizations between sea and land, the serong shows another kind of “property.” And while you can chase your fortune across the farthest seas, the serong also offers another way—of waiting, of letting your fortune come to you.

Figures 17 and 18: Many reefs around Kendari are marked by structures like this tripod; this structure marks a spot known as a cuttlefish nesting site; fishermen will wait here to hunt them.

CHAPTER THREE
Braving Capital

The first time Imran visited Nambowatu, he felt sorry for the people—wondering how anyone could possibly make a livelihood there. He told me this story while we floated on his boat, *the Two Sons*, in the middle of the small bay around which the village curves. I could picture his surprise: although beautiful, Nambowatu is little more than a long row of houses squeezed between a steep rocky hillside and a small murky bay. On one side was a forest conservation area, and on the other, a marine protected area—not much to work with. "Now look at me," he said, pulling up his wetsuit while nearly choking on his own laughter, "now I live here too!"

Imran was what locals call "pendatang," or a "newcomer," born and raised on the nearby island of Wawonii. Having set off from home to find his luck when he was very young, traveling around Sulawesi and Eastern Indonesia as a working diver, Imran had ended up staying in Nambowatu much longer than he originally planned—eventually marrying, building a house, and starting a family, all paid for by coral. The locals weren't surprised: everyone says there's something in the water here—it's so sweet that whoever takes a drink can't ever forget this place, and they all end up coming back.

The truth is that almost everyone in Nambowatu was more or less a pendatang, having arrived to this place mostly during the 20th century to find their own fortune. In this way Imran's story is also the story of out-of-the-way Nambowatu. He had come here chasing a commodity for a global market—and once he got a taste, he stayed for good.

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This chapter examines the commercial cultures and livelihood strategies of Nambowatu and the broader Moramo Bay area. It explores how kinship and ethnicity matter for

economic culture. And it explores different strategies for building an economic life along a changing coast.

I look at Nambowatu's and other villages long, serial experiments with producing goods for national or international markets; seaweed, cashews, cloves, and more—what I have called "experiments in fortune." These commodities tell the story of the emergence of market-oriented livelihoods that replaced older subsistence strategies beginning around the 1980s. Importantly, these experiments were all aimed not at local markets, but at national or international ones.

Next, I explore a strategy for selling on local markets, what I call "everyday arbitrage." This strategy reveals the patchiness of resource availability and loss in the Anthropocene. Unlike experiments in fortune, this strategy relies primarily on local markets. Finally, I examine the predicament of accessing capital or credit as a technique of generating fortune—encapsulated by the dilemma of the "bravery" required to play with institutional debt. This is the idea of "braving capital." Braving capital is actually a story of intensification, signaling the gradual rise of methods that require greater outlays of capital, time, and labor, and which involve greater risk.

I conclude with some reflections on the language of "play" and "experimentation" in economic culture. Together, these stories help to capture something important about the commercial cultures that tie together the worlds of Moramo Bay and animate the world-crossing supply chains that originate from its waters. In the experimental play of these commercial ventures, we see new worlds of fortune made and unmade.

Kinship and Livelihood

Nambowatu is just one of about two dozen villages that form a dotted line beginning just south of Kendari, tracing the coast of Moramo Bay, and reaching around the tip of the Tanjung Peropa peninsula to the strait of Wawonii. The villages that make up this broader "world" of Moramo Bay are closely interconnected socially and economically, held together

by dense webs of kinship. I constantly got lost in the never-ending networks of relations that linked together virtually everyone. To take just the little neighborhood where I lived on the far edge of the village: there were 10 houses, but only two "families"—which both openly referred to each other as fictive kin—satu rumpun (one "clump", one family) or "keluarga angkat," (literally family you "pick up" along the way; like adopted family or foster family). I strongly suspect you could draw at least one line that connected every person in the village through affine or cognate kinship.

The same was true, to a slightly lesser degree, for the relationships between villages. Everyone had an in-law or a grandparent or a cousin in almost every one of the dozen or so villages that spanned the bay. During major holidays the bay was full of motorized boats crammed full of people in their finest dress, motoring across the water in all directions to visit friends and family in other villages. Likewise, when a wedding or other important family or religious event was announced, people would travel to the neighboring towns to attend, sometimes charting large boats to carry dozens of people to make travel more economical. Groups of young people would find out from friends and cousins that a party would be happening in a neighboring village, and would show up to party, even if they had no connection to the family—this itself was a vehicle for thickening the webs of relations among villages, as the young people make new friends, or perhaps meet romantic prospects.

These social and kinship ties were also commercial or livelihood ties—that is, most people worked with their family. Indeed, for perhaps the majority of folks in the Moramo Bay area, the Venn diagram of kinship, friendship, and business partnership is a near perfect circle. This redundancy means that when you renew your relationship by visiting your cousin in the next village for his kid's circumcision, you are also maintaining a bridge, which even if unused for years, might one day open up an opportunity for mutual fortune seeking (cf. Munn 1986; Yanagisako 2002).

Affinal kinship in particular is a specific kind of economic relation across South and Southeast Sulawesi, especially for Tolaki people, for whom bridewealth prices are famously high—thousands of dollars in cash and kind, sometimes tens of thousands (in 2018 the common figure I heard was 30 million), not including the actual wedding expenses. Many men who would like to get married cannot afford this up front, so they delay and pay it out over time—it becomes a form of debt. Imran said he had met lots of married men who already had grandchildren and still hadn't finished paying. This is dangerous, he explained, because even if you die, it is still owed to the bride's family, and even if her parents die, it is owed to her siblings or other family members—and you cannot be buried until the payment is completed, which threatens your soul's eternal rest. This need for large sums of cash for marriage helps to motivate men into new forms of economic creativity, and pushes them towards livelihoods, like coral collecting, that hold the promise of windfall profits.

But being married also opens new opportunities for one's economic life through the bonds created with new family—especially for outsiders like Imran without prior kinship ties in the area. This is exactly how the coral trade still works in the Moramo Bay: almost every single coral diver was related somehow. Imran, who helped bring the industry to the village but was from elsewhere, married the daughter of another diver, Bapak Eka, and became part of the family. Back then, his team were all members of his new family—mostly cousins or in-laws. Even unrelated crew members were roped into fictive kinship. One night as we drank pongasi, the newest crew members, Nasir, from an inland town near the district seat, became emotional, telling me that he felt like the crew members had become his family, his "in-laws." Nasir's parents had died when he was younger, and he had become a travelling sago salesman to make ends meet. He said that Imran had become like a father to him—supporting him, giving him work, teaching him diving, and even cigarettes from his own pocket. And they returned his protection with loyalty; when Imran was sick

with decompression sickness, they came every day to check on him, help Lidya, and to look after the *Two Sons*.

The teams of other coral companies were also mostly part of this same web of kinship, part of the same family. Plenty of times I had assumed that someone I met was just a friend or acquaintance, only to later learn of their specific slot in the family tree, however distant. This was driven home to me one day when I finally asked everyone to help me make a basic family tree so I could keep all the names and relations straight. After we covered the most important three generations, and curious about the connection between family and work, I started tossing out the names of every coral diver in the village I could think of to see if they were too related. "Hamzah?" I said. "Oh yeah, he's Lidya's first cousin on her mom's side!" "Jono?" "Sure! Jono is Hamzah's nephew by his older brother!" Abdul. "Yeah Abdul is Lidya's cousin too—but on her dad's side!"

"What about Fahad?" "Oh nope, not him," everyone said definitively, followed by a long, unsteady pause. Finally, someone quietly said, "Wait… Lidya, isn't Fahad's mom cousins with your mom?" "Oh yeah! Oho oho oho! ["Yes" in Tolaki] That's right he's family too!" Everyone burst out laughing.

In short, economic life is lived through webs of kinship. Kinship here builds webs of interconnection and conviviality—webs not limited to blood, but which are woven among chosen family as well, those you "pick-up" along the way. These webs are mutually supportive, and also build bridges that could become new opportunities—new chances to join together in search of fortune.

"We Only Think of Deliciousness"

I was frequently caught off guard by the matter-of-fact, even fatalistic, way that people spoke about how ethnic identity shaped economic life in Sulawesi. Early in my research, for instance, a highly successful upper-class Bugis patriarch from Makassar who had come to Kendari to search for investment opportunities explained to me that part of his secret was

that he was Bugis—and the Bugis, he said, are "hungry for land." Speculation, investment, and kinship-capitalism were his destiny.[47]

I frequently heard Tolaki people deliberately contrast themselves to this overly diligent position—often in half-jest. One day while eating a delicious meal of sour-mango curried fish with sago, Mama Eka asked if I had ever been to a Tolaki wedding? Rumor had begun to fly that sometime in the next month there would finally be a wedding in the village—a local Tolaki girl and a guy from the island of Binongko, one of the islands in the Tukang Besi chain (aka the "-bi" in "Wakatobi"). While excited to show me a Tolaki wedding, Mama Eka had her concerns about the match; Tolaki dowries are famously expensive, and Binongko people are famously stingy (indeed, the wedding never happened, for reasons I never learned). "Binongko people are so stingy! Oooh the stinginess. They never eat nice fish, only anchovies. They don't even give you biscuits or something warm to drink if you come to visit!" I asked her to explain. "It's because they are smart with money! They want to save every penny that comes to them, and only think about the future. But us Tolaki? We only think of deliciousness! (I: mikir enak saja, mikir makan enak). We prefer deliciousness (I: enaknya)—we'd rather eat well today and worry about tomorrow later."

At first, I wanted to defend her and the entire village from what I heard as a slight of ethnic essentialism; I had witnessed first-hand how plenty of Tolaki people were diligent with money, just as I was sure that not all Binongko people were "stingy." But that was missing the point. This was an expression of a life-philosophy that Mama Eka saw as bound up in her Tolaki identity: that it was important to actually enjoy your life—something Tolaki people were good at. It was a statement of pride rather than self-effacement.

This kind of broad-strokes language is common in Southeast Sulawesi—perhaps a way to discuss and digest the ways that the region's enormous ethnic and linguistic diversity shapes life, identity, labor, and even one's fortunes. Indeed, a popular joke about ethnic difference and regional history goes something like this: Long ago, when the Bugis

first came to Kendari, they made camp by the shore. Curious about these strangers, the Tolaki locals wandered down to the beach to watch them, and they saw the Bugis cast their nets into the ocean to gather dinner. Amazed, the Tolaki people exclaimed: "Wait, there are FISH in there??"

The lesson here is that Tolaki people are supposed to be skilled farmers, hunters, and forest-product foragers. They are famous for their knowledge of the plants and animals of the forest and the birds of the sky and their horticultural sophistication. These are upland people with upland knowledge; experience with the sea is not supposed to be their strength.

So, when I would tell people in Kendari about my research, and that I was working with divers and villages around Moramo Bay, they would often say "Oh they are all Bajo!" When I would try to explain that no, actually, none of them were Sama-Bajo—people found this very hard to understand. Tolaki people are *farmers*, they would patiently try to explain to me; Bajo people are fishermen and divers and live in houses on the water; your friends must be Bajo!

Indeed, even Tolaki fishers and divers would frequently lament to me their inadequate understanding of the sea as deriving from ethnic destiny. While personal experience could teach you a great deal, you would always be at a disadvantage compared to a Sama-Bajo person who had a much deeper and culturally bequeathed understanding of the sea and its spiritual and ecological terrain.[48]

All of this talk of big ethnic categories aside, nearly everyone I knew was unashamed of a mixed ethnic heritage. Lidya was as close as you get to "Real Tolaki," (I: Tolaki Asli), though both her parents also had mixed Bugis ancestry. She had married Imran, a man from Wawonii, while her siblings all married people of mixed backgrounds as well—Bugis, Bugis-Bajo, Butonese. One of Lidya's uncles, Bapak Eka's brother, had married

a Toraja woman who had converted to Islam. All spoke Tolaki, and all were folded into the family without question.

Yet many ethnic groups were often understood to fall on a relative scale of power and prestige, affording them certain kinds of privilege. One night after a long day at sea, a group of divers tried to explain it to me over a pitcher of pongasi. Bugis people, from a Tolaki perspective, carry more prestige or status with them (I: gengsinya lebih besar), just by virtue of their ethnicity. Udin gave an example. If a Tolaki person from the village goes to the city, especially a young, unmarried man—him, for instance, he admits sheepishly—he's too shy to go to the marketplace to even buy vegetables. His unrealized status as a man without a wife, combined with his Tolaki identity, was just too much. But Bugis people have more gengsi, and this gengsi gives them both the courage and the privilege not just to shop at the market, but to make big economic moves—moving abroad, taking out loans from the bank, investing in land, building fishponds, or buying up rice plantations—and building wealth, power, and prestige. But this also requires a kind of risk and sacrifice—abandoning one's home, family, and community forever—that many Tolaki people find unacceptable. They may not have riches or prestige, the divers tell me as we finish the pongasi, but at least they know how to enjoy life.

Experiments in Fortune

By the time I had arrived in Nambowatu for my research, the hamlet of Okasuotuono, just a few villages down, had become famous for being a village of old people—a badge that the residents wore proudly. The villagers had been early adopters of cloves, and had been blessed with such success that they had all been able to afford to send their children to university. Their kids had white collar jobs and lived in the city, and the hamlet had become something of a retirement community—ordinarily sleepy, but bustling on holidays when the children and grandchildren would come to visit. Perhaps it was the destiny of a village primarily composed of Binongko people, to whom Mama Eka had ascribed such strong

skills with money and saving. But the "old people of Okasuotuono," as they were called, were admired by their neighbors around Moramo Bay. This was the future promised by experimenting with fortune, by lucking out and finding the right commodity for a world market.

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The story that globalization tells about itself is that producing goods for a global market will make you wealthier and improve your life. It is a story of the seduction of the global and the concomitant promises of modernity—to create progress, to improve lives, and to bring fortune within your reach. Economic integration—the connecting of all people and all things to a central grid of markets—is supposed to make things better. But does it?

Until the 1980s, livelihoods in Nambowatu were subsistence oriented. But in the 1980s a combination of factors, especially government introduction of cash crops and the emergence of motorized boats suddenly gave villagers access to both products and far-flung markets on which to dispense them. This kicked off a long march of experiments with different kinds of products aimed not at subsistence or local markets, but at national or international ones.

Over the years villagers have engaged in all manner of short-lived, sporadic, or one-off business arrangements with outside market makers who had the patience to wait for limited supply to trickle in. A few men in the village climb into the mountains to collect swifts nests from the caves to sell to buyers in the city. Others have been enlisted to gather locally abundant shellfish for mother of pearl production. Provided the price is right, people in Nambowatu are always ready for these propositions, keenly aware that you never know what the next big thing will be. Today's small trial-run could generate an enduring commercial partnership with lucrative potential. For instance, nobody saw the coral trade coming—and today it sustains the village.

Tania Li (2014a) has explored many similar questions in her ethnography of smallholder production in the Central Sulawesi highlands, where cacao became a "boom crop," with a price so appealing that smallholders switched from a mixed planting of annual subsistence food and local-market oriented cash crops, and started filling their fields with permanent plantings of cacao trees in order to cash in.

Li has argued that especially in remote, less densely populated areas, many smallholders feel that their best chance of success is to produce a good for a global or at least national market, rather than trying to target a local market. The smaller the market, the greater the risk you could crash it with an oversupply—and the more fickle the demand. In a larger market, filled with national and international firms vying for your product (or even a guaranteed market provided by the state, as in US corn and Indonesian rice), you can count on demand and you are much less likely to suffer acute pricing crashes created by oversupply. Folks in Nambowatu are keenly aware of this: you have to time your work wisely to avoid creating "floods" of commodities in local markets which destroy the price. For example, if there is a "flood of fish" (I: banjir ikan) then everybody suffers because nobody can get a fair price. In this way a globally targeted commodity feels "safer," enjoying competitive pricing and greater stability of demand and therefore price.

But as Li points out, the benefits of this strategy can also quickly erode. Going "all in" on a lucrative cash crop is its own kind of risk—and when the cacao trees began to succumb to disease, many growers were stuck. Plus, even in good times, the surplus you worked hard to cultivate can be easily captured by increasing production costs, or by the usurious interest rates on the price of capital, or by upstream market makers, regulators, bosses, and the other figures that stand between the producer and the buyer, each taking their own sliver of the surplus value. The amount paid to the producer is often miles apart from the nominal "price" once everyone has taken their cut.

Still—what else are you to do, except be ready to jump ship when the party is over, and be vigilant for the next big opportunity that might finally be your ticket to security, fortune, and the good life? Indeed, I found that folks in Nambowatu and across the coastal hinterlands of Southeast Sulawesi knew the contours of these boom-and-bust cycles intimately; they had lived them many times over. Markets, products, livelihoods—these things all come and go. The only thing you can do is be ready—because one of these days you might just get lucky.

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I have thought of these attempts to plug into global commodity circuits as "experiments in fortune." These experiments work on the principle that anything has the *potential* to become a commodity, but only if the right market connections appear at just the right time. Indeed, all manner of things—the dirt beneath your feet, magical powers, corals, fish, and every other kind of reef creature, an abstract square of space in the ocean, your body, your time—all of these can become a commodity, but only in the right context, if the stars align, and if the right market connections appear.

Folks in Nambowatu recognized that anything could be a commodity, but that this only mattered if the right connections, the right relations, to buyers and markets, were in place. Emically this is often expressed by folks who would talk about whether this or that crop or animal or item "has a price," or "doesn't have a price" ("ada harga ngak?"). As in "oh we don't bother to harvest and sell the coffee in our orchard anymore—now there's no price!" (I: gak ada harga!) The disappearance of a good "harga" for smallholder robusta coffee is of course produced by shifts in global coffee production, including its vertical integration by firms like Starbucks, as well as shifts in taste that deem robusta to be low-class swill. But you never know! Maybe next year a fungus will kill all the arabica plants, and the price for robusta will come back. Being *ready* for the moment when those conditions are right—when a surprise object suddenly has a price—is the task at hand, and is part of

the secret to finding one's fortune. But don't forget that most experiments fail: you better also be ready to abandon ship, to jump to the next commodity if the bubble pops or things don't work out.

Many of these experiments take the form of a "rush" or a "boom" with important viral social elements, and in reaction to fluctuations in demand and price, where the speed of its unfolding is too fast to evaluate carefully: gold is discovered in Bombana, or someone gets a fat payday from selling seaweed. Quick! The price is high and the payout is big—no time to think, if you wait too long you might miss it! Time to invest! Drop everything! Rip out your vegetables and plant cash crops! Buy the mercury and diesel and sail to the gold fields! Hurry!

The spatial or geographic corollary of experiments in fortune is a familiar one—the frontier. Experimentation produces new frontiers, and the work of frontiering is to experiment with ways to exploit a place to get rich. In Indonesian this is expressed by the familiar verb *merantau*, in which a young person travels far from home to go find their luck. But of course more than just a place, the frontier is a relation (Rutherford 2003; Tsing 2005). And so while some of these experiments indeed require travel, others simply ask you to rethink the potential of the places you already know well—to create the frontier at home.

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My first and most important guide through Nambowatu's long history of experiments in fortune was Imran's father-in-law, Bapak Eka. At the time of my research Bapak Eka was in his late 50s. He was warm, funny, and curious, but also a respected community leader with a thrifty and entrepreneurial bent. His background was mixed Bugis-Tolaki, and he spoke both languages—and embraced the entrepreneurial spirit that many believed was innate in all Bugis people. Indeed, over his life he had been involved in just about every kind of livelihood activity that had come through the village, and was always willing to try something new. He had been a rice farmer, orchard keeper, commercial diver, construction

worker, fish farmer, gold miner, ship-builder, anchovy fishermen, seaweed farmer, and petty trader—and those were just the things he did for money, not counting his various forms of subsistence fishing and farming, or skill as a boat mechanic and general handyman. He had a thrifty eye; when the neighbors got government help to upgrade their roof from thatched nipa palm tiles to one of powder coated zinc, Bapak Eka gathered up the least-rotted tiles and used them to fix up the roof of the family's little outdoor shed.

In the evenings, after sunset, we would often sit together by the water in front of his house, listening to the gentle pat of the waves and the evening duets of the Sulawesi Scops Owls echoing from the hills. He would ask me questions about my life in the United States, and I would ask him about his life here, to hear about his adventures and experience gained in all his experiments with fortune. The story began, he said, in the 1980s, when he was a young man.

Prior to the 1980s most households were focused on a combination of subsistence agriculture and fishing—also for subsistence, but with some fish left over to sell, especially as dried fish. But starting around 1980, things began to change as people started to try their luck at market-oriented production. The arrival of boat motors was the primary catalyst underpinning this shift—especially the arrival of outboard motors and later other kinds of motors suitable for small boats. This shift heralded the end of sailing and paddling as the primary means of transportation, and meant rapidly increasing integration with the city. Everyone who was old enough to remember agreed that sailing was more comfortable—the boat didn't rock as much thanks to the lift of the sails, and there was none of the cacophonous racket produced by the cheap motors in most boats—but the unpredictability was not worth it. Travel was easy when the winds were in your favor, but if you had an emergency during the west monsoon, you were stuck. Today the crossing to Kendari takes about 2 -3 hours depending on the boat used; in the past with unfavorable winds you might

be on the water all day, or have to sail a circuitous route along the coast, tacking across the wind.

The arrival of motorboats changed things dramatically. People ripped out their rice fields and planted cashew trees. Suddenly blast fishing was a business model—before there was nothing you could do with the windfall, since you couldn't reliably store or transport the fish to market in the city, and local people didn't need to purchase fish they could get for free. With the boat motor new horizons of commodity production were opened.

But motors also created their own new needs for cash. In most cases boats had to be specially built to house the new motors, and the motors themselves were also major outlays of cash—plus the expense of purchasing fuel every time you wanted to travel back and forth. The same pattern was repeated when people decided to replace their wooden stilt houses with concrete ones; cement mix and other tools needed to be purchased with cash. The cycle looped back on itself. You started planting cash crops instead of subsistence crops in order to make some money—but then you had to buy your food, which took even more cash—and so on. It is a familiar story of how out of the way places become roped into a global cash-based market.

In what follows I trace the histories of just three of the many experiments in fortune that have been part of Nambowatu's commercial strategies. First, anchovies, then Cashews, and finally, Seaweed.

Anchovies

The first experiment in fortune was with anchovies—or more specifically, with *bagang*—lift-net fishing vessels that use bright lights to attract fish. Bapak Eka told me that back in the late 1970s and 80s, Nambowatu was so full of night fishing vessels that at the new moon it looked like there was a city floating in the small bay in front of the village. Nambowatu was full of anchovies—and so it was full of bagang.

Because market connections with the city were still rudimentary back then, anchovies were the perfect target because they could easily be salted, dried, and preserved. Part was kept for home consumption, and part was stashed as inventory for sale at market—sold whenever the opportunity presented itself. Salted anchovies were also light-weight, and therefore easy to transport. Better still, they are a staple food not just locally, but across Indonesia—and so there was always a national market to access.

Back then, aside from cultivating swiddens, fishing was the primary livelihood—especially bagang fishing. Almost everyone in the village was involved in fishing and preserving the anchovy harvests. There were maybe 20 bagangs in the village—a huge number for a small place—and each needed a crew of several men.

Bagang is a vernacular fishing technology that likely originated in South Sulawesi with Bugis and Makassarese fishermen. There are many forms, but all share the key ingredients of bright artificial lights to attract fish at night, especially during the new moon, and a lift net. The lights are left on for many hours in the darkness, to attract as many fish as possible to "play" in the shallow water beneath the light. Then after enough of them have been lured in, the nets are quickly lifted from beneath, trapping the fish. The practices incorporate elements of indigenous fish aggregation devices combined with artificial light sources; the first bagangs likely originated in the early 20th century in South Sulawesi with the introduction of acetylene gas lamps. Bagang traditionally target squid, shrimp, and anchovies—all very small creatures; therefore the nets on bagang tend to be very small-gauged, which leads to huge amounts of bycatch. Some of the bycatch is valuable or useful fish that can be eaten or sold; others are worthless and just tossed back, often with high mortality. It was so effective that the technology quickly spread across the archipelago, especially in the east.

A Bugis fisherman in North Sulawesi explained to me once that the original bagangs were stationary: you would build a wooden corral offshore, and operate the lights

and lift net from there. Then, someone realized that if you put the bagang on a floating raft, you could move it around to follow the fish. After that, countless iterations emerged, with bagang mounted on a single canoe, or on a double pontoon style boat. Because boat motors were not available until the 80s, the bagang in Nambowatu were all powered by small sails or by paddling; this limited their travel distance significantly, but it didn't matter back then because the anchovies seemed infinite. It was so easy that they would park the bagang, turn on the lights, and go home to sleep, coming back a few hours before dawn to collect the fish.

Today there are no bagang in Nambowatu—but you can see them shining out on dark nights far across the bay, in the deeper water and on the far shore. In Moramo Bay, the bagangs operate within their own kind of moral economy. At night, men from the villages around Moramo Bay will motor over to fish near the bagang; the lights are so attractive that even fishing in the general area all but guarantees a good catch. But in the event that it doesn't, it's no worry: because most of the bagang operators are outsiders, locals often just pull their boats up beside the rigs and demand fish—and the bagang fishermen can't easily refuse them—so they often distribute the bycatch. One morning I ran into one Imran's many in-laws having coffee very early in the morning. He had just come back from night-fishing at the bagang and explained that it was these three months between the monsoons, and then again in the spring for the other inter-monsoon, which are the "season" for bagangs. For the four days of the new moon, they were catching hundreds of crates full of fish, and there were nearly 100 perahu from neighboring villages there to fish alongside them. He had come back from the bagang with a feast for the family, and we ate it together later with sago and lemon.

I asked Bapak Eka what happened to the Nambowatu bagang—why did everyone stop? He told me that over time the anchovies simply stopped showing up in their small bay—and expenses of operating the bagang just wasn't worth it anymore. Whether the decline in anchovy catch was caused by overfishing or loss of habitat (or both) is hard to

say. Nambowatu used to be surrounded by mangroves, which had all but disappeared with the growth of the village—a pattern repeated all around Moramo Bay. Anchovies mostly feed on plankton, so changes to food webs in the bay could have altered food availability. Climate fluctuations may also have played a role (Chavez et al. 2003). Whatever the cause, the decline in anchovies has important knock-on effects, since anchovies are also a primary food source for many of the top-predator fish.

But what really put an end to bagang fishing was that the villagers sold their bagangs. Bapak Eka told me that a big tuna fishing company with a huge boat hired him and 8 of the other bagangs to sail with them to Kupang so they could use their boats to catch anchovies and other fish to be used as bait for the tuna. They took apart and loaded the bagangs on a giant boat and sailed that way to Kupang. At the end of the venture, the fishermen all sold their bagangs to the company rather than try to get them home again. They had made them themselves from cheap wood that they harvested themselves, so the investment wasn't high in terms of cash, only time and labor. In Bapak Eka's opinion it was a good payout, especially considering that there weren't many anchovies left in Nambowatu. Besides, that's exactly when everyone was just getting into planting cashew orchards—the next big commodity.

Today there are no bagang in Nambowatu—but Bapak Eka tells me that one of his relatives had recently started to build one down the way. "Who knows," he says smiling, "maybe they'll come back."

Cashews

While anchovies were always partly about subsistence, for most of the village, the first foray into purely market-oriented production was cashews. Cashews became widespread in Indonesia in the late 1970s. Beginning in 1959, the Department of Forestry at Gadja Mada University in Yogyakarta began experimenting with cashew trees for a nationwide "greening" program (Indonesia Today 1979). The tree grew so well in the arid corners of

central Java, that it became an important component of the second "Five year development plan" (PELITA II) that ran from 1974-1979, along with the mass movement of transmigrants to the so-called "outer islands," especially to the more arid islands of eastern Indonesia (Asih et al. 2019). Native to the cerrado savannah ecoregion of Brazil, cashews thrive in tropical latitudes in places with a pronounced dry season, which includes much of Eastern Indonesia. The trees were thought to prevent erosion, "green" the landscape in places where other trees were difficult to grow due to exposure, poor soil, and low moisture, and had the side-benefit of providing an additional source of income or food for local farmers.

The area of cashew production in Indonesia more than tripled between 1978 and 1988 (from 82,000Ha to 253,000 Ha) and then doubled again before the end of the 1990s; it peaked at about 577,000 in 2014, and has been slowly declining since then as the first generation of trees age out of production and are replaced by more lucrative crops (especially cacao). Nearly half of cashew production in Indonesia takes place in Southeast Sulawesi, and almost all is done by smallholders like the farmers in Nambowatu.

Cashews came to Nambowatu in 1982 with this wave of state enthusiasm, around the time that motorized boats were becoming common. Bapak Eka remembered the year because his daughter, Eka, had just been born. Cashews were appealing on a number of levels. First, they offered a reliable way to earn some cash. But better still, they are extremely easy to grow, needing no attention for most of the year until the harvest season, and even then the trees do most of the work. The fruit are self-harvesting, falling to the ground when ripe. All you have to do is wander around with a bucket and gather them up.

If you're used to eating cashews and have never seen them growing, the fruit look almost cartoonish: a large red or yellow fruit with a small cashew shaped appendage on the bottom where the nut is housed. But the fruit wasn't important, only the seed, the nut. The fruits are soft and watery, with thin skins; they do not travel well. Accordingly, they are

kept back and eaten, and when you can't eat any more, you give them away, and when you can't give them away anymore, you feed them to the goats and the chickens. Eating them is a minor production, a deeply pleasant event: sitting in the shade of the house on the cool concrete floor on a hot afternoon, everyone with their own small paring knife, silently peeling the skins, quartering the fruit, and dipping them in a tiny plate of sea salt before popping them into your mouth. There is a floral nuttiness that is impossible to describe; spicy, juicy, dripping wet, a bit astringent, but decadent. You have to eat them carefully though: the juice will oxidize, turning your fingers black and staining your clothes! The yellow ones are sweeter than the red, but both are good—and especially good to eat on a hot day when you are thirsty because they are so full of water.

One morning during the cashew harvest season we joined Bapak and Mama Eka in the cashew orchard. Their land is just a little up the coast. We ride in their little boat, and when we get there, we pull up on a long mudflat fringed by mangroves. We park the boat and hike up a short path to the hills of their orchard. The cashew trees tower above, dominating the landscape. If you prune them correctly when they are young, they develop a relatively straight trunk that forks out into wizened boughs whose shape evokes a gnarly old oak. During the peak harvest season in November the fruit comes thudding down like fat raindrops. The only job is to walk the orchard carefully and fill your buckets. The fruit is like a flag, brightly colored yellow or red and impossible to miss on the dry forest floor. Cashews do best planted on hot, dry slopes where other trees find it difficult to grow—this means that when the fruit drops it often rolls downwards, collecting in little piles. Some growers create little berms by raking brush and leaves into a long row in parallel lines on the hillside, a little catchment area for fruit.

Mama and Bapak Eka only do a little preparation of their garden. Once a year, a few weeks before the harvest begins, they clear away the worst of the brush to make it possible to walk through find the fruit. Others are more proactive—it's common for growers to burn

the brush and fallen leaves in their orchards, leaving bare earth, and making fruits easy to spot and gather, but also making a muddy mess if it rains. Preparation for the harvest happens in October and early November as the fruits are swelling and beginning to blush; by mid-November they have started to fall in earnest; there is a window of only a few weeks where growers will head to their plots every few days to gather the fallen fruit. It feels like a flood, mostly coming all at once.

Their trees are old—at the time of our visit they were about 36 years old, planted just after the idea first started circulating in Southeast Sulawesi in 1982. Mama Eka remembers the period precisely, because she couldn't go to the gardens to help plant the trees because she was nursing baby Eka. But after decades of good luck, the cashews of Nambowatu seemed to be on the decline, not in a spectacular bust or bang, but a whimper. Cashew trees aren't especially long lived, with an average lifespan of about 60 years. However, their fruit production declines even earlier, after about 25 years—which is the interval at which they are replaced in most commercial endeavors. On the day that I went with them, we gathered only about 20 liters of cashews; a few days prior they had gotten 30. But these figures pale in comparison to previous years where they could easily fill a big 100-liter sack every day. But this was also a rough year for cashews: the weather was increasingly sporadic, with significant rainfall during what should have been the "dry season." Bapak Eka explained to me that they had gotten unlucky during the most important time period—flowering. If you get really hot weather (as we had) followed by heavy rain (as we did) this can make the flowers fall off, meaning less fruit.

Bapak and Mama Eka were already thinking ahead to whatever would come next—and planning long term. And so, one afternoon earlier that year I had helped them sow dozens of clove trees—pushing the fat seeds into small plastic pots of moist soil. First you have to sift the soil with your hands and pull out the rocks. The dirt is springy and red and wet and clayish. It clumps to little clumps when gently rolled. Fill 80 bags, and then plant a

large clove seed in each. But first, you have to remove the inky purple soft covering which smells delicious and rich on your fingers, the smell of cloves. "OOOH *diiiiirty*!" Mama Eka laughs. Quick! Wash your hands before the ink dries so that they don't get stained purple-black! It will be one year until they are big enough to be transplanted into the orchard as saplings, and then several more years for a harvest. Patience. It's agreed that since I helped plant the seeds, in 5 or 6 years, when they "learn to fruit", [49] I will have to come back to help with the harvest. "Then we can use our clove money to come visit you in America!" Mama Eka exclaims, laughing, and they make me promise that I will put this scene in my "book."

The seedlings are kept in a caged off area next to the house and covered with an old fishing net to keep the goats and birds off—a tiny propagation house built from the refuse of old livelihoods. In a year or two they'll be ready to plant out in the orchard, and they'll grow in the shelter of the cashews until they're big enough to give a harvest. Then the old cashew trees will come out.

This seems to be the trend—to replace the aging cashew trees with cloves. Cloves like similar conditions to cashews, and they do well on the villages hot, dry hillsides. Cloves have a few advantages over cashews. First, they flower twice a year, where cashews only give one harvest. And while prices have fluctuated over time, in 2018 the clove trend was up, and the cashew trend was down. However, the big disadvantage of cloves was that the harvest was a lot more work—requiring long hours spent on a tall ladder plucking off the undeveloped blossoms. And while cashews are forgiving if you miss a few days of harvest, cloves must be constantly picked at just the right stage, before the developing flower buds begin to turn white. It can take three days to harvest a single mature tree. It was so much work that sometimes people had to pay a neighbor to help them with the harvest—adding wage labor expenses to the cost of production. But this was all part of the experiment.

Figure 19 (top): Mama and Bapak Eka's clove seedlings. | Figure 20 (bottom): Mama Eka in the mangroves near her cashew orchard.

Others have had a head start. At the peak of cashew season, I go for a walk in the hills behind Imran and Bapak Eka's houses. In these orchards I am always amazed at the scenes of life. All around me ripe cashew fruit fall, juicy, to the ground with a loud thud and sometimes a squirt before rolling away down the slope. The mix of smells—dry earth, red pungent fruit, warm nutty cashew flowers and clove blossoms, sour springy perfume of mango blossoms—attracts of host of native insects and birds of all colors. In the late afternoon, in the hours before sunset, the smells seem somehow more pungent as if I'm whiffing the release of all the pent-up vapors of the day. I walk and walk, ascending the gently sloping hills, crossing several property lines whose only markings are the different forms of care and maintenance preferred by different owners—some with low rows of swept leaves, others totally clean and clear, a few left untidied; some with fruit diligently collected, with crutches delicately maneuvered to hold up the heavy boughs, others where the grounds were littered with uncollected fruit.

But dotted amongst the towering cashew trees are clove saplings, interplanted at rough intervals in between, their waxy, fragrant leaves filling the afternoon air. To protect them from the grazing of the village goats, the trees have been netted off using the nets and lines that were left over from the village's experiment with seaweed cultivation nearly two decades earlier. Here the wasted investment of one commodity is upcycled into the next big thing.

Seaweed

Around the year 2000 seaweed arrived in Southeast Sulawesi. Actually, seaweed had long been part of Southeast Sulawesi foodways, so more precisely, the commercial drive to cultivate agar-agar arrived, with great fanfare and promise. Agar-agar has long been a darling of sustainable development because of its sustainability, use of marginal landscapes otherwise not in serious use, and low inputs (beyond the initial startup costs), not to mention its sometimes extraordinary yields and fast growth. Commercial seaweed

cultivation in Indonesia provides more than a third of world supply, relying primarily on two carrageenan[50] producing taxa of red algae, *Kappaphycus alvarezii* and *Eucheuma spp*. Despite their classification as red algae, both are just as commonly green as reddish brown, and are closely related—belonging to the same family, *Solieriaceae*. Their form is like gelatin bronchial tubes swelling then branching off. Like many algae, they are able to grow from tiny fragments—sometimes purposefully grown from "micro propagules"

Nambowatu eagerly experimented with the new livelihood. The beauty of seaweed cultivation was that it had almost no ongoing costs after the initial investment; the seaweed was regrown from cuttings, the same ropes were used in the cultivation apparatus, and there were no chemical inputs at all. However, the initial investment was significant, primarily for purchasing line and cord to braid together, and the initial investment of time was significant as well. Most people went 50/50 on a huge setup with 100x100m rope grids with smaller rope loops tied on where you would stick the propagules—an upfront cost of about 5 million rupiah and 1 million for the initial seed stock. But the initial investment seemed low compared to its profit potential. The seaweed grew very fast, and Nambowatu alone pulled in many tons of dried agar-agar every month. The drying only took about 3 days, and then you could sell it for 15,000 per kg—a tidy profit. I was told that in the very late 1990s, the entire bay was filled with seaweed beds; you could hardly steer your boat through the thick webbing which stretched clear to the other side.

Cultivation was done near the shore; close enough to access easily, but far enough away to ensure that water circulates freely through the patch. The apparatus for cultivation looks like a long clothesline framed at either end by a thick rope anchored into the sand or mud. Between the framing lines, long thin lines are strung like rows in a field. Each long line is held afloat with a series of foam blocks or air-filled water bottles, and fixed with a set of small loops spaced maybe 8 inches apart, and into these loops are fed little seaweed babies snuggly tucked against the line. The seaweed grows fast, with harvest sometimes

possible in just a few weeks. Here, the farmers just unhook and pull in the long lines, remove the swollen bundles, and replace them with smaller pieces to start the process over. The seaweed is usually then laid out to dry before being sold by the kilo to be turned into additives for food and cosmetic products.

Despite its status as a darling of sustainable development, perhaps you will recognize what I have just described as a monoculture. The problem, of course, is the old one of plantation monocultures: by growing huge fields of clones, you provide a perfect buffet for pathogens and predators. Indeed, when I asked people why they stopped growing seaweed, the answer was always: "Hooo! the *pests!*"

The first to come were the turtles. Southeast Sulawesi was long famed as a source of tortoiseshell because of its enormous populations of sea turtles. Indonesian waters are home to five species of turtles, of which the green and hawksbill are the most significant, the former for its tasty flesh and the latter for its prized shell. Both would love to help themselves to a dinner of thick, delicious seaweed, thank you very much. And help themselves they did—the feast was irresistible, and whole patches of seaweed were cleared out before anyone even noticed, especially if one of the ropes dipped too far below the waterline. Not to be outdone, one of the local entrepreneurs saw this as a business opportunity and used the seaweed as a kind of bait to lure in the highly prized turtles which he then captured and sold, whether for their shells or as the main course for a wedding or circumcision party. The shells would be sold to a craftsman who would make them into amulets for protection against black magic. Still, there seemed to always be more turtles, and over time, they became better at sneaking in and evading detection, having learned the importance of stealth through this encounter, and the raiding got worse.[51]

Disease wasn't far behind the turtles. It was maybe two years into production when it arrived—rapidly draining the color and life from whole fields of seaweed. "Ice-ice" disease is apparently caused by a suite of bacteria, including some of genus *Vibrio*, the same genus

of bacteria that causes cholera. It leads to rapid changes in color, bleaching the whole plant to a crystalline white and calcifying its tissue. It seems to be caused primarily by increasing sea surface temperatures, which in recent years have spiked frequently due to climate change. Seemingly overnight, the seaweed beds of Nambowatu were turned to stone.

The villagers had had enough. Everyone ripped out their apparatuses, and never spoke of it again. One night while drinking pongasi with a group of neighbors, I asked my friends to explain again what had happened with the seaweed, and was told that in truth the disease and turtles were not a coincidence. Everyone agree that someone in the village had fucked it up for everyone else by angering the guardian spirits who make their home in the sea near the village. Great propitiation is not required, but permission must be obtained, and care must be taken with what words you speak. Someone, and they will never know who, spoke incorrectly (I: "salah ngomong") in their presence, offending the spirits.

Part of the problem was that the villagers were inexperienced in dealing the spirits of the sea, which, as they put it, was the expertise of Sama-Bajo people, who knew the right ways to behave at sea. Indeed, part of the reason that seaweed cultivation was so popular, it was explained, is that it emulated terrestrial plant cultivation, a more culturally appropriate activity for Tolaki people. Tolaki people knew how to behave properly in the forest, field, and orchard; but at sea, they were still students. The price for the impropriety was plague after plague upon the seaweed. Nambowatu was cursed to watch from the sidelines while neighboring villages enjoyed the windfalls of this easy industrial commodity. It was just as well: the plagues eventually spread, finding their way to those places. But still—this was just one experiment. There would always be another.

Everyday Arbitrage

Among the most common livelihood strategies in Nambowatu and around the Kendari area was a practice that I call "everyday arbitrage," where people take advantage of the uneven availability of goods across the region to turn a quick buck. Tracking cases of everyday

arbitrage is a way to tell all kinds of stories about fortune, inequality, loss, scarcity, and opportunity. It helps make sense of certain patterns.

The idea for gathering these stories together began after I ran into a friend in Nambowatu. My friend Alvin, a cousin of Imran's wife and an erstwhile coral diver, had disappeared for many months following the close of the trade. When he reappeared in the village, I asked if he, like so many others, had gone to work in the mines or in the plantations? Sort of, he said, but not really. He was indeed up north by the mines, but not inside them. Instead, he was travelling around the small islands that dot the sea offshore, purchasing whatever small amounts of tripang [sea cucumber] that people had in order to aggregate them, and then resell them to Chinese bosses and elites working in the mines. This story can tell us a great deal about sea cucumbers and their population histories, as well as patterns of inequality.

This niche is only possible because of two historical factors. First, tripang have all but disappeared—and it takes a knowledgeable local to drum up enough supply to be worth selling. Second, it is only possible because of the presence of Chinese mining elites with tastes for expensive sea cucumbers, and whose inordinate wealth relative to the Indonesians around them is itself a product of arbitrage: Chinese consumers with Chinese levels of wealth conveniently located here in the province in a zone of exception (Ong 2006).

Alvin knew that selling to a local tripang buyer who would feed them into an export bound supply chain would have only paid him a pittance—not enough to make it worth the effort of travelling around to find the sea cucumber supply. But he was able to skip all the middlemen, tariffs, and taxes—supplying straight to the consumer at retail prices. And crucially, Alvin only had this privileged market knowledge because of his experience gained by having worked both as a diver collecting marine products *and* having worked as a wage

laborer in the mines—where he saw the lavish consumption of the Chinese mining bosses up close.

In this one story we can understand the vanishing of the sea cucumber, histories of nickel mining, and patterns of power and wealth derived from the ability to control access to those resources. Sea cucumbers used to be abundant here, and their abundance created both power and powerful forms of desire and demand. Their recent vanishing has only heightened their value, as elites are willing to pay hefty sums for the delicacy. Bapak Eka laughed as he explained this ironic puzzle: back in the 1970s, there was sea cucumber everywhere in Nambowatu—but it had such a low price that nobody bothered. Today the prices are through the roof, and eager buyers are everywhere, but now there is no sea cucumber left to collect.

Everyday arbitrage, then, is about the patchiness of loss and scarcity, the uneven ways that loss and destruction are rolled out across a landscape. It is also a story of intensification: 20 years ago you could fill the hull of a canoe with sea cucumber in one evening of diving; today it takes days of travelling between distant islands just to muster a meager supply. But it is also about desires born of inequality and uneven wealth.

Once I started paying attention, I saw this form of arbitrage everywhere. I met an enterprising Bajo student studying history who ran a vegetable arbitrage business with his mother that coincided with his travels back and forth to the city for university. His home was on a small sandy island without any soil in which to grow vegetables. When he made the long 7-hour boat ride home, he would bring with him a boatload of fresh vegetables from Kendari's central market. Carrots and tomatoes are cheap in Kendari, but a rare luxury on the island, and combined with scholarships, the produce helped pay for his tuition.

I even participated without realizing it. One day Bapak and Mama Eka disappeared, returning in the evening with a load of long poles of pin-straight red mangrove wood (*Rhizophora mangle*) they had cut in a swamp down the bay. This is how I learned that

mangroves make especially excellent firewood—"this wood is like gasoline!" Bapak Eka told me proudly. You don't even need to cure them; they're dry within a day or two. The poles were sawed into short lengths, and then the whole family set to work beating the poles with a wooden mallet or small log to loosen the bark before peeling it back, the tannins staining your hands a bright ochre red. This is the kind of communal work that occupies the whole family's hands while they chat and tell stories, and despite the hard work this was one of my favorite research memories. Bored neighbors wandered over to sit and talk, and then perhaps without even realizing, they start to help beat the bark. Even random passersby on the path would stop for a few minutes, beat a few logs, and then continue on their way to whatever they were supposed to be doing in the first place. By the end of the day, we had finished all the logs, which were then quartered and tied into bundles. The next day Bapak Eka would put them back in his boat and travel to Saponda, a small Bajo island without any natural sources of fuel other than coconut husks—and sell them-5000 rupiah for a bundle of 25. The cash was put toward the expansion of Bapak and Mama Eka's house; they had added a make-shift wing from found materials for their daughter Mitha to live in with her son and new baby. The mangrove wood money would pay for bags of cement mix so that they could replace the plywood walls with concrete blocks. And since Nambowatu had very little good quality sand to use for building, some of the money might go to pay for bags of sand flowing in the opposite direction. Here everyday arbitrage was a strategy of generating cash. Natural stands of mangroves, some time, and the labor contributions of the community helped drum up a commodity—and uneven access to that commodity helped create its value.

At its simplest definition, arbitrage is the practice of buying cheap in one market, and then selling high in another, taking advantage of unequal prices for the same goods. Classically, this involves travel—the transport of gluts of material goods to places where they are rare.[52] This economic strategy is as old as commerce itself. Indeed, the entire initial

premise for European interest Asia was to circumvent the arbitrage of Indian-Arab-Italian supply chains by directly accessing abundant and cheap spices in Asia and transporting them to Europe to be sold at immense profit. In the later years of the Dutch and English East India Companies, commercial empires were strung together by complex arbitrage supply chains: Tea was expensive in England, but cheap in China—but to get the tea the English needed sea cucumbers, turtle shell, and sharks fin, which were abundant in Indonesia, but expensive in China—but to get the marine goods, they needed Indian cotton textiles, highly valued in Eastern Indonesia—but to get the textiles from Indian weavers, they needed silver from the mines in the Americas; here the arbitrage ends, the distal end of the chain propped up by violence and slavery (see Galleano 1973; Reid 1993).

Southeast Sulawesi has a long history in these webs; the region was a major source of the marine products that propped up many such arbitrage networks for many different players. Likewise, traders from Southeast Sulawesi themselves have long been players in intra-island arbitrage. The figure of the "lambo" ship is another good example.

Lambo is a style of wooden sailing ship whose construction combines indigenous and European elements. While other ships are focused on direct transport from point A – to Point B, lambo are used as a sort of circular arbitrage market that travels first east, and then back home west, carried by the winds of the monsoons. Today they load up with the kind of household goods that are easy to access in the city, but expensive in remote villages—kitchen tools, pots and pans, furniture, and other household goods, and then they sail in a circular route, hopping from port to port. As they sell, they also buy—whatever products may be abundant and cheap at the time, and then they are able to dispense with them at city marketplaces for a profit. This saves the locals from needing to organize and fund transport of their goods to a market destination, though it also usually means a lower price. A lambo voyage may last many months, before returning home. Lambo traders are the kinds of market-makers that generate the flows of goods across Eastern Indonesia.

While doing dive training in Baubau, I frequently drove past an enormous mansion situated near the beaches south of town; my friends explained that the house belonged to a "pirate," who made his fortune smuggling bales of second-hand clothes from Singapore (some say he got them for free, as trash), and selling them at local markets in Buton. One hot afternoon my friend Muis met us for lunch wearing a full-length faux fur coat under the noon-day sun. He spun around, grinning. "Don't I look handsome? It was so cheap!" Here, in a city where unconventional clothing options are rare, arbitrage provided the raw material for experimenting with new forms of self-expression, style, and taste. Indeed, Muis reminds us that at the other end of the transaction, arbitrage is not always about necessities like vegetables and firewood, but often powered by desires that are themselves playfully made and negotiated.

I was inspired to think about arbitrage by anthropologist Nidhi Mahajan in her ethnographic work on the dhow economies of the Indian Ocean world. Dhows carry goods between India, East Africa, the Arabian Sea, and the Persian Gulf. Dhow arbitrage is made possible not only because of price differences or unequal distributions of goods among different markets, but also by the unequal force of law and differences in legal regimes that make something cheap in one place, and highly valuable and highly risky in another. Mahajan shows us that the unevenness required for arbitrage can emerge—or indeed be constructed—in many diverse ways.

Indeed, as Jane Guyer argues (2004), even time can be terrain of arbitrage, where the trading strategy may be to exploit price differences between the market of today and the market of tomorrow, showing what Miyazaki (2013) identifies as the "slippery distinction" between arbitrage on the one hand, and speculation on the other. Indeed, for me the key distinction in everyday arbitrage is that it is a strategy that is decidedly *regional*. Everyday arbitrage relies on knowledge of actually-existing unevenness in resource availability and price, the kind of knowledge that is accessible only to well-connected

locals—such as that Saponda always needs firewood, and what people might be willing to pay for it. This geographic limitation allows people to operate with a near certainty of profit, minimizing risk. It is this circumscribed local regionality and the knowledge it affords that separates everyday arbitrage from blind speculation.

Miyazaki argues that arbitrage is not so much a single practice as it is a form of cultural sensibility, a way of thinking shared across the world of finance, and which shapes the landscapes of financial capital today. This is a helpful distinction that helps me see everyday arbitrage as part of a of commercial "common sense" shared across Southeast Sulawesi, where people are highly attuned to even small shifts in price and fluctuations in local markets that can either create new opportunities or destroy them. This is indexed in the discourse of "price," discussed above, with its paragon question: "does it have a price?"

Braving Capital

A university colleague of mine told me he had a student who had won a campus wide contest which solicited proposals for entrepreneurial projects. Winning proposals were awarded startup funds to test or develop proof of concept, and then if the experimental setup was successful, the campus would become a partner and then help the student turn their idea into a business, offering capital, technical resources, and the legal-political connections that come with university status. If the experiment failed, no harm no foul, you just needed to write a report explaining why. My friend invited me along to go check out the project—an experiment in lobster aquaculture.

Lobster had been a subject of intense debate and interest in the years leading up to and following my fieldwork. Indonesia is home to many species of lobster, two of which are of central commercial importance: the pearl lobster (*Panulirus ornatus*) and bamboo lobster (*Panulirus versicolor*). Both are extremely valuable in terms of price. In the early 2000s, lobster aquaculture took off in Vietnam and China. Indonesia began supplying them with lobster larvae (called "bibit lobster," or often just "baby lobster") to the tune of tens of

millions of larvae and hundreds of billions of rupiah each year. Fishermen across Indonesia would use specially designed nets fixed with special ruffles that attract the baby lobsters looking for a hiding place—dropping nets in the water at sunset, and hauling in thousands or tens of thousands of larvae before dawn. Chinese and Vietnamese aquaculturists would then raise these larvae for sale on the market, selling them for exponentially greater prices.

But lobster larvae was difficult to regulate and monitor, and overharvesting of the larvae seemed to be driving an imminent population collapse. Susi Pudjiastuti, the Minister of Fisheries during Jokowi's first term, had outlawed the export of lobster larvae in 2015. Predictably, this generated a lucrative black market for the lobster babies, which continued to be bought and traded around the country. However the policy fit a key part of Jokowi's economic plan—a policy continuation from his predecessor SBY—to contest Indonesia's place in the world system as the supplier of cheap raw materials, and to force the onshoring of value-added industry for different supply chains. Just as they tried to force the smelting of nickel in Sulawesi (see chapter 8), why not also develop the lobster aquaculture industry here in Indonesia instead of shipping our value away to China? It was in this highly experimental and politically charged context that we made our way to visit the student.

We arrived early—and end up chatting with a man who also had "played" with lobster. Like others in the village and around the bay, he was a man of many trades. "I do all kinds of work!" he explained. Today he's a construction worker, building the path for the village and paid for by village funds—this kind of work was always good because the pay was generous, and it involved building amenities in the village that he himself would get to enjoy. When he's not working on village projects, he might help Armin go diving for fish or coral, or go fishing. Since it opened in 2016, he's also been working as a day laborer dock worker at the new industrial jetty built down the road, which is used by giant ships for mining ore, coal, and heavy equipment.

When we told him about the main reason for our visit—the student and his lobster contest—he told us that lobster cultivation was indeed a common "experiment" (I: percobaan) being tried by lots of people in Laikatahi. The basic method is more or less identical to other forms of mariculture: you have a pen made of nets that is staked to the seabed in a shallow area, and you put your fish or lobster inside it until they are big enough to sell. He has one family member still involved—but he himself had already given up. The reason is that although the price of lobster is very high, they also require a lot of work. You need to feed them regularly, which is difficult if the net pen is far from home. While it would be easier to have the pen located just offshore, a short paddle from your house, for the best results you really do need to put them farther out, because they need water that's a bit colder, a bit deeper, with good circulation: "It's all about circulation—so that the water gets changed, flushed." That means you need access to a reliable boat and money for diesel fuel.

They get the seed stock from the university (which as a state institution was exempt from the ban on lobster larvae collection) and then they wait: it takes well over a year to mature to saleable size. When it works, it really works. His in law got over 30 million rupiah from his most recent harvest of just over 20 adult lobsters. That's a lot of money, but it takes a lot of work, and because of the high mortality rate, it's very risky. "That's why each time you do the cultivation, you have to do a lot, because you have to wait a long time. You can't get bored. You have to be patient—care for them constantly, give them food every day." It was too much fuss and risk for him, however. A year and half is a very long time to patiently work for a payout and hope that nothing bad happens, even if the payout is pretty big. Too much could happen in a year—bad storms, disease, thieves—that could risk the money you invest in materials and time and food.

What did they feed the lobsters? I wondered. They feed them whatever they have available: fish, instant noodles, rice—but the best food is a kind of cone snail called "burungo," which you crush up and sprinkle in the water. These used to be abundant and

gathered freely in the mangroves of the village—but most of the mangroves have started to disappear as they have been filled in by reclamation, and as the new jetty has caused the village to accumulate more sediment. So instead, they get the food from the bagang which are now everywhere in town—meaning they now pay for what they used to get for free.

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Indeed, each time I visited Laikatahi during research, I was struck by the proliferation of the bagang ships. Laikatahi has 5 bagangs at the moment, and one more will be added soon, he tells us. These are not the small, cheap bagangs of Nambowatu's past. These are big. They target anchovies and sardines, as well as whatever other fish they can get. This is a big change for sleepy Laikatahi. The first bagang was built by a Bugis guy from Pangkep who settled here years ago. He motored his bagang around Moramo Bay and made a lot of money, inspiring others to copy him—especially the newly arrived Mandar settlers from the west coast of Sulawesi. In his words it was this "flood" of Mandar fishermen who were driving the local bagang boom.

"I've seen it here, in Kendari, constantly growing the number of fishermen. Now there are fishermen everywhere. Those white ships? The first time they came from West Sulawesi there were four of them. And they had a really good income from the catch here." He was referring to the Mandar style *kapal gae*, a unique ship design from West Sulawesi which are easily recognizable because they are always carefully painted brilliant white. After their success, the original four Mandar ships were soon joined by many others. Indeed, in 2018 there were dozens and dozens and dozens of these "white ships" lining the shore of the Kendari Bay. While locals referred to them as *kapal gae*, boats that used a purse-sein to catch huge schools of fish, many of them were actually tuna fishing vessels that used long-lines called "kedo-kedo." Mandar fishermen will often live at sea, away from home for most of a year, returning to West Sulawesi only at Lebaran; many of them therefore end up marrying and making a home in the places where they fish—such as Kendari, and Laikatahi.

Figure 21 (top): A bagang in Laikatahi | Figure 22 (bottom): A new bagang under construction, framing over a boat aquired with government aid.

He was tapping into a sentiment shared by many in the fishing communities around Kendari—that outsiders from other places were swooping in and messing up their livelihoods. For the Mandar fishermen, Kendari was a kind of new frontier, no matter that it had always been lived in and fished. According to local fishermen, this "flood" of Mandar fishermen and boats was also causing a "flood" of fish to be dumped on the market; their pursuit of fortune far from home was driving down fish prices for everyone.

"Just yesterday the bagangs were pulling hundreds of crates of fish from the bay. A single bagang got more than 40 crates full." After the regular buyers are saturated, they sell the excess to a company up the road at the big container port called PT Samudra, a place where overstock fish can be brought when no other buyers are willing to give a good price. The price is very low there but better than nothing.

But Bapak Arman was still resentful of the newcomers driving this change in the village. "They're not afraid to go into debt with the bank, you know? They're lucky, right? But none of them are from here. They're all Mandar, with those kapal gae. But they did well, so they build another one, and then another one, and then another one—and now there are hundreds of them. And now they marry into the villages, and build houses, and build bagang."

I later learned from another Laikatahi local that much of the money used to build these bagang came in the form of government aid from the fisheries ministry—meant to "develop" coastal villages with a large capital infusion. But like many forms of aid, it was unevenly distributed. It tended to go to those who could position themselves as village leaders, those who were brave and confident enough, with enough gengsi, to navigate the state bureaucracy; these men tended to be the wealthiest in town—those who needed the least help. In Laikatahi, this meant Mandar and Bugis outsiders, able to trade on their reputations as prudent businessmen, received all the grants.

> "But the Laikatahi locals? We don't have a source of luck [untung] like they do. Only the newcomers. Because they're brave, you know? Brave enough to get a loan from the bank. 100 million, 200 million—then they build a bagang, and profit. Because they will be trusted, believed (I: dipercaya) by the banks… not like us."

This is the dual problem of "braving capital": first, whether you are "berani" enough to try—to assume the risk that comes with owing a huge sum of money to an institution—and second, whether you will be seen as believable and trustable by the bank. It seems that being "believed" by the bank has to do with ethnic affiliation; Mandar and Bugis folks have stereotypical reputations for being successful capitalists who deploy the kinds of resource-intensive fishing methods that might generate a return on capital. To use the terms introduced earlier, they have a lot of "gengsi" or prestige just by virtue of their ethnicity. Tolaki people in Laikatahi don't have access to those stereotypes which may help in times of raising the money needed to get into the game.

But there is an important distinction to be made here. People are not afraid of capital or money. They are afraid of the power of an impersonal institution—of being indebted to someone or something who doesn't care about you. By expressing a hesitation to embrace bank loans, people are naming the inherent risk that comes with borrowing from a private bank that exists outside your social world. But it wasn't just bank loans. One time a Lambo from Bingongko docked at the jetty in Nambowatu, peddling housewares and their famous ironworks, especially parangs (a kind of machete), which you could buy on credit. "Too scary!" Lidya said, referring to being indebted to a foreign trader from an ethnic group with a reputation for collecting on their debts and charging high interest.

While bourgeois economics assumes that all capital involves "risk," people in the Moramo Bay recognize that not all forms of capital or loans are the same. Borrowing from an impersonal institution like a bank is risky, because the bank cannot and will not negotiate with you or cut you slack the way that a friend or family member would. The same is true for loans from outsiders, like the traders from Binongko. Both the Lambo and the

Bank are external to existing social and reciprocal relation by which productive resources—money, yes, but also equipment and labor—are pooled. This kind of everyday reciprocity was ubiquitous everywhere I went—it was how people pooled the money needed to pay for expensive medical procedures, or to cover tuition for their children, or to finance the purchase of a new engine for their boat. Lending at this scale is the opposite of risky. When you lend your neighbor some small amount of cash, or some vegetables, or some of your time to help build something, you are not worried about whether you will be paid back; instead you are concerned with the good relations you are building with your neighbor that will continue to benefit not just both of you, but the whole social network to which you belong. In their reading, taking on a big loan from the bank is like agreeing to fight a bull: brave, sure, but possibly stupid.

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We finally go to see my friend's student, Tommi, and his father, Pak Yusuf. They have a tiny house here on the coast near Kendari that they use when they are in town, but home is Uwe, a village on the Tanjung Peropa down the coast from Nambowatu.

It turns out that our timing was off: they hadn't yet begun their new university experiment with lobster—they were just gathering materials and resources. But to our surprise we learn that this also isn't their first lobster experiment, but instead a new iteration with some tweaks—the most significant of which was to try out this new location near their Kendari house, where the environmental conditions were very different than in Uwe. Here the water was murkier, calmer, and more nutrient rich due to its proximity to the mangroves and estuaries of the mainland. In Uwe, by contrast, the water is crystal clear, and therefore very nutrient poor; and because of its location facing the Banda Sea, the waters there were much more rough.

Their first experiment was a failure. They had eight holding pens, with 1000 lobster larvae, so about 125 per pen; they soon learned that this was too many. The problem was

that the overcrowded conditions led to the spread of a "white" disease (I: penyakit putih-putih) that killed most of the lobsters; they said when you cut the dead ones open the insides looked like coconut milk. But then another unexpected problem: cannibalism. When the lobsters would molt and shed their exoskeletons—an activity that left them soft and vulnerable, and therefore usually done in isolation—the other lobsters would eat them. So they had to manually separate the molting ones—another time consuming labor requirement.[53] "We managed to get the investment back, but we didn't come close to our target… so no profit." Tommi and Pak Yusuf's failed experiment highlights the many risks that come with this kind of experimentation.

However, many others had also been "playing" with lobster cultivation in Uwe. Before the ban on lobster larvae, they would source them from Bali—now they have to find alternative sources, and try not to ask too many questions; this is why being able to acquire them from the university was such a help. They also emphasized the waiting and patience required, as well as the possible reward. One of Tommi's uncles later told me that if you are patient enough to wait a year, "having lobster is having money in the bank," what he jokingly called "Bank Lobster."

This is another figuration of "braving capital," where the small-time enterprise of daring, underdog villagers is able to assume the mighty powers of a private bank. Yet instead of a fickle, impersonal institution that could potentially multiply your bad luck by destroying you, Bank Lobster was firmly controlled by the villagers themselves. The abstract power of a bank to both store value and cause it to grow and multiply is domesticated in the guise of "Bank Lobster."

Conclusion: The Language of Experimentation

A common theme of the livelihood strategies discussed in this chapter is the way they are talked about—within a language of experimentation. While in scientific circles the formal, modern sounding English loan word "eksperimen" is favored, the stories above were vernacular experiments, called "percobaan"— the noun form of the verb "coba," to try. As we have seen, in some cases these experiments were government programs or initiatives run through development organizations, state agencies, or local universities, which further emphasized their official or semi-official status as state sponsored experimentation or "trials." Such was the story for cashews, for instance. Some of the extended family members in another Moramo Bay village were part of a cooperative contracted by the provincial forestry office to grow 100,000 nutmeg tree seedlings, at 3,000 IDR a piece, sold when they had three true leaves, to be distributed later as aid to poor farmers. And in the case of the lobster cultivation, the involvement of university researchers—both faculty and ambitious students who often served as liaisons between their rural home communities and the universities—further amplified the sense of scientific importance.

Indeed, a key mission of regional universities like Halu Oleo, has been to encourage innovation in the utilization of local resources, knowledge, and skill for utilitarian livelihood ends. This was reflected in faculty research agendas—investigating the utilitarian services provided by mangroves, or monitoring populations of crabs in response to fishing pressure. One faculty member I knew from the fisheries department was working to develop ways of cultivating algae as a food source that could be used as a cheaper and more sustainable food stock for feeding aquacultured shrimp. In this way there is a palpable entrepreneurial culture that spans all sectors of society—of people looking for new ways to generate prosperity from the resources they have at hand.

However, another way of expressing these same ideas of experimentation is the language of play. People would often describe their trials with the word "main," or "play,"

as in "we play at coral collecting," or "we're toying with lobster cultivation." The language of experimental play is often used for projects which are more tentative, less guaranteed, more "out there"—often side hustles or trial runs. I'm reminded of one coral boss, who himself started as a lowly diver, who now has diversified "investments" around Indonesia; most recently he was "playing" with a fleet of banana boats—big banana shaped pontoons dragged through the water by a speedboat, ridden by thrill seeking tourists and day trippers. This language of play is important because it also captures the sense of thrill, fun, and pleasure involved in taking risks and reaping rewards. Perhaps it also softens the blow when things don't work out.

The language of play is also tied up in the way that people spoke about the general atmosphere of boom, hustle, and entrepreneurship that I found everywhere in Kendari. Everyone had a project—a business idea, a side hustle, a plan for how they would make some money and improve their life. Capital was flowing freely, buoyed by the massive influxes of wealth tied to the mining sector—the subject of the next chapter. Those who were "brave" could get loans from the bank, and build a ship, or a fish pond, or buy some land. Riches were imminent for those willing to take the risk.

This atmosphere is hard to describe, but is neatly summed up in a maxim that I heard over and over that referred to this commercial froth in terms of a game: it is happening with or without you, so you can either be a spectator—or you can play.

INTERLUDE

Stealing Livelihoods

In October 2018, I was invited to a circumcision party in Uwe—the village home to my friend's student, Tommi, with the lobster experiment. Uwe means "water" in the Butonese Wolio language, named for the freshwater spring nearby. Uwe is primarily comprised of Butonese and Muna people, mostly from Pulau Makassar, who came here beginning in the mid-late 1960s, at the end of the chaotic-post independence period. Tommi's uncle was one of the first. He came here in 1972. At that time, they didn't sell anything, except maybe some vegetables to people on Saponda who had no way to get bitter melon, squash, or cassava. And sometimes they would sell wood, like Bapak Eka. But that wasn't much, just some light everyday arbitrage to earn a bit of "cigarette money." Everything else was just subsistence production. They cut their own lumber to build their own houses, and made thatch roofs themselves. They grew cassava—the preferred Butonese staple starch—and caught fish for their food. That was until the cashew trees arrived as a government project, around 1982. In the early days, they didn't sell the cashews—they just ate them. But within a few years buyers appeared, and the trees became an important cash crop. Like Nambowatu, the whole village at this time of year, October, smells beautifully of the rich, nutty flowers.

However thanks to their proximity to the extensive fringing reefs that line the far side of the Tanjung Peropa, today the most important market oriented livelihoods in Uwe revolve around fish. Indeed the shallow reefs around Uwe were among the healthiest I saw in the Kendari area.

The prosperity gleaned from the sea was evidenced by the amazing number of motorized boats. Every house seemed to have at least one boat, perhaps two. The boats are almost all typical *bodi* style, but with very shallow drafts (so that you can easily pass over

shallow coral reefs), and they roll and pitch a lot. I can't imagine taking one of these across the Banda Sea, but they do it. The boats are outfitted with "kedo-kedo." They make a large reel from a coconut palm trunk, and wrap it with heavy duty fishing wire (looks like steel). They attach home-made lures made from thread.[54] They use the heavy wire so that it will sink effectively in the water column, and then they continuously motor the boat with the line trailing behind, and that's how they catch grouper. Most of the boats have a built-in fish holding pen which can be filled with water. They said that they NEVER use meat or real fish bait, only lures, for the grouper. They don't bite baited hooks. They travel all around eastern Indonesia—sailing straight across the open Banda Sea to Nusa Tenggara—in search of grouper.

The amazing thing is where they learned this technique from. Uwe is a small, tight-knit community, and they used to maintain aggressive control over the fishing grounds in front of their village. This is how they have managed to keep their own coral reefs intact, by chasing away bombers or trawlers.

One day some years ago, when the Mandar fishermen were first venturing into Kendari, one of the white Mandar boats showed up in Uwe, using a kedo-kedo rig. The villagers drove the boat out of their waters—and then stole the technology. Now they are the ones who travel around Eastern Indonesia, visiting the reefs in front of other people's villages, using their kedo-kedo to search for their fortune. It is a fabulous irony that captures many important aspects of the kind of coastal commercial culture of Southern Sulawesi. Once they got a taste of the kind of money that they could make with their methods, their attitude toward the Mandar boats softened, and over time a transactive relationship was worked out. Now the Mandar boats harbor on the beach in Uwe, and trade fish in exchange for the village's fresh drinking water.

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That evening was the main event of the circumcision party—which had technically been going on all day. The entire village was in attendance—it wasn't every day that you had a big party. The sound equipment and the band had been brought in all the way from Kolono, first by land, then by boat. The family paid about 3 million in all for the entertainment, not to mention the use of the generator to keep the sound going. While we were sitting on the edge of the party, Tommi told me that when he was younger they would cross the sea just to go dance—anywhere they knew someone who was having a party; Wawonii, Amolengo, Toli-toli. These parties give young people a chance and an excuse to meet, a reason to hop on a boat and spend the weekend away. What was unusual, he pointed out, was that this party was mostly only people from Uwe—very few visitors came this time.

The highlight of the night, and of every good party in Southeast Sulawesi, was the *tarian lulo*, the circle dance, where everyone holds hands and steps in time in a circle, moving back and forth in a hypnotic, entrancing rhythm as electric synth songs blast in the background. In between rounds of lulo comes the time to play all the latest hits—some which had their own choreography, others which were just for "freestyle." Tommi assured me eagerly not to worry, that it was time to "shake it however" (I: goyang sembarang) so I could do whatever I wanted—flail about crazily if I chose—with the implication that I had probably never danced before.

After a while, I joined a group of young men in a darkened house by the edge of the party that belonged to one of Tommi's cousins who was away at sea; they opened a side door, from where we could watch the dancing, and somebody appeared with a few bottles of arak, a locally made rice liquor. Someone else fetched a glass. We sat in a circle of five; the one who provided the arak began pouring and passing the glass, as we each took turns drinking from the same cup—the way all drinking was done in villages around Moramo Bay, and indeed much of Indonesia. As we watched the tarian lulo spin around and around, the cup too moved in a circle, passing from person to person. They asked me if we drank

like this in America; I said no, usually people prefer to have their own, individual drink. They pointed out that this method was more fair—everyone would get a chance to drink exactly the same amount, and nobody would be left out. They were, of course, correct.

As the cup travelled around the circle, the young men started to tell stories of their own travels. One of the young men was Tommi's cousin, and he talked about his older brother who right now was on a Taiwanese fishing boat that made it all the way to Chile. They noted how strange it was to see photos of him in thick coats and jackets, for the cold. The cousin, along with Tommi's older brother, had sailed all the way to Kupang from here—three days and three nights in one of these little boats, they said. In Kupang they use their kedo-kedo to look for ikan tengiri, or Spanish mackerel, and they sell their catch to a local "boss" there who pays them very high prices. His cousin made enough money on that trip to pay the bridewealth for his wedding, and got married soon after, at 20 years old. But on the way back, they got lost at sea, and spent an additional terrifying two days without food or water—a story that only enhances the masculine sense of adventure that in addition to fortune, is the other object of these voyages.

I asked Tommi if he had ever been so far away. He had been all around the province hunting for grouper, but never sailed across the open ocean, or worked on a foreign boat. But the others interjected their admiration for him, their respect for him as an anthropology student who studied fisheries. He was in university, which was its own kind of travel and adventure, its own kind of far-off place.

CHAPTER FOUR
Seeing Fortune on the Reef

Just imagine how your life might change if you found it—the balloon mushroom. This was today's topic of conversation aboard the *Two Sons*. The question was posed by Fahad, one of the boat's regular diving crew members. We were sitting around in the gray early morning light, sipping sweet coffee while the glassy water around us lulled and rippled gently in the breeze.

From the perspective of the divers, the mushroom balloon was little more than tantalizing rumor. These waters around Kendari were full of little *jamur* or "mushroom" corals (scientifically known as corallimorphs mostly belonging to genera *Ricordea*, *Rhodactis* or *Discosoma*), and they came in all manner of colors—deep blues, greens, reds, oranges and golds—often in stunning patterned variations combining multiple colors. But I hadn't met any divers who had ever seen a balloon mushroom, the *jamur balon*—a specimen just two or three inches across, with some kind of disorder or defect that caused its tiny globular tentacles to swell into inflated balloon-like shapes that glow iridescently when hit with the right wavelengths of light. They were known to the crew, and to me, only from high-saturation digital photos taken from hobby tanks somewhere in North America.

Balloon Mushrooms are far and away the most expensive corals in the world. In late 2015, one such coral sold in the United States for an eye-watering US $6,000. Then, the following year, rumor spread of another, even more colorful coral that sold for US $10,000. Word of the sale ripped through the coral collecting world—across the blogs, online forums, newsletters, and listservs, and by word of mouth from collectors to importers, to exporters, all the way to the divers of Kendari and Moramo Bay, and onto the creaky deck of the *Two Sons*.[55] Now in 2018, the rumors of prices were still sky high, and every diver in the region was on the lookout, just in case.

Today we were specifically looking for *jamur* corals after an order had been placed by the crew's boss, and Imran had piloted us to a spot where he knew there were many, towards the inner part of the bay of Moramo, closer to the estuary of the Laonti River. They were all but certain to find *jamur* corals here, and better yet, the divers knew that these mushroom corals never grow alone—they always grow in little carpet-like colonies created from the repeating processes of asexual division—so if you find one, you are likely to find many. If ever they were to find a balloon mushroom, perhaps this could be the spot. The possibility was tantalizing. You never know! Maybe today would be the day.

The crew went back and forth chatting about all the things they could do with $10,000—an utterly life-transforming sum of money, even if they found just one and had to split the proceeds among them. It could be turned into houses, elaborate weddings, travel abroad, college tuition, land, boats, reciprocity, and rest. That cash, that mushroom, could be turned into a kind of security or prosperity or leisure—a kind of fortune—that the crew had rarely known in their lives.

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This chapter explores the embodied work of diving for corals and fish in the aquarium trade and how divers construct and navigate knowledge of the reef in their pursuit of fortune. Doing so requires not only getting to know specific places and seascapes, but also attuning oneself to the multispecies worlds of the reef. Yet even this is not enough: you need to also come to see the reef as simultaneously composed a litany of others and a litany of overlapping and intersecting commodity categories: to recognize how the components of the reef may or may not be turned into fortune—which organisms "have a price," and which do not, to use the framework from the previous chapter. Divers come to know the reef through the mediation of commodity categories—and indeed they participate in the production of those very categories through their work as collectors.

Divers have elaborate mental maps of the labyrinthine reef complexes that dot the waters of Moramo Bay. These maps were multi-scaled. They knew the topographies of individual reefs and "sites," and they understood how these sites fit together into a regional map of coral reefs. Experienced divers could tell you where to find an abundance of a specific species—and within a specific reef, knew the niches preferred by their various target specimens. This kind of knowledge could sometimes travel beyond the sites they knew well to one's they had never been to before: if you know, for instance, that mushroom corals prefer certain conditions, then you might be able to seek them out in other sites with similar conditions. But the work also required you to keep an open mind, and an awareness of the limitations of your own knowledge—that you might find a valuable treasure in the most unexpected places, that the reef could surprise you at any moment. This was the element of holding space for rejeki, or fortune.

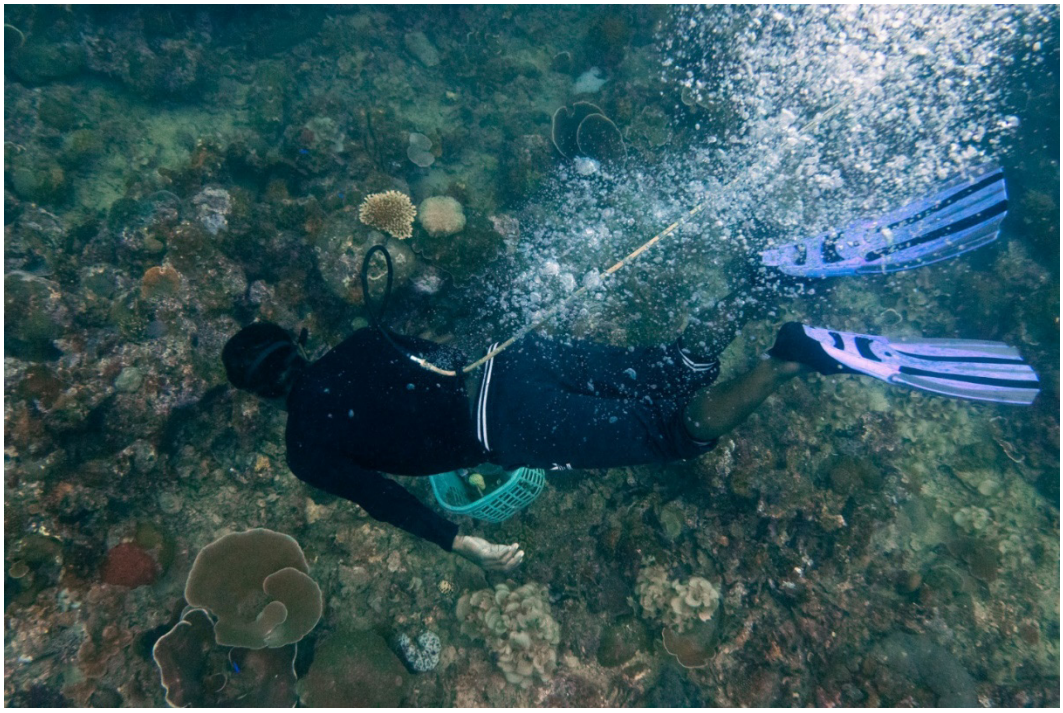
I understood this because I had similarly gotten to know specific reefs in the course of my dive training, and later by diving on the reefs around Nambowatu on days when I didn't go to sea with the divers. Over time I got to know a few different reefs the way that you come to know the stretch of woods through which a favorite trail passes. Each time you walk, you notice different animals or insects, or note how the plant life changes with the seasons as things migrate and bloom and fade away. So too it is with diving on the reef. Instead of trees, shrubs, and grasses you have corals and sponges; instead of birds you have fish flying by, and turtles instead of deer; instead of small lizards or rabbits hiding in the undergrowth, you look for frogfish or nudibranchs. Like terrestrial weather, currents and water clarity and waves change across the seasons.

This kind of diving made it possible—even thrilling—to dive the same spot over and over and over. It was the simultaneous feeling of visiting friends, with a sense of what you would see and where, as well as the awareness that something new and surprising could come at any moment. You gain the sense that reefs are not just places themselves, but

places made up of smaller places. If you find a frogfish, chances are it will stay in the same spot, at the same depth, for quite some time: it finds a little place that it likes, and settles in; you return day after day to say hello. The reef becomes a meeting ground.

In Nambowatu, for example, on my regular diving route I would always start on one side of a small peninsular reef-ridged—beginning by saying hello to the only giant clam left in these waters. It sat in a sunny, shallow spot, only about 5 meters below the surface, but hidden from above by a stand of *Acropora* coral on one side, and a boulder on the other—you could only see it if you dove down. To find it, I would swim to where the sandy slope covered in eel grass met a big patch of coral—like the sharp line where a forest meets a field. Turning right and swimming north along the line would bring me directly to the clam, which would contract its shell if I got too close, sensing my shadow with its hundreds of tiny eyes. It's thought that some giant clams can live to be over 100 years old and reach four feet in length; my clam friend was relatively small and young—maybe about 20 inches long. I hoped it would survive long enough to spawn and repopulate the reefs—but I guessed that eventually it would grow big enough that someone would notice it.

I usually reported the interesting things I saw while diving to my host family and got their help with identification by showing them pictures from my underwater camera. But I never told anyone about the giant clam, even though people asked frequently if I had seen any on my dives. Giant clams, which along with other related species are called "kima" in Indonesian and "o'kimo" in Tolaki, were both commercially valuable and treasured delicacies, known by the scientific name of their genus, *Tridacna*. The shallows were full of the smaller *Tridacna* clams, which were collected at low tide and enjoyed in many delicious dishes. But the giant ones had become rare—emptied out not for local use, but for sale in the city. Indeed, my secret friendship with the giant clam highlighted the central difference of my diving: while I was diving for curiosity and pleasure, Imran and the rest of the coral collectors were diving for the market—for fortune.



Figures 23 and 24: Diving for coral in Moramo Bay

The Work of Diving

Most dives are targeted to particular species, though divers will also collect anything valuable they see along the way. Coral divers are typically trying to fulfill bulk orders or maintain inventory of certain species and colorways. It is a balancing act between old favorites and novel varieties. But divers always hold out of hope for the serendipitous encounter with truly exceptional corals—one that could either create its own new bucket or category of commodity, or exceed the categories altogether, potentially commanding incredible prices. Find the right one, and all your troubles could be over.

This was how it was in April, 2018, in the weeks leading up to the coral closure. Things were finally moving—the permission to collect coral had appeared, illness was surmounted, the boat had been repaired, and a new compressor had been acquired. Even the weather had improved as the warm calmness of the inter-monsoon created ideal conditions for diving.

I remember the day in April that Imran first loaded his shiny new compressor aboard the *Two Sons*. The new Shark, its hunter-orange paint still gleaming and unchipped, seemed to put everything at ease in a way I hadn't yet experienced. Everything was less freaky than before; there was a palpable lightness in the air—everyone was in a good mood. We didn't know it at the time, but these few weeks would be the last period of easy coral diving for years to come, before the tables would be flipped by the impending coral closure. In the meantime, however, all of the pieces of the puzzle had clicked into place for a few weeks of blissful, easy, lucrative diving. The corals we would collect during these days were the same ones that we would take to Imran's boss in the scene that opened Chapter 1.

Such was the case on the morning of April 23rd, when we went diving at a small island at the edge of Moramo Bay. As with almost every diving day, we dropped anchor and then boiled a pot of water on the gas burner in the tiny makeshift kitchen to make sweet instant coffee. This ritual of coffee, cigarettes, and story time was a constant part of the

rhythm of life aboard the ship. It was nearly mid-day—too late for any activity other than diving; during the hottest hours of the early afternoon, those working construction, in the fields, or in the orchards all retreated to the shade. But this was the best time to dive, the intensity of the sun only helping to improve visibility.

After coffee, it's time to dive. Imran's new compressor required no laborious finagling—they simply pull the cord, and the engine graciously whirs to life. Today it is Imran and Fahad diving together. They each pull on their tattered wetsuits, grab an old plastic shopping basket, a chisel, and a hammer, stick the regulator in their mouths, and jump in. I grab my snorkel, fins, and my underwater camera and follow them down. The conditions were excellent; superbly calm, 10 to 20 m visibility, and as usual, no sign of current. The water was a warm 30 degrees Celsius (86F).

This is how it goes: They descend on the reef, kicking with finned feet. The depth depends on the site; today we are diving on a shallow reef-flat, about 15-20 meters (about 50-65 feet). At the bottom, the divers move along the reef quickly, scanning back and forth as they go. They look for anything that stands out against the ordinary, a glint of color in the murk. Many times I watched Imran closely as he passed carefully over a patch of reef that to me looked entirely uninteresting—only to see him carefully reach into a small crevice and extract a wonderous specimen.

When something catches their eye, the divers set down the baskets, and grab the hammer and chisel. Some corals grow in branching formations, like trees, and in those cases the divers expertly select branches with the right size and shape to become their own small colonies; a few sure taps of the hammer severs the arm from the parent colony. Into the basket. But many other corals grow in sheets, or leaves, or balls, or as an encrusting layer on a piece of substrate, or as replicating little mouths slowly creeping across a large boulder. These are more difficult to collect. In some cases you can follow the growth pattern back to the base; in others you have to chisel away a section of the substrate—mostly calcium

carbonate stone made up of the skeletons of other dead reef creatures—sort of like digging up a plant with its root ball. Later, on the boat, I watch as Donny uses a heavy blade to hack away the excess substrate and the concomitant life that has come along with it.

The divers move fast, and it's easy to lose them. Even when they are out of my line of sight, I can hear them at work: the "tink tink tink" of metal on metal, hammer on chisel, rings out an intervals, indicating that Something has been found. As they add more pieces to the basket, it gets heavier and heavier. To compensate they add small bits of air to two plastic bags tied onto the handles of the basket, like two little lift bags. They inflate the bags just enough that the basket glides along with them—like a little hot air balloon. When the dive is finished, they add more air to the bags—which gently lift the basket to the surface.[56]

One of the most distinctive features of this kind of diving work that was new to me was the long hoses that tether each diver to the boat. I learned quickly not to be in the way of the hoses, which coil and spread across the deck of the boat. One crew member always stays on board to monitor the hoses, pulling in excess slack in loose coils on deck, or carefully unwinding entangled hoses from divers who crossed each other's paths. If the divers are on the move, you might need to pull up anchor, start the cacophonous engine, and move the boat so that they don't exhaust the limits of their tether.

In the water I would use the hoses to locate the divers, following them like a guideline to the breathing diver below. I would hover over them from the surface, watching their bubbles rise to the surface, expanding in the decreasing pressure and multiplying to mushroom clouds of exhalation. The bubbles would break over my mask and face, like sticking your head in a vat of club soda. It is the same expansion of nitrogen bubbles trapped in bodily tissue that causes decompression sickness. Because the divers swim faster than their bubbles rise, it takes a while to get good at finding divers in the water; if they are deep enough, by the time you see their bubbles rising to the surface, they are likely no longer

there. Follow the trail of bubble clouds to find them, hoping they don't change directions too often.

At the surface, the baskets are emptied: a rainbow of a hall. First, there are the "bulk" specimens—corals which are tried and true favorites in the industry, and relatively common in these waters. These are collected in batches and sold in relatively high volume for low prices. Among these are karang nanas ("pineapple" corals) in various combinations of vibrant red and green—a common but popular choice. There are chocolate colored *Montipora* where the mouth of each polyp is fluorescent blue. I watched Fahad grab a bunch of beautiful *Physogyra* "Bubble coral" with deep blue ombre patterns. Many kinds of *Euphyllia*—a genus of stony corals which grow unusually large, bouncy, squishy looking polyps in a delightful plethora of different shapes and colors. There are gold and green *Caullastrea*, and striated colonies of *Pectinia*. And then there are the "jamur," corals—little polyps that come in the most bewildering colors (more properly called "corallimorphs," these are closely related organisms that look like small corals but do not produce calcium carbonate skeletons).

Then there are the lucky finds—the spectacular one-off specimens that occur more rarely and fetch higher prices. My mind is blown by a colony of *Blastomussa* with blue, red, and neon green color rings. There is a beautiful green *Symphyllia* brain coral. But the most amazing of the corals for me is a green *Acanthophyllia*—what is usually called a "donut" coral in Indonesian, though in English sometimes called "meat coral" for the way its texture resembles raw meat.

On board the boat, old styrofoam coolers serves as temporary holding tanks. The crew fill them with fresh seawater and begin to unload the baskets. The corals are gently placed in the coolers, evenly spaced in a single layer. A sheet of plastic is laid over the layer, before another layer is gingerly stacked on top. They continue this way until all the corals are unloaded. The boxes are placed out of the sun to keep them from overheating.

Figure 25 (top left): Jumping in | Figure 26 (top right): The leaky hoses | Figure 27 (bottom): A basket full of coral

Filling up the coolers usually requires two, sometimes three dives. Dives vary in length; today Imran and Fahad each did two dives. The first was from 9:24am to 10:46am (82 minutes). The second was from 12:15pm to 1:47pm (92 minutes). In between dives we would unpack the corals, get warm in the sun, and eat lunch. Imran would often carry a makeshift speargun with him during his dives to collect fish for us to eat and to take home later for dinner.

Because corals are living, breathing, eating, pooping animals, the water in the styrofoam boxes does not stay fresh for long. But the team will often dive for many days in a row—sometimes weeks. What do you do with the corals in the meantime? Each diving team has its own "stash" location—sometimes multiple of them. These are simply places in the ocean where you can safely leave your corals without having to worry about them dying in the stagnant water of the styrofoam boxes. Imran's team had a few such locations—the most important one was right in front of his house in Nambowatu—a place where he knew there would be no bombing, and where nobody would dare risk theft under the many watchful eyes of the neighborhood. The spot was a small depression in the reef flat with a bed of fine sand, about 12 meters below the surface. On most days we would pull into Nambowatu, and the compressor would be fired up again, the corals unloaded back into baskets, and then Imran and Fahad would descend, and carefully place the corals in their secret hiding spot.

These "stash" spots are an intermediary space, a kind of cache or storehouse of corals that serves an important function in the corals' journey to becoming "inventory." Corals could be stored there for days, weeks, or months; sometimes a coral would linger here as quasi-inventory for a long time before demand offered a pathway for it to become a commodity. There it would wait, as the diving boats crisscrossed overhead, until the markets finally called its name.

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Diving is undoubtedly a skill—and a skill that is attuned to specific target products. Coral diving is a particular skillset, as is diving for pearls or fish, or spearfishing. Each requires its own kind of attention and noticing, certain forms of comportment and ambulation through the water, and certain dexterity and facility with one's hands. A diver with experience working underwater can learn different forms of diving, but it takes time and patience and practice. It is a difficult skill to teach, because of the inability to communicate verbally in the moment; instead, the learning is primarily experiential and embodied, attained through trial and error and by trying to emulate those more experienced than you are.

Your senses do not respond the same way to stimuli underwater. Objects feel different to the touch; temperatures are more uniform, so subtle gradients in heat that we take for granted on land are not there, and the pressure sensors in your fingertips that give you rich tactile feedback are dulled as your hands go pruny. It is nearly impossible to determine the directionality of sound because of the way that acoustic conduction works underwater, and because sound travels much faster through water than air (see chapter 6 for more). Sound is paradoxically extremely clear (you can hear millions of individual clicks produced by organisms in reef ecosystems) and muffled. There is no smell (or rather, the smell is of whatever you are breathing—perhaps smoky, unfiltered compressor air).

Visually you find yourself in a world of illusions. Because water refracts light differently than air, objects tend to appear larger—as much as a third larger. Meanwhile objects appear much closer than they really are; you reach out to touch something that appears to be right in front of you only to fall short; by contrast objects which are far away tend to appear as if they are even farther—assuming that visibility is good enough to see more than a few meters beyond yourself. Indeed, water clarity varies radically, so that at times you are swimming through a dense fog, unable to see beyond a few feet; at other times, visibility can exceed 40 or even 50 meters in all directions. Both situations can be

dangerous—clear water can fool divers into going too deep, while cloudy conditions can cause you to become disoriented, lost, or to wander into trouble (Mallon Andrews 2016). Light is lost as you descend, taking color with it. The precise amounts depend on the clarity of the water and the brightness of the sun, but usually in clear conditions the color red disappears entirely at about 15 meters of depth, orange at 25m, and yellow at about 35m. Under most conditions, at just 10 meters over half of the visible light has been absorbed; at 30 meters, conditions are 80% darker than the surface, and even in the clearest waters, only about 1% of light makes it beyond 100m. Imagine wandering through the woods only by moonlight, where the greens and yellows and reds of daytime are replaced by shades of gray.

Then there is comportment. In most scuba diving situations, a skilled diver moves through the water parallel to the seafloor and surface, flying ala superman, legs trailing behind you. This is how most coral divers work as well. But different jobs require different forms of movement, and in Indonesia there is a long tradition where the most skilled divers are able to move around on the seafloor as if on dry land, vertically, appearing to walk or run, albeit in slow motion. This form of diving is associated largely with Bajo diving traditions, where feats of breath-hold diving are part of masculine bravado. Traditionally, only the most skilled spear fishers or tripang hunters are able to use these techniques, though they are also sometimes employed in coral mariculture. I've seen skilled divers running across the sea floor holding a large iron rack aloft over their heads.

In short, skilled diving is largely about bodily attunement to a radically different set of conditions from life on land—conditions that produce their own sensoria and physical parameters. It's a cliché to note that astronauts train for space by diving underwater, but the conditions truly are, as Celia Lowe (2006) has called them, extraterrestrial.

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In addition to learning oceanic conditions, divers also must learn to attune themselves to a panoply of others (cf. Kohn 2013). Indeed, it takes special kinds of embodied knowledge just to differentiate between different corals, let alone to know how to seek out a specific species. But in addition to knowing the reefs and the corals, divers are also thinking about the market. Not all coral is sellable—in fact, most of it is not. To be considered marketable, a coral needs to meet a very specific list of criteria. It must be small, but not too small. These days it should have at least three distinct colors—a source of contestation between some bosses and their divers—plenty of colors which ring out vividly in the filtered blue light underwater are invisible in the broader spectrum of light on the surface. If it is a branching coral, it should have, with very few exceptions, three roughly equally sized branches. The aesthetic idea at this stage of the trade is something akin to a good bonsai tree: it should resemble a fully grown specimen of its species in proportion, but at a fraction of the size.

In addition to shape, color is also vital. Unlike the highly saturated rainbows of color that you see on TV, most reefs are dominated by the muted pallet of tan, brown, gray, green, and some brownish red. This isn't surprising: many of the dominant pigments that give corals their color are the same ones found in terrestrial plants used for photosynthesis and other functions, including chlorophyll a (green), chlorophyll c (blue-green), peridinin (brown), and carotenoids like diadinoxanthin (yellowish), diatoxanthin (yellowish), and the more familiar β-carotene (red-orange). Most of the more brilliant colorations that makes a coral truly stand out—purples and blues and neon greens and yellows—are composed of other proteins, including light-re-emitting fluorescent ones. But these latter pigments are much more rare: it is their rarity that helps these corals command high prices.

One morning Imran grumbled that he didn't sleep well. Indeed, the night before I could hear him talking in his sleep from the other room, calling out numbers and muttering something about prices. He continued by saying that if you don't sleep well, you shouldn't dive—because it increases your risk of DCS, or "cramps." He was toying with the idea of not

diving that day; Donny, the deck hand on the *Two Sons* who hadn't yet learned to dive, quickly jumped at the chance to suggest that *he* could dive with Fahad instead. Imran shot this down—neither Donny nor Fahad was good enough to really tell the colors of the different corals apart yet. He pointed out that Fahad still struggled to tell the greens from the blues—a critical distinction that mattered when it came to price. Blue was rare and valuable, while in many cases green, even bluish green, was ordinary. Today they were supposed to find a very specific color combination—so there was no room for error: they were looking for *karang tangan* (I: "hand coral"), *Euphyllia glabrescens*, usually called "torch corals" among Anglophone aquarists. "The ones that PT. Cipta likes have green tips with a black base, or yellow tips with a blue base," Imran explained. Other combinations might not be saleable—a risk he didn't want to take. In the end, Imran dived himself.

Naming Coral

I couldn't help but become interested in the proliferation of systems for knowing and classifying corals. The categories used by the coral trade sit awkwardly in partial conjunction with scientific categories, indigenous and vernacular knowledge, and the categories used by the permitting and legal regimes that governed the trade. All were seemingly referring to the same thing—but pinning down forms of identification was a slippery subject, as we saw in chapter 1. I was fascinated by the gaps and overlaps between these different ways of knowing, and the back and forth play of constructing the categories.

Coral taxonomy is a rapidly changing field. Ostensibly authoritative categories are constantly being rearranged, split, fused, and recombined. Corals once thought to be totally unrelated turn out to be the same genus, while others thought to be closely related turn out to be the same in appearance only, produced by convergent evolution. Names are changed and revised on a regular basis as new scientific evidence is produced—especially molecular evidence produced by examining coral genetic material. Phenotypes, or the actual appearance of the coral itself, can be misleading. But science moves faster than law—so the

state often relies on categories that are no longer considered scientifically valid. This creates tensions within the regulatory system of CITES, which ostensibly creates a seamless, frictionless flow of knowledge and power between the "Scientific Authority" and the "Management Authority," in this case, between the Indonesian Institute of Science and the Forestry Ministry—not to mention the Fisheries Ministry which was also trying to insert itself in this process.

Then there are the vernacular names in use—all kinds of different partially articulating catalogs of names. Any given name for a coral may or may not correspond to a taxonomic category as outlined by coral taxonomy. There were names and categories commonly used by hobbyists in places like North America, and then there were names used by divers and industry people in Indonesia. Language entered as well: Indonesian and English mixed and jostled together, recombining in strange ways. Hence the corals that divers called "jamur balon," (I: literally "balloon mushroom") was usually called "bounce mushroom" in English in aquarium circles—and known scientifically as *Rhodactis*. But "mushroom" is also a common English name used to refer to corals of the family *Fungidae* (from the same Latin root as "fungi"), but which Indonesian collectors call "piring," meaning "plate" or "dish;" but "mushroom" is only really used to refer to Fungid corals in non-aquarium industry contexts—like in recreational diving—and aquarium hobbyists prefer "plate" in English: a tornado of names and categories.

Other vernacular categories didn't travel. For instance, the related species *Plerogyra sinuousa* and *Physogyra lichtensteini* are stony corals that both produce bubble-shaped polyps that float in little clouds above the skeletons. These are both usually called "bubble corals" in English. But in Indonesian they have different names: *Physogyra* is called "Mutiara" or "pearl," because of the way the bubbles resemble strings of pearls, while *Plerogyra* is called "karang kolang kaling cendol," in reference to a popular Indonesian desert made from the fruit of the Aren palm—which are smooth, pearlescent, and bouncy just like

the coral. This desert is unknown outside Southeast Asia—and so the name doesn't translate. Another coral—which also has showy tentacles shaped like a flower, goes by the related name "karang kolang kaling kembang," named because it appears like the other coral, but has the shape of a blossom instead—though scientifically, the two are unrelated. "Karang kolang kaling" therefore functions as a vernacular category, and "kembang" and "cendol" are modifiers of the umbrella type.[57]

Then there were names that appeared to be the same, but were not. The coral referred to by the Indonesian name "koral daging" or "meat coral" is usually *Lobophyllia*—the Latin name of which comes from its resemblance to a brain—hence in English it is often called "Brain coral." Meanwhile in English "meat coral" usually refers to *Acanthophyllia*, but sometimes also to *Cynarina*—both of which have a distinctly "meaty" appearance.

This confusion of names and categories matters greatly for the operation of the coral trade: it shapes how divers collect, how the trade is monitored and regulated, and how the apparatus of the inspection and permission system does its job. To take just one example: one of the most valuable and popular corals in the live coral trade was the genus *Scolymia*, often referred to as donut corals, including many of the famed "rainbow donuts." But in 2012, molecular evidence showed that this single genus actually contained *three* genera—and researchers found that they weren't even closely related to one another, being assigned instead to different families (Budd et al. 2012). That's the taxonomic equivalent of realizing that something you thought was a dog or a wolf is actually a cat—a big difference. The new taxonomy determined that true *Scolymia* are found only in the Atlantic Ocean, and that the Indo-Pacific corals formerly known as *Scolymia* would now be divided into two different genera: *Parascolymia* and *Homophyllia*.

But this change was recent—and it takes years for these kinds of taxonomic adjustments to be widely accepted by the scientific community, let alone incorporated into legal policy. Hence in 2018, the official permits and harvest quotas continued to refer to

Scolymia—as did the photographic ID guides issued to the fisheries quarantine inspectors. How many different, genetically unrelated species would pass under that heading? We can never know. If the world's leading coral taxonomists have trouble telling them apart with the most sophisticated laboratory equipment on the planet, then how would an underpaid fisheries inspector be expected to do so?

In some cases, proposed re-writes to the coral family tree which seemed based on strong science were eventually reversed—which made it hard to know when it was "safe" to adjust your categories. Sometimes names were proposed, but failed to stick, or were supplanted by new evidence just after they began to be adopted.

Meanwhile, keen coral observers in the aquarium hobby world watch on in confusion, trying to keep up with the taxonomic chaos. Online discussion boards and forums are full of threads with titles like "Australomussa / Parascolymia confusion" or "HELP ID - CYNARINA OR ACANTHOPHYLLIA??" Popular industry websites like "Reef Builders" periodically try to synthesize the changes for their readers, publishing what they called "nerdgasms," or long, technical posts diving into the details of the taxonomic re-writes. One such post in 2014 tried to summarize many of the recent changes—including some which undid prior changes—around the old genus Scolymia:

> … for *Scolymia*, the three Atlantic species retaining that name. The former "*Scolymia australis*" is now *Homophyllia australis*. The former "*Scolymia vitiensis*" is now *Parascolymia vitiensis*. And for good measure, it was determined that "*Indophyllia*" wasn't really different enough from *Cynarina* to warrant its own genus, so it is now *Cynarina macassarensis*. (This last change is something we as aquarists knew all along. Those two were always difficult to tell apart!).[58]

That parenthetical point seems worth emphasizing: sometimes the collective vernacular knowledge figured things out well before the scientists. Native categories often functioned just as well as scientific ones—sometimes better—and had the benefit of diachronic stability.

All this means that when divers go looking for coral, they do so with a list of names jostling around in their minds. They may have a specific order to fulfill: X number of "mushroom" corals, for instance. They may also have more explicit instructions: not just "mushroom" corals, but red ones; not just "karang tangan" but ones with purple tips on the tentacles. They need to find corals that can reasonably be said to fit within the category conjured up by that name, or something close.

However, there is also the literal list: the piece of paper that enumerates the quotas for corals assigned to their boss. Every single coral that is shipped must be officially slotted into one of these categories, counted against the tally of the quota. However, the goal of the divers, the dream, is to find specimens that not only fit the name, but also stretch the boundaries of what the name contains. They search for corals with phenotypic novelties: interesting shapes and colors and patterns that have never before been seen. I sometimes wondered whether species unknown to science had ever passed through the coral trade, awkwardly squeezed into a category to which it bore some resemblance—passed off as a unique variation on a theme.

The Hong Kong Ships

How did a diver like Imran come to know the reef—not just as seascapes, but as places populated by commodity categories? Indeed, Imran's life history reveals a lot about the recent history of Southeast Sulawesi reefs, and about the forces and projects that have worked to turn them into commodities.

Imran has a distinctive low raspy voice that went up several octaves when he laughed, which was often. He favored graphic tees, cargo shorts, and flat-billed baseball caps from American surf brands, though his favorite shirt was one with a reproduction of the iconic photo by Richard Copley of the 1968 Sanitation Workers Strike in Memphis, showing Black workers on the picket line, cops' bayonetted rifles in their faces, carrying signs with the slogan "I <u>AM</u> A MAN." He didn't know the full story of the shirt, but

understood enough to identify with a portrait of resilient rebellion and an assertion of one's dignity.

Imran is now about 40, and has been a professional diver for most of his life. Born to a farming family on the nearby volcanic island of Wawonii, he set off from home to find his luck when he was young, becoming a commercial diver when he was just 14 years old. His older sister had married a Bugis man who had spent time living on Saponda, a Sama-Bajo island between Wawonii and Kendari (there are old ties between Bugis market makers and Sama-Bajo marine product collectors). This is how he was first connected to what everyone called the "Hong Kong ships" that we heard about from the Bajo divers previously.[59] The ships were part of a seafood company plying the lucrative live fish trade, exporting live grouper and lobster for luxury seafood restaurants in East Asia, where patrons could watch the fish swim around in showy tanks before choosing one for their dinner. When they came to Indonesia in the early 1990s, the boats turned to local Sama-Bajo people because of their reputation as divers—which is how they came to Saponda. Although he wasn't himself Bajo, Imran's brother-in-law signed on to become a diver, and invited Imran to join him. There was the promise of fortune and adventure—so in 1996 when he was 14, Imran left school and joined the crew.

Imran lived on the boat while they were at sea, along with dozens of other divers. The company had 10 big boats in its fleet. Each big boat had 6 smaller "speed" boats used for diving, each with its own crew of five—so around 30 divers on each boat. While the main boat crew were Hong Kongers, all of the divers were Indonesian, almost all Sama-Bajo or Bugis, though Imran's team consisted of him and four other divers from Wawonii. At first Imran just worked as crew on the speed boats. But those who worked on the boats only made 100,000 per month—and Imran wanted more.

"I was so small!" he recalled. After two months, Imran finally learned to dive in the warm, shallow waters of Wakatobi. This was before the time of diving compressors, so the

divers used SCUBA gear. I asked him how he learned, recalling my own series of dive training classes. But the philosophy on the boat was that diving couldn't be taught—only learned first-hand. Eventually they put the gear on him and his brother-in-law "just tossed me in!"[60] He was a fast learner, and soon was diving every day.

Back then, his team could get 200 grouper in a single day of diving—an incredible number; I let out a shout of confused surprise when he told me. This was only possible because they used squirt bottles of cyanide, euphemistically called "obat" or "medicine" in Indonesian. Back then, in the 90s, there were huge grouper everywhere. The divers rarely had to go deeper than 5 meters for a good catch. Grouper never stopped swimming, Imran explained, so the trick was to get below them and squirt the poison on them as they swam past; you could get 5 at once that way. Some of the big ones were as much as 45kg (100lbs)—the size of a Bernese mountain dog. This was probably the giant grouper (*Epinephelus lanceolatus*), which are functionally extinct in shallow water. If the fish were hiding, they would find a coral bommie that looked promising, squirt in the poison, and then the fish would come stumbling out, "drunk," and could be easily scooped into nets. All the other little fish would just die.

Each ship had a massive seawater tank on board where the live fish would be held, swimming in endless circles. The crew would spend a month or two at sea collecting a big load, and then would travel back to Kendari. The divers would disembark, and the boats would continue on to Hong Kong to deliver the goods; the trip there and back took less than 1 month, during which time the divers would rest, before starting all over again.

When they weren't catching fish, they dove for lobster. Imran told me that diving near his home village on Wawonii, they would spend three nights diving and come back to the boat with 500 lobsters—they could get 300 on a really good night. There are two common species of lobster exploited in Indonesia: "pearl lobster" (*Panulirus ornatus*) and "bamboo lobster" (*Panulirus versicolor*). While both are valuable, pearl lobster is much more

expensive; today it is so rare that it sells for IDR 1.5-2 million per kg, an incredible price. They average 2-3 kilos when mature, so a single lobster can earn you IDR 3-6 million—significantly more than most people make in a month. Bamboo lobsters are expensive as well; the one time I saw Imran sell one on Saponda, a single medium sized individual netted him IDR 300,000.

Back in the 1990s, the price for grouper was expensive, but relatively cheap compared to today: IDR 25,000 per kilo; but that was before the monetary crisis that radically devalued the Rupiah; 25,000 in 1995 would be worth about IDR 200,000 / kg today. Today they are worth 300,000 per kilo or more. Now multiply these figures by 6 dive teams, and then again by 10 ships: on a normal day the company might be harvesting thousands of groupers worth billions of rupiah—revenue flows of US $1-2 million or more per *day* are not difficult to imagine.

Imran made a good living from his work—about IDR 300,000 a month at that time, about IDR 2.5 million in today's money (about $175), and the company paid for all his food and cigarettes, and he had free accommodation in a company dormitory while not diving. He was even kept on payroll even when not diving—paid a generous salary just to sit around and wait. He and the crew feasted on the grouper and fish that had died or weren't fit for export; Imran told me that he got "bored" of eating lobster every day and would crave chicken. Not bad for a teenager who didn't go to high school—even if the wages were of course a pittance compared to the profits made by his labor. But it wasn't just Imran: everyone in the coastal villages around the area knew the Hong Kong ships. They became like a rolling marketplace—villagers would collect lobster or grouper, and then wait for the ships to show up and sell them on board to make some extra cash. Everyone could get in on the frenzy—and you might as well, because the grouper were going to be gone either way.

The Hong Kong Ships were not limited to Kendari—they would go everywhere: Ternate, Taliabu, Manado, Ambon. Imran says they were all owned by PT Barito, one of the

largest companies in Indonesia that holds interest in energy, mining, and logistics. I can't find any direct evidence of this, but Barito is a massive holding company with dozens of subsidiary companies in which it is majority owner—so it is entirely possible. Today Barito is the 14th largest company on the Indonesian Stock Exchange with a market cap of over $6 Billion; it's subsidiary, Chandra Asri Petrochemical, is number 8, with a market cap of over $11 billion. The chairman and founder of the company, Prajogo Pangestu, has a personal net worth of $7.6 billion. Pangestu started his career doing inter-island shipping and logistics, and later joined Burhan Uray's Djajanti Group, before parlaying his connections into his own logging empire under the auspices of the New Order dictatorship. Under Pangestu, PT. Barito was responsible for much of the destruction of the rainforests of Kalimantan; it isn't hard to imagine that they would also have been involved in the defaunation of Eastern Indonesia's seas.[61]

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It was after those early years diving for grouper and lobster that Imran was recruited to a new kind of diving—for coral and fish. It was the early 2000s, and the live coral trade was just blossoming in Indonesia. Back then there weren't many divers other than the grouper and lobster divers—which is how Imran connected with the very first coral company that opened in Kendari—PT. Cipta Berkat Bahari, based in Bali. PT. Cipta sent an agent to Kendari to check it out—Pak Rajin. He was amazed at what he saw—huge supply and immense diversity of species and form. Eventually Pak Rajin would come to call Kendari home, and over time, PT. Cipta would assemble a fleet of diving boats and a small army of divers. Other companies soon followed, creating new competition.

Imran went to work for PT. Cipta, and trained up several divers from Nambowatu, who would eventually become his family. In those early years they were still getting to know the area around Kendari, and where they could look to find different kinds of coral and different ornamental fish. And Nambowatu turned out to have lots of a small fish that was

in high demand. They call it "bluester," one of the many Indonesianized Anglo names for ornamental fish; the identification guide books tell me that it is called Azure demoiselle: *Chrysiptera hemicyanea*. Back when ornamental fish and coral were just getting started in Kendari, Bluester was in high demand—and they found boatloads in a tiny village called Nambowatu. They didn't even need a compressor at first; you could get 5000 just by holding your breath. Alvin's dad would collect them using the little butterfly net.

Because of their high mortality and low price, Bluester were a fish that was needed in volume—which kept PT. Cipta coming back to Nambowatu. Soon, they were diving for coral in the reefs just beyond the village. They began recruiting divers from Nambowatu—including Imran' soon to be father-in-law, Bapak Eka. After a few years, Imran married his daughter Lidya, moved to the village, and built his own house. Cousins, uncles, in-laws, and nephews all took up diving—and soon it was a family business. Nambowatu became famous for its coral, and Imran became famous for helping it all get started.

Diving for Fish

Things had changed a lot since the days when you could make good money scooping up Bluester with a butterfly net 10 feet in front of your front door. The ornamental fish trade had blossomed, bringing demand for all manner of tiny fish previously ignored by divers and coastal communities.

Collecting coral is one thing—but diving for fish is a different skill entirely. When the coral trade closed, Imran was one of the few lucky ones skilled in collecting ornamental fish. Still, fish is hard money compared to coral—the diving is more difficult (the difference between prey that moves and prey that sits still), the risk is higher (because fish die very easily in transit), and the pay is less.

To collect ornamental fish you need to understand the behaviors and patterns of dozens of species—where to find them, how they tend to swim and move, how they respond when threatened. However, for many species, the capture techniques are similar.

Like coral, profit from ornamental fish comes from volume—so the methods are designed to catch as many fish at once as possible. The most commonly used method relies on a special kind of net and techniques of corralling fish, like herding sheep.

This net typically has two long arms which extend out from a central pocket, forming a rough V shape, like the corner pocket of a billiard table. The tops of the net are fixed with floaters, and the bottom with small weights, so that you can set it up on a reef and it will stand on its own. Using some kind of long probe or stick, the divers will then swim along the patch of coral in which the target fish are hiding, and poke and prod into the reef in order to drive the fish towards the net. The fish hit the long arms, and then are driven into the pocket area, where they can be scooped up with a small scoop net. It is easiest with two divers, one working each half of the patch (to keep the fish from just swimming back out the other side—but Imran is skilled enough to do it on his own.

Doing this requires knowing in advance which kinds of coral the fish you are after like to hide in. Time after time I was shocked to see how many fish Imran was able to scare out of the rubbly understory of a little reef patch; perhaps only one or two fish had been visible before, poking their heads out of their hiding spots, but within a few minutes the nets were filled with hundreds.

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In September, I arranged to rent some SCUBA equipment for a few days so that I could observe Imran at work more closely and have more time to do detailed observations of the reefs around Nambowatu. This was four months into the coral closure, so he was only collecting ornamental fish.

By this time, the *Two Sons* was languishing in disrepair; Imran had purchased a different small boat as a stop-gap measure in order to keep diving. The crew of the *Two Sons* had dispersed; Nasir had gone back home to take up his old job as a travelling sago salesman. Fahad was working odd jobs around the village and helping out in the orchards.

Donny disappeared after hinting that he would go work in oil palm plantations opening on the provincial forest frontier. And so, most days Imran was diving for fish completely alone.

Diving alone is more dangerous, and more work, it also means he doesn't have to share his profits with anyone. All the money he pulls out of the sea goes toward paying off his new small boat, and saving up to build a new, bigger boat—to funnel money into the productive assets that would allow him to continue working. If and when the coral trade re-opened, he vowed he would be ready.

Imran uses different equipment for diving for fish. Instead of basket, chisel, and hammer, Imran dives a long, sharpened metal rod (which doubles as a spear for spearfishing), as well as a little two-pronged rake, a fine net with weights and floats, and a wad of plastic bags. By contrast, with my SCUBA gear, I am heavily encumbered: a huge aluminum tank for air, a regulator with emergency second stage, a wrist watched shaped diving computer, a Buoyancy Control Device (BCD; a donut tube of air that I wear like a parachute). Attached to the harness of my BCD I have my camera, an orange emergency whistle, a metal wand. Imran pokes fun at us for the quantity of gear SCUBA requires, and we all laugh. He's not wrong.

It is not easy to keep up with Imran underwater. Underwater he is decisive, fast moving, quick eyed, and he wanders through the reef like it was his own garden, hopping from patch to patch, and swimming faster than any recreational scuba diver ever would. In the middling murk of poor visibility, I lost him more than once. Eventually, he spots a patch of reef to target, and sets up. He stretches the net along in a shallow curving arc, partially obscured (from the fish's point of view, anyway) by coral. Then he often grabs a few pieces of coral, usually vase-like or large leaves, and leans them together to make a sort of dome or tent like tunnel leading directly into the net. This is the funnel, but the purpose, he later tells me, is so that the fish are not scared and will swim toward the net, rather than away from it. They think they are swimming into a safe little cave formed by coral colonies, when

they are really swimming into his net. Once the net is in place, you swim wide around the patch you are targeting, exploiting the tendency of the fish to swim into the reef, rather than away horizontally.

Depending on the type of fish, then the herding begins. Today Imran is targeting "ikan kaling kepala merah," or the red headed wrasse, *Halichoeres rubricephalus*. With the nets in place, he begins. Imran holds his two long tools, one in each hand, extended outward in a v formation, and swims gently along, driving the fish toward the decoy coral tunnel. Once you have them in the tunnel, then one prod, and they swim furiously into the net.

Many of the ornamental fish in the trade are cheap and die easily in transport. These wrasse are the opposite: extremely hardy, difficult to kill, and worth a fair amount of money as far as ornamental fish go: IDR 15,000 at PT. Cipta, 30-40,000 for other sellers, including PT. Intan, who lately Imran has been selling to, saying that he has switched teams "for the moment." Because ornamental fish are considered "non-CITES," or not governed by the normal CITES rules, the divers were not bound by the permit system to sell to the same boss—so Imran is free to sell to whomever he wants.

The number of these red-headed wrasse that he can get per day varies "depending on your fortune," he says. Over the course of two days, Imran collected a total of about 25, averaging anywhere from 1 to 7 per dive. He spends a little over an hour on average per dive, and usually does 2 per day. This gives him: 25 x 35,000 = 875,000. This is pretty good for two days. The price for this fish is comparable to some corals, and more expensive than many corals. Plus, PT. Intan treats him much better than Pak Rajin, and covers all his expenses and food. As an added bonus, the warehouse is even closer to his house.

⁂

A few months later I went ornamental fish collecting with Imran's brother-in-law Armin, who lived across the bay from Nambowatu. Armin's team was himself, his brother-in-law Fildan, and Latif, the diver who lost his hearing during a diving accident (both introduced

in chapter 2). Early that morning, Armin's phone rang: it was Pt. Cipta, Imran's old boss. A specific order had just come in from headquarters in Bali—and they wanted Armin to fulfill it as quickly as possible: 200 "KKO," (Solor wrasse, *Cirrhilabrus solorensis*), 300 "Bluester," (*Chrysiptera hemicyanea*), and 100 "Dianfish," (I think genus *Paracheilinus*).[62] This seemed like a lot to me, and I was surprised when Armin said they could *almost* do it, except for the bluester, which they needed to go to another place to get. They would try to get most today, and the rest tomorrow. Pt. Cipta agreed and hung up.

We would look for KKO first, and Armin knew just where to go. They started up the engine, pulled up the anchor, and we headed toward the edge of the reefs surrounding Pulau Hari, toward the back of the island. Armin and Fildan slowed the boat, staring into the water, looking for a very specific place. Finally, we stopped, perched near the crest of a shallow reef. They dropped anchor, pleased that they had arrived in exactly the right spot.

I was skeptical that he could just pull up and find the exact fish they were looking for; this made Armin laugh. They had done this many, many times. How did they know? I asked; Armin explained: everyone knows that KKO fish like dead coral: this spot had been bombed for years, and was reduced to rubble: their favorite. As they geared up, I got in first to inspect. Descending only a few meters to the bottom, I was shocked to be surrounded by hundreds of brightly colored fish, the KKO that he was looking for. The reef crest was indeed mostly dead coral rubble, and these fish were everywhere, swarming like butterflies as bright, golden beams of sunlight rippled around them, illuminating their glistening forms. They were gorgeous.

Armin and Fildan got geared up, and descended to a shallow depth of around 3-5 meters. Their method here was very different than Imran's approach of using a small net and two sticks. These two brought down a *huge* net. It must have been 5-7m on each side, shaped like an obtuse V (I would later see Imran use a similar net instead of his older smaller net; the nets themselves were increasing in size as the fish were decreasing in abundance).

Figure 28 (top): Solor Wrasse “swarming like butterflies” | Figure 29 (bottom): Solor wrasse in a net

At the vertex there was additional netting at the top and the bottom, creating a kind of enclosure, like a box. The net has floaters and weights attached, so that it stands on its own when put into place. They find a good spot, anchor the vertex, and then roll out the sides, tucking it in amongst the dead and living coral, sometimes picking up a coral and using it to stretch the net out a bit. They are trying to create a slight angle, so that the walls of the net are angled inward slightly, presumably so that the fish don't escape over the top, though this seemed unlikely because the net was so huge—about 1.5m in height.

Once the net is in place, they proceed to herd. They do this by using long prods made of PVC or iron, holding them in a wide v like Imran usually did, and then slowly pushing the fish toward the area of the net. They both worked simultaneously on either side of the V, pushing the fish together into a large ball. Then, amazingly, Fildan took the hose connecting him to the surface, and wrapped it around two large corals, tying it in a knot, which weighed down the entire hose. Armin grabbed one part of the hose, and Fildan grabbed the other, and they slowly pulled it along the seafloor like a trawl or a boom—a modified rolling pin method—driving the fish into the net, into the catchment area, where Armin then pulled up the slack at the bottom to contain all the fish in the little box at the end. Fildan took over holding the net closed, and Armin grabbed the little butterfly net and started scooping up the fish from the boxed in area. They got hundreds in one go (Figure 29). He filled up the little net, and brought it to the surface to deposit them, and then came back down to go again. It took two full small nets to get all the fish. The whole thing took only about 20 minutes from set up to tear down.

Back on the surface, they sorted and plucked out the fish they were after. They had a little floating basket contraption which they filled with the fish while they worked on the surface so that they could have clean water. These fish, KKO in particular, are incredibly easy to kill. I saw some which had died on the surface of the seafloor just from the collection process. From that moment until they were taken to PT. Cipta, they were constantly

changing the water, constantly scooping water in and out of the container to keep fresh, probably oxygenated, water in circulation. They joked that they are called "KKO" because of "KO" knock-out! They counted their catch: more than 200, more than was ordered, all in 20 minutes.

Conclusion

Divers come to know reefs in many ways—as places, as landscapes, as multispecies worlds, and as a fractalized web of commodity categories with constantly fluctuating price tags. Through the work of diving, they elaborate old commodity categories, and generate new ones as they keep their eyes open for anything that may yet "have a price." Accumulating this kind of knowledge takes practice and time—and requires attuning yourself to other lifeworlds as well as to the vagaries of global markets. You keep one eye on the reef, and another on the trends moving through the coral world.

This is the work of learning how to see fortune on the reef. It is the play of working within and through overlapping ways of knowing the reef and its abundance that allows divers to turn coral and ornamental fish into exchange value and fortune. In the process they also change themselves—becoming something new as they modify their own sensoria, both for the market and for the challenges of the underwater world. They learn to see color in new ways, and learn the habits of rare ornamental fish, or the preferred habitats of precious corals. They build elaborate maps of reefs in their minds, and then through their collecting, leave their trace. They become attuned to the reef, becoming part of it.

In turn, divers learn to notice historical changes on coral reefs. In some cases, as in Imran's work aboard the Hong Kong Ships, they even radically transform the ecological structure of reefs themselves. They etch themselves and their labor in the supply chain into the reef—and the reef in turn etches itself into them. Everyone is transformed by the encounter of fortune seeking.

However, these divers are not the first ones to leave their mark on the reef. Kendari has for centuries been a key node in global circulations of marine products—and the pursuit of fortune based on these reefs has created an ongoing structure of inscriptions in the seascape. It is to these histories—longue durée echoes of fortune seeking on the waters of Southeast Sulawesi—that we now turn.

INTERLUDE

Hioko Tobelo II

In 2017, just before I started research, a hit song began sweeping across Eastern Indonesia—"Hioko Tobelo II" by Yopie Latul (not to be confused with "Hioko Tobelo I", the same song recorded by a different artist). It is carried by a zippy synthesizer hook and smooth baritone vocals which despite its melancholy sounds happy while riding the glitz of the tune, checkered with 2000s hip-hop inspired sing-rapping. These alternating vocals all float above a generous sprinkling of barely audible layered tracks (including what I'm pretty sure is a sample of Usher's 2004 smash hit "Yeah!" ft. Lil Jon and Ludacris). The song blew up, and became a recurring soundtrack to my research, popping up nearly everywhere I went—on busses, on ferries, blasting out of home stereo systems—but especially at parties, where it was always played at least once, preferably four or five times, to provide ample opportunity to dance a silly, joyful line dance that is a perfect match for the culture of group and circle dancing which is the zenith of every good celebration in Eastern Indonesia.

The lyrics are in Maluku Malay with a smattering of Tobelo—the name of a language, an ethnic group, and a place in the northern corner of Halmahera in North Maluku. But the words are close enough to Indonesian that right away I understood that it was a song about missing home:

Sailing far, Sailing far
Leaving my village far behind, oh mama!
How long, how long?
When will I return there?
Always dreaming of Tobelo

I am missing, I am missing
Tobelo, so far from the eye, oh mama!
What pity, what yearning
I am missing you all

Maluku is famous throughout Indonesia for its music culture, where hundreds of artists and small labels constantly pump out new hits, usually with a music video, which then circulate across Eastern Indonesia on bootleg CDs, flash drives, phone SD cards, or online via YouTube, WhatsApp, or Facebook. The songs sometimes break into the Indonesian mainstream—and Hioko Tobelo was one of these. The song elicited a spontaneous trend of groups of people—bank tellers from a local branch, teachers from an elementary school, a wedding party— recording themselves dancing in coordinated groups and uploading them to YouTube, where they would duke it out in the comments to see who did it best. Online fitness gurus lauded the dance's many physical benefits, including gaining muscle mass and improving memory; in 2020 prisons forced inmates to do the dance for recreation, wearing masks, to be put on YouTube.

> *The heart wants to return,*
> *Wishing to see mama, papa, and brothers*
> *Cannot bear missing the mountains*
> *Beautiful Tobelo, we will always be proud*

The song mixes melancholic lyrics with euphoric music, capturing the dual emotions of being far away: excitement and pleasure mixed with longing and loneliness. Indeed a big part of the popular resonance of the song is the subject matter, which is nearly universal in a country where people move in all sorts of ways to make a buck or make ends meet or make a new family, leaving home behind forever or for now. This historical reality of movement has always been followed by cultures of songs about travel, adventure, and missing home (e.g. Kaartinen 2010; see also Fraser 2015; Byl 2014). Mary Steedly (1993: 48), in writing about histories of Karo travel in Sumatra notes while the pop songs of a neighboring ethnic group "are all about education and mothers, Karo songs are still mostly about leaving home." I felt it at the time too: I was far away, on distant shores, missing my friends and family, trying to find my luck. The song was like a constant companion, but also one that made the sadness of distance into something to celebrate: a chance, an opportunity.

This culture of young people, especially young men, leaving home to find their fortunes abroad is old and widespread across Indonesia. Today it is often referred to by the Minang word "merantau," which makes a verb out of the word for "frontier." Frontiering, or merantau, is a chance for youth to strike out on their own, to go abroad and search for their fortune. The foreign terrain of the frontier at land or sea offers a chance to acquire new knowledge, wealth, and skills, and as a calculated form of risk promises the chance of getting lucky. But an integral part of merantau is the return, whether physical returns home, or monetary returns in the form of remissions, where one's successes abroad are related back to kin. In the more maritime context of eastern Indonesia, you're just as likely to hear that someone is "looking for luck." In the Bugis language of Sulawesi, the person who goes looking is called *pasompe*, which means wanderer or migrant, or more literally, "sailor," a figure which Lineton (1975: 174) calls a "nameless culture-hero" which represents the far travelling ambitions of Bugis society. Luck, or fortune, can be found anywhere out there in the world for those willing to search.[63]

Happy or sad, we bear it
Life on the frontier, far from home
Feels so far from help.
Far from Tobelo, mercy I miss it!
The heart wants to return, tears fall

After a few months in Kendari, I finally made the time to start reading a doctoral dissertation outlining the early modern history of the very coastlines I was getting to know—what the author, historian Esther Velthoen (2002), called "eastern Sulawesi," stretching from Buton in the south to Banggai in the north, with Kendari and its coastal hinterlands in between. But as I read, I nearly spat out my tea when I came to a passage invoking the title of my new favorite pop song: "the Tobelo gained a fearsome reputation as maritime raiders … their ships were decorated with human skulls, and their shields

adorned with human hair, including blond, northern European hair" (Velthoen 2002: 216-217).

Tobelo, it turns out, was more than a 2017 smash hit—it was a word that invoked a past of roving mobility, giving name to one of the most powerful and far-flung groups of slavers, raiders, mercenaries, and merchants to sail the seas of Eastern Indonesia in the age of commerce. Indeed, my best guess is that "hioko" may be related to the Malay word "hikyat," which invokes the sense of an epic, mythical story—a saga or a chronicle. Perhaps it is fitting that on the album cover of Hioko Tobelo II, Yopie Latul is wearing an American football jersey… from the Minnesota Vikings, bling as nostalgia for the raiding days of yore, straight from the heart of empire.[64] Regardless, the Tobelo story—"Sailing far, sailing far, Leaving my village far behind, oh mama!"—is the story of the coasts of Southeast Sulawesi, a story of coming and going, of wandering and looking for your luck, one where the coastlines were filled with riches and emptied of people.

CHAPTER FIVE
The Empty Coast

While the origins of Nambowatu are somewhat murky, there are a few things that most people agree on—the main one being Nenek Koda.

Nenek Koda first set foot in Nambowatu in 1912.[65] He was a trader, seaman, and the skipper of a tall sailing ship; in fact his moniker "Nenek Koda," Imran explained, was a derivation of "nahkoda," an old Persianate word used across the Indian Ocean world for ship captains in the age of sail. Nenek Koda's story first came up in a conversation about famous local people with magical abilities, because although he first arrived in Nambowatu in 1912 as a fully grown skipper on a ship, he is still alive and well today, living in Wawonii—making him at least 130 years old by most estimates. As he aged, his title "nahkoda" morphed into "Nenek Koda" ("nenek" means grandparent, or elder). I was told that he lives in a settlement called "Cigarette Town," named for its history of cultivating high quality tobacco. Despite his age, he is still sharp as a tack, mind clear, a complete set of teeth, and perfect vision: he has a tiny Koran the size of a ring box—and can still read it without glasses or anything. Imagine!

Nenek Koda's magical fortune-seeking exploits are famous. Once he was piloting a ship moving cargo from Surabaya to Wanci, in the Wakatobi archipelago, when in the middle of the voyage a rogue wave ripped a hole in the hull. "Listen! Now if you didn't have ilmu—magical knowledge—that ship would already be at the bottom of the ocean!" But Nenek Koda declared: "we will arrive at our destination—and only then will the boat sink!" Indeed, the boat made it Wanci, and as soon as the last crate was unloaded from the hold, it sank into the bay.

Nenek Koda would use his ilmu to get from Wakatobi to Singapore in just three days with only a sail—even the steamer ships of his era couldn't come close to that speed!

Other times, when chased by pirates, he would steer his ship directly over a coral reef at low tide; because of his magic, he would glide right over, while the unskilled pirates behind him would get stuck on the shoals. Another time, a huge metal ship got stuck on a reef. After several days, someone finally thought to call Nenek Koda, who arrived and promptly slapped the boat on the butt three times—and it slid right off the reef.

These stories of Nenek Koda capture the memory of maritime life around the turn of the 20th century—a time of pirates and colonial ships, but also of the alluring promise of free trade indexed by the figure of "Singapore," with its boundless opportunities to get rich for those brave, skilled, and enterprising enough to try. As a founding figure of Nambowatu, Nenek Koda emblemizes these qualities.

And an important part of Nenek Koda's story—the reason that villagers knew about him at all—is that he was the first person to "set foot" in Nambowatu in 1912—and he was just a visitor, he didn't stay. This offers an upper limit to the history that most people imagined for the village—everything else was just speculation. At the time, Nambowatu was "empty," everyone told me—there was "nothing" here except mangroves.

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This chapter examines the historical legacies of violence and displacement that drove settlement patterns along the shores of Southeast Sulawesi—the processes that cause a place to be "empty" of people at one time, and then full of them at another. These shores, as full of riches as they are, have always been contested grounds, caught between competing claims of authority and sovereignty of far-off powers (Velthoen 2002). As a place on the edge of the map of power, a place where the distal edges of competing empires overlapped, the coasts of Southeast Sulawesi became a kind of perpetual frontier. For centuries Southeast Sulawesi communities have navigated these shifting political winds.

When I began researching these stories, my goal was to understand the Kendari area's place in regional history, including its historic role as a source of valuable marine

products. But in the process, I kept coming across descriptions of the coast that were radically different than what I had seen: historical sources consistently referred to the coasts of Southeast Sulawesi as "empty." My experience was the opposite: the shores of almost the entirety of Sulawesi are dotted with villages, wherever there is an appropriate place to do so—villages and small islands often bursting with people—not even room for a soccer field. How to explain this difference? The answer, in short, was violence—a story of how violent forces drove migration in one direction, away from the coasts, before another set of violent forces drove people back toward the coasts in the 20th century.

Indeed, the history of the Kendari area is one of blurred lines between practices of fortune seeking and violence. The fortune that was sought came from the region's immense wealth of natural products—iron from the hills, rattan, wax, and damar from the forests, rice and other crops from the fields, sea cucumber, turtle shell, pearls, and shark fin from the sea, and prosperous polities full of people. The violence came as all manner of techniques to control and benefit from that wealth—colonial monopolies, mass enslavement, piracy, and coastal raiding.

This history is key to understanding settlement patterns today—to understanding why the coasts are so completely settled along every foot. It is thus also central for understanding the emergence of the maritime oriented commercial cultures of which the live coral trade is just one part. As people were displaced to the coast, often becoming landless in the process, they turned to the sea as a source of livelihood, a space of semi-freedom that allowed them to avoid the bonds of wage labor.

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The assertion that "Nenek Koda first set foot in Nambowatu in 1912" was repeated with remarkable consistency. 1912? The year seemed arbitrary, simply a marker of a semi-deep past, until I began searching for written sources on the history of Kendari.

At the time, around the turn of the 20th century, the waters around Southeast Sulawesi were famously dangerous—full of pirates and dotted with dangerous reefs. This danger created an important niche for the expert, even magical, abilities of local sailors and pilots like Nenek Koda, whose intimate knowledge of reef systems, coasts, tides, and winds allowed them to navigate the seas in the pursuit of fortune (Gaynor 2016; see also Ammarell 1999). These pilots were sought after experts, hired by visiting ships of all kinds where they would come aboard and steer them through the trickiest parts of the sailing.

One such place, it turns out, was Moramo Bay, and much of the waters around Kendari. The Dutch themselves had largely avoided sailing into the Moramo Bay for 80 years, believing it to be unnavigable for large boats, full of hidden reefs that would scuttle their ships. Indeed, in July 1913 the military post commander for Kendari, 1st Lieutenant in the Oost Indische Leger (the East Indies Army), Fritz Treffers (2014) wrote that only "in the last 2 years," presumably since mid-1911, "has she [Moramo Bay] been repeatedly visited by the K.P.M. boats [steamships belonging to the Royal Parcel Shipping Company]." The timing is uncanny: was Nenek Koda aboard one of these ships? Piloting it with his magic? Deftly dodging the reefs?

Treffers visited the bay himself several times, and suggested that given its sheltered position, this would be a good place to park and hide warships, should the need arise (one wonders if this advice was later heeded by the Japanese Imperial Navy.) And of the peninsula where Nambowatu sits today: "The mountain range in this part rises steeply from the sea, is impassable, and is completely covered with forest." Indeed, along with his account, Treffers included a map he made himself that names small settlements around the province—but shows none at all on the entire Tanjung Peropa peninsula. This might seem to corroborate the idea that in Nambowatu there was "nothing" but mangroves.

But not all accounts agree; my friend Udin grew up in a neighboring village. I heard from Udin, who heard it from elders he knew, that during the era of Dutch colonialism and

pirates (which they simply refer to as "Zaman Kompanye" or the "Company Era"), there was magic on that neighboring village to keep it hidden; those with bad intentions [meaning pirates and the Dutch] could only see fog and cloud, while good people [those searching for a better life] could see the village behind it.

The relationship between the two villages was often expressed in kinship terms: Nambowatu was the "younger sibling," much newer—not even having been tread upon until Nenek Koda arrived in 1912. Indeed, aside from those who moved in since the 1970s, I don't think I spoke to anyone who didn't have a story of their parents or grandparents moving to Nambowatu during the tumults of the mid-20th century that spanned the period between Japanese invasion in 1942, the end of the war in 1945, the Indonesian revolution, the subsequent widespread guerilla rebellions of the 1950s and 60s, and the coup and mass slaughter of leftists in 1965. People came to Nambowatu seeking safety and opportunity, drawn there precisely because it was out of the way of the big players in these historical dramas.

Indeed, Imran's brother-in-law Armin, who lived across the bay but grew up in Nambowatu told me that it was his grandmother—Mama Eka's mother—who was the first one to "find" Nambowatu in the 1950s. The story was one of making a new home on the run. But running from what? Haltingly unsure, Armin tried to explain: "That… that was the gangs… you know, before. When there used to be all those… gangs? Who were they? You know, those… those gangs. During Dutch colonialism—before."

While at first, I found this answer confusing, it later proved an important point. Armin's confusion about *who exactly* were the aggressors in this story was common, often even among those who lived through it as children or young adults, and it captures the reality of the period as one of chaotic struggles for power that were fought with seemingly random acts of unspeakable violence by all manner of groups—first the Japanese, then the Dutch, then the nascent republican military and police and the "gangs" of Islamic rebels

who opposed them, and even groups of roving petty thugs taking advantage of the fog of war. You could trust no one—and you could never be sure the identity or source of the violence: "Those gangs… who were they?"

Ordinary people were caught in the cross-fire of these big political and ideological struggles. For those who remembered it as children, the most common image was fire and smoke: the random burning of houses, fields, forests, and whole villages on the mainland as all sides of the conflict embraced the tactics of scorched earth. It is an image that also harkens back to earlier periods of the chaos of violence—where unknown bands of pirates and raiders and colonizers harangued these coastlines, robbing and doing battle with each other in search of fortune, with ordinary people caught in the crossfire of imperial contest.

In the end it was being on the run that filled the once "empty" coasts. As Armin put it, describing his grandmother's flight to safety: "Run! Run! And then you make a village there." And so, people fled to the safety of a place nobody in power cared about—the place that would become Nambowatu. But before we can tell that story, of fleeing to the safety of an out-of-the-way shoreline, we need to step back into the past, to a time when the coasts were still empty of people—or at least hidden by a magical fog.

The Empty Coasts

In 1687, the English pirate William Dampier sailed with a crew of buccaneers down the East coast of Sulawesi, and wrote that excluding a fleeting brush with a small fleet of local ships near Banggai, in the entire stretch of hundreds of miles down the eastern coast they did not "ever see any other Boats, or Men, but only one fishing Canoe, while we were about this Island; neither did we see any House on all the Coast." One hundred and fifty years later, the Dutch government official J.N. Vosmaer found much of the coast similarly empty. In 1835 he wrote that the island of Wawonii, Imran's home, 40 kilometers off the coast of Kendari:

> Was once inhabited by an agricultural people… [but] persistent incursions of the Tobelo pirates have driven the population from there for the past fifteen years … It is generally said that it is now completely depopulated; though, having visited the island in person in many places, I have found there the traces of the presence of men, who seem to no longer show themselves; so many have remained on the island, but keep away from the beach. The pirates still visit very often. (Vosmaer 1835: 110).

Southeast Sulawesi coasts were a mostly empty place for hundreds of years—until the late 19th century. Try living on the coast and you would certainly be snatched up by endless waves of raiders and pirates spinning out from the slaving capitals of the maritime trading world. This is not to say that there were no people living here or using the shoreline—there were. But people were forced to choose between either

living away on hilltops, cliffs, and forests away from the shore, for protection from people like the Dutch, the Tobelo and William Dampier,[66] or to settle in and around the fortified coastal polities controlled by the raiders themselves.

Indeed, by the late 17th century, the period of Dampier's voyage, Sulawesi had become a primary source of enslaved people shipped to Dutch controlled port cities like Makassar and Batavia (Raben 2008; Vink 2003), as well as to indigenous controlled trading networks outside of European control. Slavery and slave raiding were already existing institutions in Southeast Asia before the arrival of Europeans, which we know thanks to Tome Pires' *Suma Oriental*. [67] But the European intrusion into the commercial sphere seems to have driven the marketization of slavery—to procure labor to produce commodities for world markets. Pepper cultivation, for example, was extremely labor intensive and enslaved people were used across the archipelago (B. Andaya 1993; Reid 1993). In Banda, the Dutch planters imported slaves to work the nutmeg orchards, and in Sulu, marine product collection was done primarily by enslaved labor (Warren 1981).[68] Meanwhile, the completion of the Dutch monopoly on the spice trade through control of Maluku and Makassar in the mid-late 17th century meant that elites from small polities needed a new

commodity to exchange for trade goods—in many cases that commodity became people (Velthoen 2002: 84). Smaller polities then became accumulation centers for people captured by local raiding networks, who were then sold on to larger market centers like Makassar and Batavia.

When William Dampier reached the Muslim coastal polity of Kulisusu in Northern Buton in 1687, he noted that their primary source of revenue was to capture people from the non-Muslim communities located in the interior and sell them into slavery. James Warren describes the process of raiding at the time through "coastal scouring," where parties of raiders would "sneak up on unsuspecting people out fishing in sampans [small canoes], collecting mangrove wood, or collecting shellfish" (Warren 2002: 239).

Across eastern Indonesia and much of the Philippines, raiding was often simultaneously an act of war, an act of commerce or accumulation, and a ritual endeavor.[69] Raiding was a way to capture commodities and people to sell, and was part of military campaigns, just as in Europe: sacking the city was about military victory and gathering riches. It was also a way to gather people to join your polity—by capturing them and transporting them to your polity, they enhance your own power. As historians of Southeast Asia have long argued, since land was abundant and sovereignty not always tied to territory, the power of rulers and kingdoms was measured through their ability to attract and retain people (Reid 1983; Junker 1999). Being able to control and marshal subjects—as warriors, traders, farmers, or slaves—was the key to power. Strategies varied: when charisma or tax incentives failed to work, there was always violence, or the threat of violence. Under these circumstances, people had little choice—either live in the hills away from the shoreline or move to the center of the violence itself.

On the east coast of Sulawesi the local spot was Tobungku, a coastal polity north of present day Kendari, whose power grew from its access to important sources of the nickel rich iron found in the interior montane lakes. Tobungku swords were famous across

Maluku, and success from trading these gave rise to a powerful kingdom which developed early rice agriculture. In 1580 the hongi led by Sultan Babullah of Ternate had conquered Tobungku, introducing Islam and bringing them under vassalage: both slaves and swords became part of the official tribute demanded by the Sultan of Ternate. Much later, Tobungku became a haven for pirates and raiders under the protection of the Sultan, becoming a launching base for raids and a point of departure for slaving networks which drew on the diasporic communities of Iranun raiders from the Philippine island of Mindanao, as well as Tobelo raiders from Halmahera.

Perhaps counterintuitively, the violence of Tobungku was also its most forcefully attractive feature; better to settle here and be protected than to live elsewhere and be a target. At its apex of wealth and power, Tobungku was the only place to be; as James Warren (2002: 157) writes, "whole communities of migrants and refugees, fleeing from endemic unrest, settled in relative security along Tobungku's shoreline and became involved in procuring pearls, tortoise shell and tripang, or cultivating rice and sago." Tobungku also increased its populations rather more directly; for example, in 1822 after the sack of Kulisusu, raiders captured hundreds of people and simply moved them to Tobungku to increase the population. This movement went both ways: a century earlier, when the king of Tobungku died unexpectedly, half of his subjects decided to high tail it to Buton, because they heard that the Butonese Sultan was planning an attack: if you can't beat 'em, join 'em.

Tobungku had long been a kind of scammer's paradise. From the mid-17th century, it got its start as an important alternative to Dutch controlled ports with their ludicrous taxes and pretensions to monopoly. The state attracted Sama communities to gather marine products, inland peoples to collect forest products, and raiders to collect slaves, while drawing in merchants from across the archipelago looking for a good deal (and no taxes). After the Dutch took Melaka in 1641, Malay and Bugis traders from that city were hoofing it thousands of kilometers east to get cheaper goods from Tobungku (L. Andaya

1993). Yet because it was technically a tribute-paying vassal state of Ternate—the preeminent power in the spice trade and signature partner of the Dutch—Tobungku was largely shielded from Dutch aggression who took to calling it a "smugglers dream," (where smuggler meant anyone who didn't want to pay Dutch taxes or respect the monopoly). But although it was supposedly wed to Ternate, Tobungku played all sides at once, courting other nearby states—the Bugis sultanate of Bone and its rival Gowa in Makassar—as outlets for its slaves, iron, and smuggled spices. Dutch observer Valentijn, writing in 1720s, noted that "foreign traders and Bugis smugglers, who often lurk on the river Lahan, to the north of [Tobungku], to obtain rubber and other forbidden wares" (quoted in de Clerq 1890). Not long after this, Tobungku had become the most important tripang collection point on the east coast, frequented by Bugis traders [and possibly Chinese]. Meanwhile, throughout the 17th century when the Dutch were desperate to get their hands on tortoiseshell, one of the most valuable products in the trade with China and India, Tobungku was swimming in it, and its merchants and collectors got rich by beating the VOC at its own market game (L. Andaya 1993; Sutherland 2011).

Things changed in the mid-18th century. First came a radical transformation in the structure of transoceanic exchange: the demand for sea cucumbers, better known in Indonesia as tripang. Consumption of tripang in China grew significantly during the 17th century (Dai 2002; Sutherland 2000), and merchants moving between China and Indonesia began trading tripang in larger amounts. Demand greatly increased in the late 18th and early 19th centuries, and tripang became a lucrative commodity, with Indonesia and the Philippines as key exporters, and with Sulawesi as the center of the Indonesian supply. Tripang, along with other marine and forest products, came to assume a pivotal role in the world political economy of the turn of the 19th century; these were among the few products which European, especially British, traders could use to trade in exchange for Chinese tea. The demand for tripang re-worked the balance of trade, and made the rich coastal waters

of Eastern and Southeastern Sulawesi central to the action. Tobungku and Buton both became hubs of the trade, sending traders to meet Bajo fishermen in prime fishing grounds to purchase the goods, which were then brought to the city to be sold to merchants from Makassar.

The second change came with the rebellion of Prince Nuku of Tidore against the VOC, which upended the political order of Eastern Indonesia (Widjojo 2008). Nuku gathered many groups to his cause, and his tactics relied heavily on the long tradition of raiding. He recruited fierce groups of warriors to harass the Dutch and their Ternate allies—including hundreds or thousands of Tobelo warriors from Halmahera. These displaced raiders formed a diaspora that became famous across Eastern Indonesia for their exploits, and one of their most important bases of operations became Tobungku, where hundreds settled under the protection of the sultan.

Tobelo raiders took advantage of the weak Dutch position and joined forces with Maguidinao and Iranun raiders venturing south from the Philippines, and from the late 1700s harrowed the coasts of Southeast Sulawesi with such intensity that the shores were emptied. Warren argues that for those "haunted by the loss of their homes, land, and independence," the ensuing decades of raiding offered "a distinctive chance to exact revenge against the VOC" (Warren 2002: 157; see also Widjojo 2008). Thousands were captured in the raids; everyone else ran away, beating a swift retreat to the interior. Pirates and raiders became a fact of life, like the monsoons. If you wanted to get anything done, you played their game—or just as likely, you were one of them. And the enduring memory of this period is remarkable. Velthoen (2002: 218) notes that in Tobungku "in the 1990s children were still frightened into obedience with the threat that the Tobelo might come and get them."

1669: BBM

Southern Sulawesi has an old reputation for seafaring, and more pointedly, for an entrepreneurial culture that has spread around eastern Indonesia as seasonal trade, long and short-term migration, small enterprise franchisement, and economic frontierism. The groups behind this entrepreneurial expansion are sometimes jokingly referred to as "BBM," short for Bugis-Buton-Makassar, the three ethnic groups most associated with this way of life (the joke part is that BBM is also short for "Bahan Bakar Minyak," or petroleum, as well as the now defunct but previously very popular BlackBerry Messenger). The pithiness of BBM flattens the truth of Sulawesi's ethnolinguistic diversity: Bugis and Makassar refer to two related ethnolinguistic groups, but are each themselves umbrella terms containing subgroups and dialects of South Sulawesi; a third closely related group similarly famous for seafaring, Mandar, is missing entirely from the joke, though sometimes swapped in as the "M." "Buton," on the other hand, glosses the huge linguistic diversity in Southeast Sulawesi, referring to dozens of ethnolinguistic groups formerly subject to the Sultanate of Wolio on Buton Island; similar to the Mandar, one of the "Bs" is sometimes swapped for "Bajo," as in the Sama-Bajo. This confusion around the specific components of the acronym proves the point: by the time these communities make it many hundreds of kilometers away, all that matters is that they're from the coasts of Sulawesi. Put differently, BBM refers not to a specific group, but to an entrepreneurial culture of frontierism.

The connotations of "BBM" shift depending on who you ask. At best, BBM refers to shrewd entrepreneurs who are seen as an integral part of regional economic development, bringing business acumen and commercial spirit to regions traditionally less interested in such schemes. At worst, it refers to vulturous outsiders who descend like a wedge, inserting themselves as middlemen between local communities, resources, and the outside world of trade, taking advantage of local situations to gain the upper hand. It was these latter sentiments which bubbled over at the turn of the millennium when bloody

conflict along religious lines split Maluku in half. In many parts of Eastern Indonesia, BBM folks came to represent the paranoia and cynicism of not being able to tell a raider from a trader—of not knowing if you were going into business or getting ripped off.

But where does the reputation come from? While massive Bugis outmigration during the mid and late 20th century under Suharto brought floods of BBM to the newly opened economic frontiers of Maluku and Papua, the story might begin much earlier. Already in the very early 16th century, Sulawesi was famous as a source of both raiders and traders—and the lines between them were always blurry and confused. In 1511, Pires reported from Portuguese occupied Melaka about two groups of sailors from "the islands of Macassar":

> These men in these islands [of Macassar] are greater thieves than any in the world, and they are powerful and have many paraos [ships]. They sail about plundering, from their country up to Pegu, to the Moluccas and Banda, and among all the islands around Java; and they take women to sea. They have fairs where the dispose of the merchandise they steal and sell the slaves they capture. [...] Those who do not carry on this kind of robbery come in their well-built pangajavas with merchandise. [...] They go about the world and everyone fears them, because no doubt all the robbers obey these with good reason. They have no power against the junks which can all defend themselves, but every other ship in the country they have in their hands. (Pires 1944: 226-227).

Pires' two groups—those who raided in smaller ships and those who traded in bigger ones—have often been read by historians as referring to Sama-Bajo (the raiders) and Bugis or Makassar (the traders) respectively (e.g. Pelras 1996).[70] However the fact that Pires mentions both raiders and traders in the same breath and with some confusion shows how mixed up all of this already was. To some degree this is exactly the point—the reputation of many groups lumped together, and the lines between them blurred beyond recognition.

Traders from South Sulawesi were already crisscrossing the archipelago since at least the mid-15th century (Andaya 1981: 19). But it was the Portuguese conquest of Melaka—exactly the reason Pires was even in Asia—that put Makassar on course to rise in

power. Melaka had been a cosmopolitan hub of commerce and free trade connecting Southeast Asia eastward to China and westward to South Asia and the Islamic world; after Portuguese conquest, many of the resident traders fled east to Makassar, and by the time that the Portuguese visited Makassar in the 1540s, Malay merchants from Johor were already well established there (Reid 1983: 137). Recognizing Makassar as an important entrepot, the Portuguese set up shop as well. While at this time traders were mainly interested in local Sulawesi products like turtle shell and rice, as well as enslaved people, as the city grew, it became an important entrepot for the goods of the vast Eastern archipelago—a meeting place between Maluku and the western port cities like Banten, Johor, Melaka, and Aceh. Throughout the 16th century it became both a gathering point for spices from the east, marine products from the sea, and a huge market in which to sell textiles and other goods (Reid 1983).

Makassar continued to rise in importance through the mid-17th century, especially as the Dutch advanced their program of conquest and monopoly by establishing Batavia and invading Banda in 1619, taking Melaka from the Portuguese in 1641, and solidifying their spice monopoly in the 1650s. Indeed, European conquest had the unintended effect of making Sulawesi and its hinter islands into the most important alternative commercial center in the archipelago. French, Danish, English, and Chinese merchant bases were established in the early 17th century, along with wealthy Arab and Indian traders; a few decades later, when the Dutch captured Melaka in 1641, waves of Portuguese merchants sailed east for Makassar (Reid 1983). Under Dutch control, Maluku's spice ports had become closed off—so Indonesian spice traders began to bring their spices to Makassar instead to sell to the Netherlands' European rivals. As the kingdom became the premiere entrepot for trading spices outside Dutch control, it rose meteorically in power and wealth.

But the rise of Makassar disturbed the see-sawing balance of powers among the indigenous states of southern Sulawesi. The Makassar kingdom of Goa-Tallo on Sulawesi's

Southwest coast had long been rival to the constellation of Bugis sultanates and polities found along the shore of the Gulf of Bone between the Southwest and Southeast peninsulas of the island—namely the small mountain sultanate of Soppeng, the coastal agrarian states of Wajo and Bone, and the oldest Bugis kingdom, Luwu. Throughout the 16th and 17th centuries wars raged across the southern half of the island, primarily pitting the Bugis kingdoms against their Makassar rivals. But while the Bugis kingdoms, especially Luwu, were once great centers of power, Goa-Tallo's rise to preeminence through foreign trade was parlayed into military might, and the Makassar kingdom was able to subdue the Bugis as its vassals (Andaya 1981).

Almost as soon as the Dutch arrived in Eastern Indonesia, they realized that Makassar, which openly welcomed traders from all parts of the world, would be a key roadblock to a total monopoly. After decades of unsuccessfully petitioning Makassar to limit trade and grant favorable concessions to the VOC, in the mid-17th century they began to plot the overthrow of the kingdom. Finally in 1660, they attacked and captured Panakkukang, one of the royal fortresses of Goa-Tallo, occupying it with a force of over 500 men.

Meanwhile, many of the aristocratic Bugis subjects of Makassar—forced into humiliating servitude and vassalage—sensed that VOC aggression offered them an opening, and they began plotting their own rebellion. The most famous of these Bugis leaders was Arung Palakka, a Bugis noble raised as a servant in the court of the Makassar king. As the Makassar court summoned Bugis nobles to help prepare the kingdom's defenses once VOC attacks became imminent, Arung Palakka and others saw an opportunity to ally with the Dutch to destroy Goa-Tallo and Makassar hegemony, restoring the Bugis kingdoms to primacy on the island.

Yet Arung Palakka and his compatriots from the most powerful Bugis kingdom at the time, Bone, were unable to persuade their fellow Bugis kingdom of Wajo to join their

cause. Although once a key member of a pan-Bugis alliance, Wajo had benefited greatly from close partnership with Makassar, and was bound by ancestral oaths of fealty sworn to the alliance, expressed through the Bugis idea of *siriq*, meaning honor or shame (Andaya 1981; Wellen 2015). Yet even without Wajo, the rebels amassed a sizeable army, and once the Dutch had taken Panakkukang, the Bugis drew Makassar into a bloody battle.

After months of warfare and a siege against the Dutch, the rebellions failed, the fort was evacuated, and Arung Palakka fled to the island of Buton, South of Kendari, where the Sultanate of Wolio was ally of the Dutch and sworn enemy of Makassar. Goa-Tallo then set about asserting its dominance over important vassal states, sailing in a hongi-like fleet around major polities of eastern Indonesia, attempting to assert its dominance and superiority over Dutch allied Ternate in Maluku. This angered Ternate and Buton which had pretensions to power and resented Goa's assertions of sovereignty. Arung Palakka and his followers settled in Batavia where they became mercenaries fighting for the Dutch against insurgencies in Sumatra and elsewhere, biding their time before they could return to Sulawesi.

Finally, in 1666, as Goa-Tallo continued to resist Dutch efforts to control its trade, the VOC with Arung Palakka and the Bugis rebels sailed back to South Sulawesi to wage war. They began pillaging and raiding coastal villages, burning rice fields and houses down the coast and sacking the city of Bantaeng. In a dramatic victory, the armada confronted Makassar forces which were laying siege to the island of Buton, and the forces surrendered, with thousands of Bugis conscripts defecting to serve the returned hero Arung Palakka. The Butonese joined the war, as did the leader of Ternate, and together this massive force brought war to the gates of Makassar—a war that would rage on for two years.

Makassar finally fell to the Dutch and Bugis forces in 1669 after they planted a bomb beneath the royal fortress of Sombaopu, blowing it wide open. Makassar was ravaged in the aftermath as Bugis soldiers pillaged the fortresses and then the city. Arung Palakka

became sultan of Bone and visited mass destruction on the people of Wajo who had remained loyal to Goa-Tallo until the bitter end. Campaigns of retribution swept through Wajo, as the armies of Bone killed thousands of people and kidnapped many more as slaves. Wajo people were forced to surrender in humiliating terms, and were forced to pay massive restitution sums to the Dutch.

It is this moment—the violence at the end of the Dutch conquest of Makassar—that the South Sulawesi diaspora would begin to begin to spread across the archipelago in vast numbers, eventually giving rise to pithy ideas such as "BBM." Indeed, in the violent and humiliating aftermath, both Bugis from Wajo and Makassarese from Goa-Tallo left by the thousands to seek their fortunes elsewhere. Some hoped to find new allies and muster enough force to return to liberate their homeland from the Dutch. Others simply sought new fortunes abroad, plying old trade networks and settling in coastal entrepots across Indonesia.[71]

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The Bugis emigrees and refugees of the Makassar Wars cast themselves across the archipelago, establishing petty states, inserting themselves into elite ruling classes and families, and becoming middlemen and important traders connecting indigenous products with foreign markets. The Bugis, in particular, married commerce with political aspirations as they ventured forth. Many made claims to royal heritage; for some this was true, but others may have exaggerated, stretching the truth of a minor nobility into royal power to impress locals, using their association with famous Bugis kingdoms to insert themselves into local ruling classes. Others simply started new settlements, crowning themselves as lords. Meanwhile every variety of trader inserted themselves as middlemen and intermediaries connecting indigenous trade goods with external markets (Sutherland). As historian Jacqueline Lineton (1975) writes:

> Bugis traders fitted into the interstices in European trade, collecting small quantities of goods from numerous insignificant and barely accessible ports of call, and dealing in commodities — such as tripang (seaslug), a Chinese delicacy — which Europeans shunned. They were even at times able to gain an edge over their Dutch competitors through their ability to bring a wide range of European consumer goods direct from Singapore to the eastern islands at negligible cost." (Lineton 1975: 178-179).

Among the destinations for Bugis migrants was Sulawesi's east coast, where a long succession of Bugis emigrees established themselves as rulers, traders, and middlemen with connections to wide trade networks, forming an integral part of the history of Sulawesi eastern shores—and a key aspect of the mythic and political history running up to the founding of Kendari.

Bugis traders became integral to the tortoiseshell trade in places like Tobungku, where they connected indigenous collectors with foreign markets, and married into local elite classes up and down the coast. Claims of descent which mixed Bugis and local indigenous elements became potent and recurring indexes of power. For example, around 1700, the Bugis chief Ladama settled at the estuary of the Sampara river just north of Kendari—today the site of a major nickel mining operation. Ladama married the daughter of the local Tolaki chief, eventually succeeding to rule, and giving rise to a lineage of chiefs of the Tolaki kingdom of Konawe, becoming known in Tolaki oral traditions as "Madukalla" (Velthoen 2002: 198-199). Ladama, however, seems to have come not from Wajo, but from Bone—the victors in the Makassar War—signaling that while many Bugis migrants were refugees fleeing chaos and persecution, others were part of a push to extend the power of the winners to all corners of the island, capitalizing on Bone's rising prospects to improve their own position. And the wrangling of political capital through association with Bone wasn't restricted to those friendly with the Sultan: even those exiled by the Sultan or who fled to avoid the law or who were enemies of the state could still wring a few drops for a performance of noble origin. It was a pattern that would repeat itself over and over—even

hundreds of years later, when in the 19th century another wandering Bugis nobleman would be instrumental in establishing trade at Kendari Bay.

1830: Turtle, Tripang, and Kendari

While spices were what lured Europeans to Indonesia and inspired them to pursue monopoly, by the 18th century (with the exception of pepper) their importance as a trade good had fallen considerably. As spices became more common, prices fell from their once dizzying heights, and cloves, nutmeg, mace, and pepper had become just ordinary commodities.[72] But by the 18th century, demand for a new commodity from Asia was growing rapidly: tea. Until the 19th century (when the English introduced tea plantations to India) China had a complete monopoly on global tea supply. But Chinese traders had little interest in inferior European goods. By the mid-19th century Britain's answer to this problem was to force opium on the Chinese market via the opium wars in the name of "free trade." But before this, the best way to get tea was to trade marine and forest products—agar-agar, turtle shell, pearls, shark fin, and most importantly, tripang or sea cucumber.

This shift in trade patterns would have dramatic implications for the East Coast of Sulawesi, rich as its waters were with these valuable marine products, and home to large communities of resident expert divers ready to exploit the goods. However, unlike other important trade goods that were cultivated in plantations, marine products were more dispersed and difficult to accumulate in large quantities. Procuring them required foraging and diving across vast areas of coastline, and aggregating sufficient quantities for export required large number of capillary feeder supply chains from far flung ports across the archipelago. But these supply networks didn't need to be totally built from scratch: instead, they built on the already existing supply chains for other products like turtle shell, which had been an important export to China for centuries.

Tortoiseshell fit well into the Dutch trading plans: like spices and silver it was a high value and low volume trade, and indeed not long after the VOC arrived in Indonesia,

they realized they could use the vast amounts of tortoiseshell as part of a triangular system; turtles to India in exchange for textiles and to Japan in exchange for silver, both of which could come back to Indonesia in exchange for spices, which would then in turn go back to Europe (Sutherland). The premier entrepot was, unsurprisingly, once again Makassar, which served as a kind of watershed draining the far flung collecting zones of the eastern Archipelago. In the first decades of the 17th century, as Makassar rose to power, European, Malay, Arab, Javanese, and Chinese traders set up shop in Makassar both to access spices as well as other products, especially turtle shell (Sutherland 2011; Reid 1983).

However, despite their designs on turtle shell as an important chain in their trading schemes, the Dutch never managed to acquire very much—not least because Chinese merchants in Makassar quickly cornered the market. Acquiring sufficient quantities of sea turtle to trade was a difficult task since it was a dispersed and opportunistic venture; turtles were caught one at a time, their shells stockpiled by petty traders—often Bugis—around Eastern Indonesia until a buyer would come along. The travelling traders were themselves often indebted to a Chinese patron in Makassar who would supply the capital in the form of credit to a trader in exchange for the right to purchase the goods at a set price—guaranteeing control over the supply. Yet this was a trickle supply chain that relied on tiny capillaries for accumulation. The Dutch had no patience or ability to make such arrangements, and thus missed out on the tortoiseshell trade for nearly two hundred years.

The tortoiseshell supply chain included three steps: first, Bajo fishermen and others would hunt and gather the shells, then sell them to local Bugis merchants, and third, selling them to travelling traders who would take them back to Makassar where they were finally sold to a local Chinese merchant—the one who had financed the expedition. In other variations, Sulawesi fishermen would mount their own expeditions, and then Chinese merchants in Makassar would buy directly from them—outbidding the Europeans every time, since the Europeans were limited by their superiors in the prices they could offer. The

Chinese merchant would then sell it at immense profit. Sutherland notes that for Sulawesi fishermen who sold directly to the Chinese, the profits were often something like 700-1000%.

These supply networks from the 17th century were therefore already in place when the demand for another marine product—sea cucumber—skyrocketed in the first decades of the 18th century. Although volume was much greater, tripang collection relied on many of the same trading arrangements as were used to collect sea turtle. Every year dozens or up to a hundred vessels would leave Makassar, Bone, and other parts of Sulawesi with the monsoons, some with empty ships to collect sea cucumber themselves, and others packed with trade goods which they would use to purchase tripang from those who had already collected it—along the same supply networks that supplied sea turtle shell (Sutherland 2004). While most of the Makassar fleet sailed to Australia, the demand also drove commercial growth to eastern Sulawesi where Bajo fishermen collected the abundant tripang and then sold it to Bugis aggregators who then passed it on to travelling merchants to bring back to Makassar. Such patterns were likely in place in Southeast Sulawesi for nearly a century before Arung Bakung arrived in Kendari.

On Sulawesi's east coast, the work was done primarily by Sama-Bajo communities living on the water, who would travel with the monsoons to favorable collecting sites across eastern Indonesia—sailing as far as Australia. The tripang were boiled, salted, and dried to preserve them after collection, and then fishermen would either travel to a nearby market to sell them, or more commonly, traders and middlemen would travel from cities, especially Makassar, to remote ports and islands to purchase tripang which local fishermen had been slowly accumulating. These traders would then travel back to Makassar, where they were able to aggregate large enough quantities to ship for export.

Indeed, the waters around Kendari were part of seasonal Bajo sea cucumber collection voyages. Bajo would have come to Kendari to collect sea cucumber during what

today is called “Musim barat,” or the west monsoon, starting in the inter-monsoon period of October all the way until February or April, when east Sulawesi was on the sheltered side of the monsoon. The alternate monsoon, the east monsoon or “musim timor” is also called “musim ombak,” or “wave season,” because the east coast is unsheltered from the strong southeastern winds. Velthoen (2002: 206) notes that this season migration moved from Tomini to Salabangka (Labengke area) and Kendari Bay.

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As discussed above, eastern Sulawesi’s empty coasts were punctuated by heavily fortified hilltop settlements which were themselves centers from which raiding might emanate—Banggai, Tobungku, Baubau, Kulisusu, Tiworo—and where the shadow of violence provided a cover for commerce. These polities became meeting places where Bugis traders, Chinese merchants, Bajo sea collectors, Tolaki and other indigenous forest collectors could meet to swap their wares. These settlements were sometimes ancient—like the kingdoms of Banggai, Tobungku, or Buton—and sometimes they were ephemeral, coming into being like a swarm around a figure of power before vanishing.

Kendari emerged as a such meeting place for the itinerant, a recurring and ephemeral outpost which came and went for a century before the Dutch tried to nail it into place. In its earliest iterations, it was merely a meeting place where dreams of riches were hatched by shifting alliances between Tolaki, Dutch, Bugis, Bajo, and Tobungku / Tobelo. Under the protection of pirate hegemony, the sea could be spun into gold. At least, that’s what they thought—and it did work for a few years before ending in tragedy. It turns out that while alliances with powerful pirates will protect you from the sea, they can’t do much about headhunting raids from the hills, or the scourge of smallpox sweeping in on the winds.

Around 1822, a Tolaki chief named Tebau, head of the Konawe kingdom based around Kendari, invited a Bugis noble named Arung Bakung to settle at the Kendari Bay

and open a trading post. Arung Bakung is a mysterious figure—he seems to have fled the Sultanate of Bone after a conflict with the ruler, and later became enmeshed in webs of conflict involving several different kingdoms, the Dutch empire, and roving bands of pirates. [73] Indeed, the invitation came at a moment when he was on the run—to settle in Kendari Bay and help them trade forest and ocean products to outside markets. And as a Bugis noble with a reputation for making friends with pirates and mercenaries, Arung Bakung offered not just market access, but protection. He agreed, moving there in 1823, bringing a contingent of Bajo sea collectors with him. With the protection of his pirate allies, the skilled labor of Bajo sea-cucumber collectors, the forest products and agricultural production of Tolaki farmers, and the prestigious trading connections of Arung Bakung, the settlement flourished.

Arung Bakung's identity as a member of the Bone nobility mattered greatly in this story. For many groups in Southeast Sulawesi, associations with the Bone aristocracy was a symbol of potent and esoteric power and prestige. Indeed, many lesser Bugis nobles played up this identity, often mobilizing it to gather followers through even glancing connections to the Bone throne. Even better was the marriage of local and foreign elements, and many of the region's most striking historical figures actively combined multiple lineages: Tebau was himself descended from a Bugis chief, Madukalla, who had become a king among the Tolaki generations before; Tebau brought together the foreign element of Bugis royal power with Tolaki indigeneity. Meanwhile, Arung Bakung married a Bajo princess of Tiworo, and their marriage combined elements of the Bone and Bajo nobility, courting influence with Sama sea gatherers.[74] In this way all of the important groups in the region were represented in this political leadership: Bugs traders, Bajo sea collectors, and Tolaki forest product collectors and cultivators.

The settlement in Kendari did extraordinarily well, attracting Bajo from around the area who were seeking protection from raids, as well as other coastal communities who

brought goods to the market there. The settlement benefitted from a war in Bone in 1824/25, which displaced many Bajo people from Bajoe, and who resettled in Kendari. Bugis, Makassar, and Chinese traders came to purchase the commodities. Money flows for a few years—business is good. But then in 1830, Arung Bakung suddenly left the Kendari settlement under mysterious circumstances, and without his protection, the Bajo sea collectors also leave—trade slows to a crawl.

In 1831, the year after Arung Bakung's departure, and by sheer luck, a minor Dutch official named Jan Nicholas Vosmaer arrived to the Kendari Bay. Vosmaer had spent several years sailing around Sulawesi, looking for a spot in which to establish his own trading post. In Kendari he met Tebau, who told him the tragic saga of the departure of Arung Bakung, and petitions Vosmaer to help him re-open the settlement. Vosmaer, having seen the booming tripang trade happening up the coast in Tobungku, agreed. Vosmaer takes his job of emulating the figure of power that was Arung Bakung very seriously; but instead of an emblem of the powerful Bone Kingdom, little Vosmaer plays up his role as an agent of the far greater Dutch Empire. He even decides to explicitly emulate Arung Bakung's strategy of partnering with pirates as a strategy of protection.

Vosmaer published an account of his arrival in Kendari, which among other goals, was clearly meant as an advertisement for his new settlement and its lucrative potential for daring traders. Vosmaer wrote at length about both sea turtle and tripang in Kendari—noting the different kinds available, how they are collected, processed, sorted, and sold. He noted that the Bajo informants explaining all this to him possessed detailed knowledge of the Chinese market—for instance, able to distinguish subtle differences in color patterns of sea turtle shells that were more or less desirable for the Chinese market, that he himself could not even see. His interest in sea cucumber is even greater; corresponding to the size of the market opportunity, and Vosmaer filled his report with page after page of descriptions of the different types. He wrote at length about the various methods of

collecting sea cucumbers, including gleaning at low tide, spearfishing at night by the light of a fire, or the use of the "tripang ladung," a basic trawl or rake made up of a heavy metal bar lined with hooks that is lowered by a rope and dragged across the seafloor to spear sea cucumbers, before it is pulled up again. However, his romantic admiration for the diving skill of the Bajo is unmistakable: "There remains now only one way, and that is the most dangerous of all, namely to wrest the animal, by means of diving, from the depths of the sea" (Vosmaer 1835: 153).

Vosmaer came up with a plan: he would convince the Tobelo raiders to settle in the Kendari bay and give up raiding, to become honest seamen and traders—but who could also provide protection. What could be more logical? This would not only provide protection for the fledgling settlement, but would solve the problem of raids on the surrounding areas. This scheme was not totally unique: the Dutch had been struggling for a century to stem the tide of raiding which threatened their control over eastern Indonesia—a campaign that was raging at the time of Vosmaer's arrival. Alternatives, such as persuading raiders to become farmers, had been tried before (unsuccessfully). Around 1835 Vosmaer had met with Tobelo chiefs, and then notified the Dutch government that 80 Tobelo ships would settle in Kendari.

The Sultan of Buton was furious, as he had been with Arung Bakung, seeing this as a direct continuation of Arung Bakung's project and an infringement on his territory—and the Sultan does not like that there are powerful raiding groups settling in his sphere of influence but not under his control. The Sultan put a bounty of 100 slaves on Vosmaer's head, and even tried to persuade two of the Tobelo chiefs allied with Vosmaer to betray him and attack the settlement. He went so far as to give permission to Tobelo raiders to settle in Kulisusu (which they had attacked just a decade earlier), but only on the condition that they would attack Vosmaer's settlement. But the Sultan also did not want to threaten the

lucrative tripang production of the Bajo fisherfolk, so they tipped off the Bajo in advance, who in turn tipped off Vosmaer.

Then, in 1836 Vosmaer died of a fever on his own boat. The Dutch, however, had become convinced of the utility of the Kendari Bay settlement, both as a way to tap into the lucrative sea cucumber trade, as well as a way to create an outpost of Dutch authority along a dangerous coastline. The next decades of the Kendari settlement are characterized by chaos and violence of uncertain origin; free-wheeling raiders and mercenaries roamed the seas, making temporary alliances, while headhunting parties attacked from land. The threads are difficult to follow, and in most records the raiding groups are so poorly identified that we can't tell if they are the same groups of people, or merely people of the same ethnicity—Tobelo—for example.

In 1840, an epidemic of smallpox wiped out much of the Kendari settlement, and the survivors fled to the interior, away from the coast. Once it was empty, another group of Tobelo raiders moved in to take advantage of the newly empty coasts, settling and building houses from which they could launch raids. In a strange twist that emblemizes the shifting alliances of this era, Vosmaer's successor and underling, a man named Cornelius, becomes friends with the Sultan of Buton, and together they attack and destroy these Tobelo settlers, beheading their chiefs in Buton. As Velthoen (2002: 250)writes, "if these were the very same raiders whom the Sultan had earlier encouraged to raid Kendari Bay, they were not shown any mercy in the presence of a Dutch government official."

Just a few years later, another Bugs noble from Bone arrived in Kendari and established yet another settlement in the same place. A Bugis syabandar or harbormaster began collecting taxes on behalf of the Sultan of Bone; and the Dutch established a small contingent and a military outpost there. Dutch steamships began to regularly patrol the waters of Eastern Sulawesi, interrupting the networks of raiding and piracy. Then in 1880 the Dutch governor of Makassar travelled to Kendari to sign a treaty with Sao-Sao, a

descendent of Arung Bakung, recognizing his suzerainty over the Konawe kingdom and Kendari settlement as a Dutch protectorate. In 1883 a regular direct steamship line was established between Kendari and Makassar, further bringing the outpost under Dutch control. Christian missionaries soon followed, and the booming demand for copra, rattan, wax, and damar at the end of the 19th century turned the region's forested mountains into a new frontier for forest products, bringing radical changes to regional political economy and supply networks.

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By the end of the 19th century, Kendari had become a permanent, if minor, Dutch military outpost, and an important, reliable source of valuable forest and marine products, as well as agricultural products, as well as a strategic location for Dutch steamships to operate out of in protecting merchant ships from pirates. Instead of a contested frontier at the limits of competing indigenous states and polities, Kendari assumed an "equally ambiguous position at the periphery of a colonial state" (Velthoen 2002: 330). By 1911, the Dutch established a police force in Kendari (that apparently consisted of 5 officers).[75] In 1913 Treffers wrote that the attempt to survey the population suggested around 13,000 "workable men," though he noted this could be an undercount; he also mentioned that people had only recently begun to gather in villages at the insistence of the colonial government—another sign of forced relocations. He also notes that at this time on a small number of Bugis settlements near Kendari were doing any kind of fishing at all (though he obviously is excluding the Bajo communities, so perhaps cannot be trusted to tell who from who). By the November 1920 census reported that there were about 70,000 Indonesians living in the immediate area of Kendari, as well as 151 Chinese people (114 men and 37 women), 25 Arab people (17 men and 8 women), and just 14 Europeans (11 men and 3 women).[76]

For Kendari, among the countless changes that came in the late 19th and early 20th centuries with the violently won "Pax Nederlandica" and subsequent direct colonial rule was a transformation in the role of the coast from a place of danger to a place of opportunity and refuge. You can begin to see the effects in successions of colonial maps which account for new villages being settled in the decades that followed.

An 1885 map which otherwise shows coastal settlements around the region shows no settlements for the peninsula, nor for all of Wawonii; this was exactly at the time that the colonial government had established a regular direct steamer ship service between Makassar and Kendari. Like Treffer's 1913 map, a map from 1909 shows no settlements on the peninsula at all, even as it names small settlements elsewhere inland and on other coasts. A 1924 colonial map includes no mention of a settlement at Nambowatu; it does include the name of a village that I have never heard of nearby—this could be an impossibly garbled name for one of Nambowatu's sister villages, though if so, it is in the wrong location—so was either mis-drawn, or the village has moved. Or it could be an entirely different village that no longer exists. The map does include the well-known village of Labuan Beropa (impossible to miss because of the high ship traffic that passes by it—which would have included all those government steam ships). An even more detailed 1939 map shows the same—just the two settlements, but none in the place of Nambowatu. This suggests that settlement of the peninsula began sometime between 1913 and 1924—though Nambowatu's story had yet to begin.

1957: The Time of the Gangs

It's difficult to overstate the violence and trauma of the period that began in the 1940s at the end of colonial rule to World War II to the national revolution to widespread guerilla rebellions to a military coup and mass slaughter of leftists, all of which took place within a span of 23 years. The period after the revolution in particular, when armed rebels opposed

to the unitary republican state controlled much of Sulawesi—a time remembered widely as the “time of the gangs,” or “zaman gerombolan.”

"Gerombolan," as a label referring to the rebel groups, is a difficult word to translate. For consistency, I follow previous scholars who have rendered this word in English as "gangs" (e.g. Harvey 1974; Gaynor 2016; Aragon 2001). It is a collective noun, but can apply to both humans and animals, and most commonly carries connotations of an unruly group: a swarm, a horde, a flock, a roving band, unsettled and unsettling. This choice of word is also political: "gerombolan" is a label applied by the national republican winners of the story to its rebel opponents—and it sought to paint the rebel movement as senseless, unorganized, incoherent, and barbaric—simply violent for violence's own sake. Indeed, this is how this period of time is remembered—though as we saw Armin’s story at the beginning of this chapter (“Those gangs…all those gangs… who were they?”) many people couldn’t tell the republican forces from the rebels. As far as they were concerned, they were all part of the same chaotic situation—just the latest in a long line of roving hordes of men with guns and uncertain motives.

There is abundant evidence that the conflicts in Southeast Sulawesi drove a huge wave of migration both internally within Southeast Sulawesi, and externally, as Southeast Sulawesi residents fled the political chaos to settle in other regions. It is difficult to estimate the total number of people displaced without access to more detailed and comprehensive archival materials, but the numbers were easily in the tens of thousands of people displaced, perhaps many more, as evidenced by oral histories, official records, and contemporaneous news reports.

In Sulawesi “the time of the gangs” is synonymous with the rebellion led by Abdul Kahar Muzakkar, another Bugis nobleman, this time from the ancient Kingdom of Luwu; he is often remembered simply as “Kahar.” Kahar was once an ardent nationalist who won accolades for his bravery fighting the Dutch in the revolution, at one point even serving as

personal bodyguard to the soon-to-be president Sukarno. However in the aftermath of the revolution, he would come to be the leader of the Sulawesi branch of the Darul Islam movement and its "Indonesian Islamic Army," which stood opposed to the Javanese centric, nationalist, republican state that took over from the Dutch. At the peak of the rebellion in the mid-1950s, Kahar's forces controlled almost all of the territory of Southern Sulawesi, aside from government strongholds in a few cities.

Kahar's rebellion is documented by Barbara Harvey's detailed study (1974), which paints a complicated picture of the rebellion. Although the movement is often remembered as one of Islamic fundamentalism, Kahar's original motivations were much more complicated than this. The rebellion was a seamless continuation of the violence of the revolution; the rebels were not satisfied with their place in the new republic, not satisfied that their contributions to the revolution had been adequately appreciated and realized, and unhappy that top spots in the new government and military stationed in Sulawesi had gone not to Sulawesi natives like Kahar, but to Javanese outsiders appointed from Jakarta.

Kahar's political and ideological orientations were more than anti-colonial; in his youth he became involved in the Islamic reform ideas of the Muhammadiyah movement, including a commitment to egalitarianism under the banner of Islam. Indeed, he was exiled from Luwu in his youth for advocating the abolishment of the Bugis aristocracy, which is how he ended up in Java fighting the revolution. But anticolonial egalitarianism was not a sufficient justification for rebellion, since both sides claimed to be about the people's revolution against the Dutch. Kahar apparently considered both Marxism and Islam as ideological banners and justifications for his rebellion and received invitations by both sides to join their respective movements. Kahar decided against aligning with Marxism, which Harvey argues may have been because of the continued popularity of the aristocracy in South Sulawesi; Kahar couldn't risk further alienating the aristocrats or their subjects. So, he decided on joining the ongoing and unrelated Darul Islam rebellion happening in West

Java. Harvey (1974: 255) writes: Islam with its egalitarian principles could be used in an indirect attack on feudalism.

Harvey notes that rather than anger at the aristocracy, it was the expected influx of Javanese transmigrant farmers to the area that prompted local outrage—outrage which the rebels capitalized on by attacking transmigration camps, especially at Konda. Indeed, Harvey notes that the conflict took on a racial or ethnic motif, opposing indigenous Sulawesi people against what they saw as Javanese invasion and Javanese hegemony over the state—both transmigrants and the military:

> Qahhar did not call the troops he was fighting the TNI—a name which still bore sympathetic memories of the national revolution--but the Tentara Djawa Komunis (TDK—Communist Javanese Army). The continued presence, indeed the expansion of numbers, of the Javanese troops kept alive the feelings of revenge which fired the rebellion. The use of "communist" as an epithet both helped to emphasize the distinction between the devout Muslims of South Sulawesi and the abangan Javanese, and to remind the aristocracy of the threat to their positions should the "communists" ever gain complete control. (Harvey 1974: 262)

Within a few years the movement had taken over much of South Sulawesi, and had expanded into Southeast Sulawesi. 1957 was a particularly violent year in Southeast Sulawesi. In October, thousands of rebels attacked a government special forces outpost in Kasepute, on the Bombana Coast on the Strait of Tiworo, an assault that lasted 10 days and displaced thousands of people who fled to Kendari and elsewhere. While they came close to nearly taking the city, they were repelled by government forces who deployed bombs and heavy artillery. The rebels retreated once again to the mountains, where they regrouped, and in December they launched a second attack, this time in a scorched earth campaign burning village after village as they followed retreating government forces towards Kendari. The campaign displaced an estimated 40,000 people to refugee camps in Kendari, and at the time officials feared Kendari itself would fall to the rebels before reinforcements would be able to arrive (Marhaen, 14 Dec. 1957).[77]

The 40,000 figure above is an interesting and curious one; the number is ideologically significant in Sulawesi—it is the number of people allegedly murdered by the Dutch commander Captain "Turk" Westerling during the revolution—and so a figure that is invoked in a revolutionary context of justice and revenge (See Kahin 1952 for more). As Gaynor (2016) notes, one of the rebel divisions was called "Division 40,000," which operated in the Southwest Peninsula, around Makassar. The other Division was called the "Hassanuddin Division" named for the 17th century Sultan of Makassar who opposed Dutch monopoly, and it operated in Southeast Sulawesi, at its peak controlling almost the entire countryside outside of the cities of Kendari, Kolaka, Baubau, and Raha.

The Hassanuddin Division had four regiments, one of which was led by Jufri Tambora; Tambora's regiment had 5 battalions that covered much of the southern part of Southeast Sulawesi, from Kendari to Bombana; Andi Bachtiar led one of the battalions under Tambora; Jennifer Gaynor (2016) directly interviewed both men, who were originally sentenced to death for their roles, but the sentences were never carried out. The newspaper report above names these two men as responsible for the burning of the villages en route to Kendari—and allegedly displacing "40,000" people—perhaps a republican reporter's attempt to undercut the revolutionary credentials of the rebels.

In his interview with Gaynor, Tambora rejected the label of "gerombolan" as applied to DI-TII which he saw as propaganda intended to undercut the movement's political legitimacy; gangs were unorganized, while DI-TII had all the structure and hierarchy or a state, a military (Gaynor 2016: 187). But as Gaynor writes, Jufri was upfront about his use of terror and violence, saying to her: "If you want to try to reject my orders, want to go against me, I'm the one with the guns. Look at all these guns. They could choose: do they want to live, or want to die. If you want to live, join me. If you want to die, then fight me. Mmmf, I kill you." (Quoted in Gaynor 2016: 187-188).

Unlike the clarity of the conflict in World War II and the subsequent revolution, where the sides were clear and well defined, the period of the gerombolan is defined by uncertainty, conflicting stories, and epistemic murk. In addition to the republican TNI and the DI-TII, there were countless other armed groups that flourished in the quagmire. As Harvey (1974: 268) writes, "There were many wild gangs who roamed the countryside, and if they were not TNI members they were labeled DI." These gangs included a number of splinter groups who had broken off from the DI-TII forces, staging their own fractalized mini-rebellions. All sides operated through violence and terror.

People were faced with impossible choices, often asked to distinguish between allegiances to equally irrelevant distant powers that had never offered them any kind of benefit or protection—only violence. There were only bad choices available: if you joined the rebels, then you went against the power of the national revolutionary state. If you went against the rebels, then they would kill you. If you wanted to stay to protect your home and land, you could perhaps try to play both sides, or appease them both, as was a common strategy for Sama people as Gaynor (2016) reports[78]. Or you could abandon your home and run. As Harvey writes:

> "It is often said that if the people didn't help the TNI in the daytime, they were punished immediately; if they did, they suffered that night at the hands of the DI. Conversely, if they refused to help the DI at night, their homes were burned; if they did help the DI, they would be branded rebels by the TNI, and thrown into jail. Faced with such unattractive choices, it is said that many chose the time-honored method of escape—migration." (Harvey 1974: 268)

There is extensive evidence that many did choose this option, as demonstrated in a flourishing of recent scholarship on the afterlives of this conflict. Drawing on local oral histories, Waldiansyah and Basri (2020) describe the occupation of one area, around Abuki district, beginning in April 1956. The rebels occupied the village because of its remote location and the abundant food found in village fields. Those who lived through the period recalled a time of deprivation and scarcity, with the rebels confiscating 80% of their rice

harvest, leaving them only just enough to stay alive. Locals had a difficult choice to make amidst the political chaos and uncertainty. Some stayed, threatened with violence, or not wanting to lose their farms and homes (perhaps there were even a few true believers). Others fled into the wilderness to live in remote camps for the duration. Others fled to government-controlled areas, becoming refugees.

Marwina and Hasan (2018) similarly describe a community of Muna people who ran away to Banggai to settle on the coast after being displaced by the violence. From an agricultural life, many turned to fishing. Gaynor (2016) also mentions the dispersal of Sama people to more remote Sama settlements away from the centers of conflict.

Kathleen Robinson (1986) likewise details the life of a village that had been occupied by the rebels and became territory of conflict. After a fierce battle between government forces and the rebels, "the village was showered with pamphlets from a government aeroplane, which advised them 'if you wish to stay alive, go to Malili.' They were very frightened, but preferred to evacuate with the rebels rather than flee to the safety of the [government controlled] town. Following their departure, the village was burned to the ground by rebel troops" (Robinson 1986: 85). The rebels forced the villagers far into the wilderness, away from any roads so that they couldn't provide shelter or food to the government armies. Robinson's informants described how they had to build the whole village under tree cover so as to not be visible from the air—a period they referred to as "living in the jungle." Since they were living in rebel territory, they were targeted by government forces.

Rabani et al. 2020 even argue that the mass displacements of refugees to the province's main urban centers of Baubau and Kendari directly shaped the futures of those cities, swelling their populations and driving new waves of infrastructure building. They quote a November 1955 communique from the head of the Kendari regional government requesting aid from the central government to help cover the costs of housing and

resettling thousands of refugees displaced to Kendari by the violence that year—while also referencing even larger scale evacuations that had taken place in 1952 and 1953. These large number of refugees had required them to expand city infrastructure very rapidly.

Importantly, the rebel strongholds were almost all in the jungle and mountains, while the little territory that was controlled by the government were a few coastal cities and the coastal roads that connected them; thus the coasts were among the safest places to be. Indeed, as Harvey wrote: "the seas still beckoned to those unwilling to eke out an existence as a subsistence farmer, and migration remained an acceptable escape for those who found the constraints of a traditional 'feudal' society unbearable." So while coastal settlement had begun decades earlier, following the "Pax Nederlandica" established by the violence of fleets of Dutch steamships loaded with big guns, in this period many new waves of migrants fled to the sea in search of a better life.

Conclusion: On the Run

When I began researching this chapter, I was merely trying to make sense of the history of the Kendari area and its long legacy of being treated as a frontier for marine product collection. I was struck by the patterned ways that the lines of commerce and violence had been blurred across time, and even more struck by allusions that the coasts here were long considered "empty," a description that contrasts strongly with the present, where the coasts are densely populated. I found that processes of violence and commerce had once emptied the coasts—and it was processes of violence and commerce that filled them up again.

So it was something of a surprise to realize that these questions of displacement of people and the structural forces driving coastal settlement patterns turn out to be incredibly significant for fisheries science. My understanding changed after a meeting with fisheries scientist Daniel Pauly in 2019. I was familiar with his well-known ideas such as "fishing down the food web" and "shifting baselines syndrome." But seeing that I was an

anthropologist, he took the opportunity to ask me my thoughts on what he called his "erstwhile foray into the social sciences," trying to understand why, beginning around the 1970s and 80s, the number of small-scale fishers in places like the Philippines and Indonesia had been growing so rapidly, and why the growth showed no signs of slowing down. Where were all these new fishers coming from?

This was not a story of "population growth." Instead, these were fishers who were migrating to the coast. Pauly proposed a way to understand the rapid growth of the numbers of coastal settlers and small-scale fishers as driven by structural forms of displacement that pushed people from the interior to the coasts. Fisheries were seen by states, development organizations, and by displaced people themselves as a solution; the sea could simply absorb these people. Perhaps they were once farmers displaced by a plantation: no matter. They would become fishers.

This idea has remained marginal, totally ignored by social scientists, in part because it was advanced as part of a "model" to which Pauly gave the unfortunate name "Malthusian Overfishing," a name he would come to regret. Indeed, despite the helpfulness of the core premise—that displaced people with no alternative often become fishers— there are many problems with the elaboration of this "model," including its invocation of Malthus and its universalizing aspirations.[79] Indeed, why call this "Malthusian" at all? Pauly originally justified the choice because of Malthus' central conjecture that food supplies can only increase arithmetically, and therefore cannot keep up with geometric population growth—in this case, with population increase coming not from human reproduction, but from migration via displacement. But while Malthus's predictions have so far not been the outcome for agricultural food production (indeed we are awash in an immense global surplus of food that is nevertheless concentrated in few hands), Pauly suggests that it *is* true for wild-capture fisheries which he argues do have the kind of "hard limits" that Malthus predicted for all food production. Even if human populations continue to grow

indefinitely (not an unchallenged assumption; see Adam 2021), fisheries yields will not. Exploitation of a given fishery "can generate in the long term *at best* a *steady* yield, or a yield oscillating more or less strongly around some mean value" (Pauly 1990: 3), and more likely, if fisheries are not regulated adequately, a declining yield.

But as Pauly reminds us, it is critical to note that the "squeeze" on fisheries came not simply from a growing number of displaced people turning to coastal fishing to survive, but from the simultaneous explosion of industrial fishing that began at precisely the same time—in the 1970s, 80s, and 90s. It was this inflorescence of industrialized fishing that reduced the capacity of the sea to "absorb" the labor of displaced people.

And in subsequent developments of the idea, Pauly (1997) also makes a helpful conjecture: that what is represented by the specter of "population growth" is more properly understood as *demand*—and he notes correctly that "demand" can grow rapidly even without population growth, as individual consumption rates increase. This fact is best emblemized in the disparate rates of both consumption and waste generated by wealthy people in the global north. This corrective idea helps us to see that the driver of so-called "Malthusian overfishing" is not a growing number of Indonesian fishers doing their best to get by, but the global increase in demand for wild-caught fish for elite consumption and industrial use (cf. Probyn 2016).

There's an irony here as well, that in Indonesia at least, Malthusian thought influenced the very elaboration of the policies which helped lead to mass movements of people—during the colonial, Japanese occupation, and post-colonial eras, when groups of human beings were seen as mere "surplus population," mere productive assets to be moved around by the state at will.[80] Indeed, one could argue that the model is "Malthusian" because of the ways that Malthusian inspired ways of thinking about human populations and their "management" helped to create the very structural conditions that generate overfishing—of which displaced migrant fishers are just one part. We could even argue that

given the focus on the ways that industrialization displaces people from land-based ways of living, Pauly's model actually corresponds much better to a Marxian analysis than a Malthusian one, more primitive accumulation than population bomb. As Tania Li has argued, Marx developed his idea of "relative surplus population" in order to "highlight the continuous tendency of capital to concentrate labour's productive capacity into labour-displacing technologies" (Li 2010: 28).

Consider what Pauly rightly offers as one of the main drivers of migration—agricultural change, including the concentration of land in fewer hands and the increasing efficiencies of green-revolution technology that led to decreases in labor requirements—changes most potently illustrated in the figure of the plantation as it developed in 19th and 20th century Southeast Asia (Li 2011; Li and Semedi 2021). Where a traditional smallholder agricultural system required something like 1 laborer per hectare under cultivation, the plantations that have stolen their land and replaced them require exponentially less labor (Li 2011); the former smallholders are rendered landless—becoming "surplus."

Plus, as Tania Li and Pujo Semedi (2021) have shown, the hiring practices of such corporations as plantations and mines often operate on racist terms of replacement or substitution—replacing the local people with outsiders—a practice based on colonial ideas of the qualities of laborers, what Al Atas (1977) famously called "the myth of the lazy native." Al Atas does not make the connection directly in his text, but it is impossible to miss the influence of Malthus on the colonial discourses and practices he analyzes, given their obsession with the immoral "sloth" of the local people who can only be goaded to work by fear of starvation or by threat of violence. Those people whose land was stolen and who are not hired by the plantation, mine, or other "corporate occupier" (Li and Semedi 2021) must figure out some other way to make a living—or to move, perhaps to the coast.

This kind of corporate displacement doesn't yet account for the overt forms of violence that also have driven patterns of movement as people relocate to seek safety, such as discussed in this chapter. All of these people are forced to move. With no land, little cash or capital, and perhaps with little social or communal support, and faced with a slate of inopportune choices—demeaning wage labor with little security being the main one—many chose an alternative: to settle on the coast and take up fishing or marine product collecting. Fishing requires almost nothing to get started, and what you can't sell, you can eat. A life at sea was certainly not everyone's dream. But for countless people in search of safety or a better life, it was a choice worth making.

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And so, we return to the beginning, to Armin telling me how his grandmother founded Nambowatu: "Run! Run! And then you make a village there." Nobody who told me about this period spoke of sides. They weren't fleeing one particular group, but the entire situation. Nambowatu offered refuge, an escape. It was so out of the way, of such little strategic importance, that perhaps they would be safe there. Who could have predicted that their little village sat atop the most beautiful corals in the world and would one day be the center of its own globe-crossing commodity chain?

The story of the birth of Nambowatu, of fleeing from the inscrutable violence of the age of "gangs" evokes the period that came before it: of groups of roving pirates, traders, colonizers, slavers, and fortune seekers who plied the waters around Kendari. Indeed, as we've seen, the coasts of Eastern Sulawesi sat for centuries at the borders between competing claims of power, sovereignty, and suzerainty—a liminal status that offered opportunities for enterprising figures to navigate competing claims for their own purposes. Exiled Bugis princes fled here to found new dynasties or spin fortune out of their ethnic and royal reputations. Pirates and raiders exploited the gaps in authority to capture slaves and booty for the machines of global production, to exact revenge, or grow their own power.

Polities like Tobungku played all sides, and offered "free trade" outside of Dutch pretension to monopoly. Even the Dutch, in trying to establish their territorial control over the area, had to resort to techniques of re-directing and navigating competing claims of power, as shown the story of Vosmaer. Those who were brave or skilled enough, like Nenek Koda, might get in on the action, using their ilmu to dodge the violence aimed at them. Others simply hid—running to the hills, or perhaps laying a blanket of magical fog over the village to hide it from view.

INTERLUDE
The Hotel Aila

One day, while I was in Baubau on the island of Buton, south of Kendari, we went looking for a trace of history. Today Baubau is a marginal city in national terms; it lost its seat as provincial capital to Kendari in the 1960s. But its residents have never forgotten when Baubau was in the middle of everything—a great center among centers of power (Maula et al. 2011). Baubau is the site of an ancient kingdom, the Sultanate of Wolio—the Sultan who sent Tobelo raiders to Kendari to kill Vosmaer in the previous chapter. Wolio was a protectorate of Ternate, and Ternate was allied with the VOC in the Age of the Company, and so Baubau was an important locus of Dutch power in Sulawesi. Conveniently located along the shipping routes that connected Melaka and the spice islands of Maluku, Baubau was a frequent port of call for trading ships from all over to replenish water and provisions before crossing the Banda Sea. The evidence for this history is everywhere on land—not least in the shape of a massive 16th century fortress that overlooks the city—the largest fortress in Indonesia and depending on your definition of "fortress" and "largest," some passionate locals argue the entire world.[81]

These traces are also found in the sea, which is how I came to be on a boat with several of our friends, searching the seas for an anchor. My friend Jaspar was a local dive master and guide who worked with foreign researchers and adventurers; I got to know him during my dive master training. His family was from Wanci, in Wakatobi, but he grew up here in Baubau. Interested in the city's history and its material traces, in college he studied archaeology at UNHAS in Makassar. He's found historic silver coins hidden in limestone caves deep in the jungle. He's found an overgrown World War II airstrip long abandoned. He's even found bones and cave paintings which are likely among the oldest works of human art on earth; indeed, South and Southeast Sulawesi are home to many cave systems

with art that is more than twice as old as the famous Lascaux Cave paintings in France, 45-50,000 years of continuous and creative human habitation. But Jaspar's real interest is the sea. He tells me that the water here is full of treasures, evidence of what was once an important marine thoroughfare. He finds pottery sherds at one of our favorite dive sites—evidence of villagers from neighboring islands coming to the mainland for fresh water. But more importantly, and what we are here to see today, he wrote a thesis on anchors which had been left behind in Baubau's waters in the age of sail. I relied on Jaspar's expertise to help me bring the past into the present.

However to find the anchor, Jaspar relied on the expertise of local octopus hunters. Jaspar told me about when he was a student trying to find the anchor for the first time, having only heard about it from people in the city. He and four of his student friends had arrived from Makassar, and spent an entire day going back and forth in the water trying to find the anchor. They failed. On the second day, they got up the courage to ask one of the local fishermen who was hunting for octopus, motoring up to his small canoe. After telling them what he was looking for, the guy led him right to the spot immediately.

How did the man know? Jaspar explained: it is because nobody knows the sea floor like an octopus hunter. To catch an octopus, you sit in your canoe, mask on your face, and your face dipped into the water. You paddle along gently, slowly, and you scan the seafloor beneath you for life. If you do this for long enough in the same spots, you build up an incredibly detailed mental map of the seafloor and its topography—and something as out of place as a 15-foot-long anchor stands out as a landmark. Other fishermen who just fish, or use nets, do not have this same kind of knowledge. Octopus collection requires a different kind of visual practice and knowledge of the seascape.

Plus, the man was from Pulau Makassar, a small island near the Baubau harbor, whose name came from the soldiers that were imprisoned there in 1666—soldiers from Makassar sent in a great fleet to punish Buton for its allegiance with Arung Palakka, the

Bugis prince who helped the Dutch conquer Makassar (see chapter 5). [82] Over time, the residents of Pulau Makassar became devoted subjects of the Wolio Sultanate, and today they are recognized, perhaps ironically, as one of the last bastions of authentic Wolio language and culture. They are well known for their dedication to history and its truths, and they have their own stories about the anchor, which is located just offshore: they say that it is the anchor of their island, and if removed, the island will float away.

Sometimes history repeats itself, and that day we spent hours searching for the anchor. At one point my partner who was with us, inspired by Jaspar's story, clung to one of the boat's bamboo outriggers while we puttered along, face in the water, trying to spot a shape on the seafloor. No luck. In the distance we spotted a group of fishermen in small outrigger canoes searching for fish and octopus on the reef, and we sailed over to ask for their help. As we approached, Jaspar suddenly called out—it was the same man who had helped him find the anchor all those years before. He graciously obliged us. To give directions for something that you can't see underwater, you give what's called in English "a range," where you line up two objects in the distance, which gives you the line on which your desired object falls: lineup that minaret with that hilltop, and you will find the anchor. Within a few minutes, we found it.

We descended on the anchor—at least 5 meters long, resting in about 5 meters of water. The shape was classic "admiralty": imagine a stereotypical anchor tattoo and you're pretty close. Two curved tusks joined together at a long straight beam, with a large metal ring at the top where the rope or chain would be threaded. The anchor itself, was awash in life, colonized by all manner of marine creatures.

But Jaspar explains that the anchor is a bit of a puzzle. It is huge: about 15 feet long, or 5 meters. Such a size suggests a very large ship. But the shallow depth suggests that the boat to which the anchor belonged was not a large ship; how could a huge ship have sailed through these waters without getting stuck?

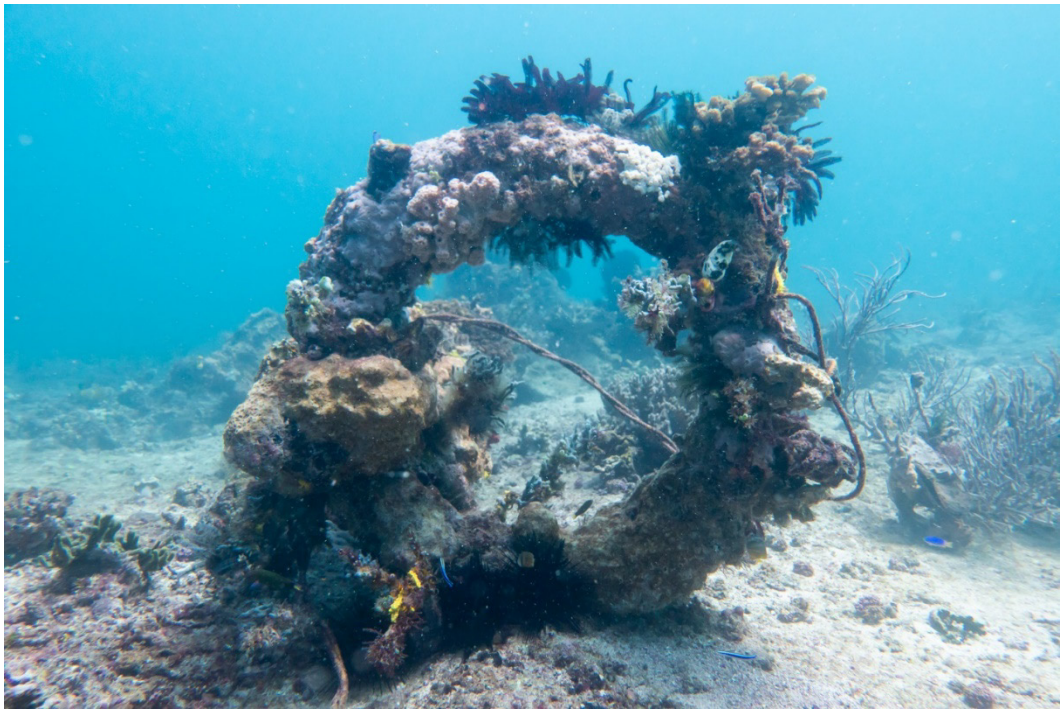

Figure 30 (top): The anchor from above | Figure 31 (bottom): The ring or “shackle” of the anchor

Later I do some digging. Jaspar and others have suggested it could be an anchor from a Portuguese Galleon; the Portuguese were in these waters in the 16th century; it was their influence that encouraged the Buton Sultanate to build the fortress. But the Galleon was a design popular across Europe; famous galleons such as Sir Francis Drake's *Golden Hind* had a draught of 13 feet when fully loaded—possible, but a tight squeeze.

What's clear is that the anchor was very old. The design was one in common use by Portuguese, Dutch, and English ships in the age of sale, but different from later innovations that happened in the 19th century. It could be as young as the late 18th century, around the age of Revolutions, or as old as the early 16th century, and the age of Portuguese explorers. We all grow quiet when we realize that the gap between today and the late 18th century is as wide or even wider as that between the late 18th century and the early 16th century.

I laid awake that night wondering about the circumstances in which this anchor was lost. Anchors are a key piece of safety equipment at sea, and so it was standard practice in the age of sail to carry several spare anchors (Parthesius 2010). If you needed to get away quickly, say, while under attack, you could simply cut your anchor loose rather than waste time pulling it up. Sometimes the crews, malnourished, weak, and shorthanded from months at sea, were simply too tired to haul in anchors. Indeed, it was VOC policy in the early days for its ships to carry at least 8 anchors at all times:

> In the many ships' journals of the period, the most commonly reported problem was the number of anchors. Operating in still unfamiliar waters, the ships often lost anchors due to a lack of good anchor rope or if they had to cut the ropes and were not able to later salvage them. In 1614, the Middelburg arrived in Asia with only one anchor left. It had lost nine anchors on its voyage from Europe (Parthesius 2010: 96).

But it is difficult to identify provenance; anchor design in the age of sail was cosmopolitan. It could have been a VOC ship, of course. VOC records distinguish between larger "ships" and smaller "yachts." Yachts were smaller cargo vessels able to adeptly

navigate the complex archipelagic waters; where the belly of a fully laden ship would sit as much as 20 feet below the water line, a yacht had a much more shallow drought—able to sail over the sandbanks and reefs that dotted the sea. Over time the more agile yacht became the main style of ship employed by the VOC, comprising the majority of its fleet in Asia (Parthesius 2010), the ship's design responding to the geography of trade.

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We surface from the dive and climb back aboard my favorite boat in Indonesia, the *Freedom*. A beautiful boat, both classically Indonesian and uniquely innovative. *Freedom* had a long, narrow body, with room for a few dozen people to sit on long parallel benches, with just enough room between them for someone to scoot by. Two huge outriggers on either side kept her stable in the water and meant that the boat didn't need a keel (the fin that sticks below water to keep the boat from rocking too much); she had a draught of only about a foot—so could glide right over even very shallow coral reefs.

Freedom was the pride and joy of her owner and our captain, Bapak Haron. It turns out that Bapak Haron, despite his fluency in Wolio, is not originally from Puma or even Buton. He was born in "Kupang," more specifically in a small village on the island of Rote, which he told us has become a very popular tourist destination, "almost the same as Bali," he says. He told us to look it up, it has become a popular surf destination: Nembrala. He still has coastal land there, he said, and fantasizes about cashing in.

Bapak Haron has lived in Baubau now for 27 years, arriving in 1991. He was born a Christian, and his family at home is all Christian, but he converted to Islam when he met his wife here in Buton. He goes back when he can. During the inter-monsoon period he would take *Freedom* (now 10 years old) all the way to Kupang from Baubau (about 400 miles), which takes only about 2 days, passing through the small islands on the east part of Flores. The scariest part is being surprised by the sounds of whales surfacing to breathe in the depth of nights, in the middle of the open ocean—a reminder that you are not alone.

As we were talking about anchors, he told us a story about a famous old anchor in Kupang, very similar to the one we had just seen—but sacred, keramat. It had been hauled out of the water by someone, he didn't know who, and packed and shipped to Jakarta where someone wanted to put it in a museum "or something." They unloaded it in Jakarta, but the next day, it had disappeared. Poof! Vanished. Nobody knows how but that anchor ended up back in the ocean, in Kupang, in exactly the same spot where it was before. "We know this story doesn't make sense, but it's true."[83] The anchor, rewinding its own clock, seems to have returned itself to a permanent state of suspended history.

These stories about Kupang and Rote got Bapak Haron going, and he began to spin stories of another kind. Back in the late 1990s and early 2000s there was a huge business in smuggling people across the border from Indonesia into Australia—refugees and asylum seekers fleeing violence in Afghanistan, Iran, and Yemen, and Somalia, and Iraq.[84] Residents of Rote were at the front and center because of their geographic location close to a special place: Ashmore Island, which was officially Australian territory. Baubau too, was a center of activity. Despite its former role as a powerful center, it was its contemporary status as an out-of-the-way backwater that made this possible; like Rote, there were no coastguard people here patrolling. Nobody would know.

Thousands of people would arrive in Baubau by boat or plane and then would enter the Hotel Aila, in the old part of town, and disappear forever. The hotel would get a call to let them know people were arriving in a few days, and they would clear out all their guests. Then people would arrive in the afternoon, and they would be gone that same night. They would tell anyone who asked that they were in Hoga—a popular tourism site in Wakatobi for diving, and one which is conveniently hard to reach. He said at one point there were 11 ships which moved 4,000 people from Baubau alone. They enlisted every passenger boat they could find, calling in boats from Wanci, from Kabaena, loading maybe 400 or 600 people per boat.

"Banyak uang. Banyak uang." A lot of money. A lot of money. They were given 700 million just for "uang tembak," ("shooting money" as in "shooting" a gun) per boat; this was not money to buy guns, but money to be given *to* the guns—to the cops, navy, coast guard, or whoever. If you got caught, you paid out the uang tembak, but if you didn't get caught, and made it safely to Ashmore, then you got to keep it all—a bonus for the crew, on top of the already enormous payout. "That's how the work was… a lot of money, but dangerous, high risk."

Bapak Haron was once almost involved himself. He was approached and told that if he made it safely to Australia, then he could keep all the uang tembak all to himself. "I thought about it, and I went." He worked it out like this: If I am captured in Australia, then the maximum sentence is 1 year and 8 months. So, if I'm in jail for 1 year and 8 months, but I get to keep the uang tembak—all 700 million, then that's ok.

But it didn't happen. The group he was supposed to take from Baubau was captured in Makassar and returned to Java, to Jogjakarta, which meant a change of plans. Bapak Haron would sail to Jogja to meet them and take the people not to Ashmore, but to Christmas Island—a much more dangerous route over the rough, open waters of the South Seas. But he didn't get very far before giving up. Three times he set out with his boat, and three times he had bad mechanical issues before passing a small rocky island south of Buton. First, an engine failure, and then a second failure, and then the third time, a broken rudder. He took this as a sign, and puttered home to Baubau.

Shortly after, there was a big story. A guy had been hired to replace Bapak Haron, a man from Sumatra. The boat picked the refugees up in the middle of the night, and then they set off in darkness. But the boat was overloaded with people, and the pilot didn't know these waters. Before long they struck a hidden reef, and seven passengers died in the wreckage. This was in the year 2000. "It made it onto the TV, which is how I found out." The one who got rich from this all was the Bupati at the time, and then mayor, who provided

cover and may have helped organize the voyages directly. But it was all too much for Bapak Haron. “Mafia… you have to be brave—so if you you’re not mentally strong, don’t do it. Because in this you have to face the state.”

Bapak Haron has cut the motor while we talk, and we float near a beautiful golden sand beach. He tells us that the guardian of this beach, its caretaker (not it’s owner) had died several years ago, and since then lots of people come here to mine sand for construction, “including me!” he admits, laughing. He will come and fish for a while and then on the way back take some sand. This beach used to be covered in coconut palms, lush and shady, but they are gone now since the guardian died and everyone started taking the sand. The trees dried up and fell over. Belonging and care, property and theft—all is blurred.

How strange the ways that history echoes, as people are moved around by war and empire. How care and memory and protection come and go. Floating by the beach, I think about the ways that the traces of history litter the landscape—but that their secrets are legible only to those who already know the story. And then there are the stories that leave no trace at all, like the people who arrive in the cover of darkness, checking in before disappearing through the back door of the Hotel Aila.

CHAPTER SIX
Bomb Fortunes

In June 2018, on Idul Fitri, the most important holy day for Indonesian Muslims, many of Nambowatu's families were out of work and broke. It had been some six weeks since the ministry of fisheries abruptly shuttered the live coral industry. For the dozens of families who relied directly and indirectly on the income earned by coral collecting, the closure couldn't have come at a worse time. Ramadan and Idul Fitri are, among many other things, important times of giving to one's community. On a day when you hope to donate generously to those in need and to hold a small feast to welcome friends and family into your home, many had only rice and few vegetables in their pots. That is, until late morning, when a rickety boat from a neighboring village puttered into the town's shallow bay, chasing a school of reef fish.

"PLUNK—BOOM" went the fertilizer bomb into the water, echoing across the village as hundreds of hand-sized fish were blasted off the reef. Within moments, a dozen small canoes were motoring across the bay to help scavenge every scrap from the sea floor, and to divide the fish among the families with nothing to eat. Folks in Nambowatu were used to exacting claims from outsiders who fished in their waters—one of the loose institutions of moral economy that govern resource access in the area. But on Idul Fitri, the bomb fish also became a kind of impromptu "zakat," a redistributive tithe given on the Eid through which Muslims share their blessings with those less fortunate. With the blast, the shame of having nothing to share, nothing to give, was washed away—and calls of excitement and laughter quickly spread across the village as the divers and their canoes came back to distribute the spoils. Grilling fires were lit, curries were whipped up, and relishes of salted sour mango and chile were readied. That afternoon the whole village ate bomb fish, and as one of my coral diving friends said later: "That bomb was our rejeki."

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Exploding bombs are everywhere along the shores of eastern Indonesia. For decades they have been a popular choice for producing a windfall of fish out of thin air. But how did the bomb come to Southeast Sulawesi and to the Bay of Moramo? The answer was not what I expected, and took me down strange rabbit holes chasing the ghosts of war that have remade the landscape.

This chapter explores how the fertilizer bomb has remade the work of fishing around the Kendari bay—reshaping both the political economy and physically transforming the reef. For communities across eastern Indonesia, these improvised explosives have become an ordinary feature of everyday life—a tool for generating windfall amidst the precipitous decline of marine fish stocks. Bombs operate as a kind of time machine, summoning forth memories of ocean abundance that have long since receded into the past. Indeed, people in Nambowatu and across coastal Southeast Sulawesi often split time into two parts, measured by fish. There is the present time of relative scarcity, where fish has become a luxury and is often treated as cash (as in, eating fish often feels foolish or wasteful when that fish could instead be sold), and "dulu" or "before," a time that roughly corresponds to the 1980s or early 90s, a time when fish were much more abundant, and everyone ate their fill. I heard over and over about how "before" you use to be able to just drop a fishing line into the small bay in front of the village and you would easily catch your dinner. Today not so. In this sense, the bomb operates as a kind of *memory* of times of abundance.

Indeed, the bomb makes perfect sense when considered in the context of decades of creeping intensity in fishing methods—where the growing effort indexes the gradual disappearance of abundant fish stocks and the corresponding rise in time and labor expended to catch what's left. Gone were the days of manually paddling a canoe to the waters just in front of the village and dropping a line. The gauges of nets grew smaller as

well, chasing the shrinking bodies of fish. The crabs had gotten both smaller and more elusive, so you now need many more traps to fill your pot—and the patience required to pick apart ever smaller shells for the dwindling scraps of meat. Like the diving compressor, the bomb is a technology for getting by in these times of less—able to generate windfall and fortune in the unlikeliest of places.

People in Nambowatu have an uneasy and ambivalent relationship with the bomb. Many people had fish bombers in the family—or had even once "played" with bombs themselves. Imran's brother in Wawonii, for example, was once a prolific bomb fisher, having lost his left hand many years ago in the process. Still, during my research bombing was rare in the waters immediately around Nambowatu, in large part because of the dozens of divers who lived there and who liked to gather coral there. Indeed, when I first arrived, and asked about the bombs (they were hard to ignore, after all) people assured me that in Nambowatu, bombing was not allowed, and any bomber would be shooed away for trespassing on village territory. As with most things, the truth was somewhat more complicated than this story which was told for the benefit of the foreign researcher. Bombing is imbricated in the same social networks that facilitate life in the bay of Moramo. You rely on those networks for your own wellbeing and livelihood, even if you don't agree with the methods used by some of its members. And so it is not so black and white as telling off the naughty bombers (cf. Ammarell 2014).[85]

Bomb fishing, like other forms of industrial and destructive fishing, is organized around surplus and windfall, and has a direct market orientation. While in some instances bombs are deployed for communal purposes—such as the Eid feast mentioned above—the fish are more often sold. The chemical reaction that causes the explosion can be read as a flash of commodification, a boom that quickly puts the fish into circulation. Still, even with this market orientation, communities are often able to successfully make claims on some

of the bomb fish, siphoning off a small portion of the surplus generated within their spheres of traditional control.

Bombing, in one sense then, is about labor—or more specifically, labor time. The bomb is a tool whose purpose is to reduce the amount of labor and time needed to collect a sizeable number of fish—an amount worth taking to market. A single well-placed bomb might gather as much fish in a few minutes as fishers using old fashioned methods would be able to gather in several days or even weeks. As fish disappear, bombs move from being clever labor-saving devices to being necessary tools of fish accumulation. These days, without a bomb or some other similarly destructive technology, it is increasingly difficult to gather enough fish to make it worth the time spent on the water—*especially* if the goal is to sell the fish at market (though it certainly also means fewer people fish for subsistence).

In a second sense, bombing can also help us think about economies of permission and access—that is, a loose institutional system in which people are able to make and exact claims. Consider the Idul Fitri bomb in Nambowatu; the moment it exploded, all of the divers in the village sprinted to their boats and cranked on the compressors. If someone was going to throw a bomb in their waters, they were at least going to make sure that their families were eating some of the fish. Similar claim making or rent extraction happens with many kinds of destructive fishing, where the crews will pull up to the village and distribute some of their catch as a gesture of goodwill and in hopes of securing the tacit permission of the villagers to continue fishing. In other circumstances the villagers will just take the fish themselves. In this sense the bombs find their place in local economies of access and permission; within local institutions, a niche is carved out to incorporate the bomb.

In a third sense, however, fish bombing can also teach us something about the organization of state power, a surprising inflection point where two opposing understandings of the state collide.

On the one hand, the bomb clearly situates us in the discursive terrain of the state as the body which monopolizes the use of violence. Indeed, why is bomb fishing the subject of such intense discourse when other even more destructive fishing practices are not? This has to do with the way that the bomb is not just an ecologically destructive fishing method, but also a spectacular breach of state prerogative. The bomb, like the prison, is part of the suite of technologies of violence that in the Weberian thesis belong exclusively to the state. Every fish bomb, then, is a kind of pilfering or drag show of the state's monopoly on violence. And yet the line is more blurry than just that—not least because fish bombing is often carried out under the auspices of state actors. In this heterogenous vision of the state, the monopoly over force is diffused and dispersed; anyone who operates even partially within the shadow of state power can have a go at legitimating their own violence.

However, the fish bomb and its material history also situate us somewhere more surprising: the discursive terrain of Foucauldian biopower. As an all-too predictable outcome of the Green Revolution and its material flows of nitrogen, the fish bomb is inextricably linked with efforts to increase human welfare through the disciplining tools of modern agriculture. As Kregg Hetherington (2020) argues, manufacturing a hyper-abundance of staple grains was among the most radical of technologies to "make live" employed by states in the 20th century (even if Foucault himself didn't notice). But what does it mean that the key material precursor to this potent tool of 20th century biopower—synthetic nitrogen—was itself a technology of war? And what does it mean that its enduring material legacies are replete with feral forms of violence like oceanic "dead zones" and fish bombs?

Indeed, the fish bomb summons forth histories of violence and invasion—the regular explosions mark a rhythmic legacy of war in the landscape. Imran, my host, friend, and main interlocutor, would jokingly call fish bombers "teroris ikan," or fish terrorists—directly naming the uneasy relationship between the bomb and the state. Yet this link

between blast fishing and militarized violence is more than superficial: its genealogy is tied directly to World War II and the growth of industrial empire in the 20th century, just as it is likewise inextricably bound to the forms of industrial agriculture that spread across the world following the conclusion of that war. The material histories of these forms of violence, industrialization, and empire echo across time—and lead you to unexpected places.

Bomb Physics

I will never forget my first underwater bomb. We were diving next to a village up the coast from Nambowatu. The water was shallow and clear, the light strong, illuminating the seafloor. I was freediving, drifting calmly maybe 10 meters below the surface when the roar ripped through me. I was sure that the bomb had exploded just over my head, and I instinctively bolted for the surface wild with fear. But when I surfaced, I saw nothing—only the lush greenness of the mountain behind me, the *Two Sons* floating sanguinely in the turquoise water, its compressor motor clanking. No bomb, nor even any other boat. The crew aboard the *Two Sons* laughed at my terror. The bomb, it turns out, was at least a kilometer away, perhaps more. Although I had learned in my dive training that sound travels faster underwater than through air—five times faster to be precise—this knowledge had not prepared me for the embodied experience of the soundwaves that rippled through the water during each dive.

Above the surface we're used to a more legible relationship between phenomena and their accompanying sounds: when lightning strikes you are not surprised when the thunder reaches you at a delay of several seconds. Even the horrific videos of the 2020 Beirut port explosion show how the event of the explosion is one of a syncopated coupling of the visual and the auditory. I keep going back to one video (shot coincidently from a dive boat in the water in front of the city) which captures the scene.[86] At the moment of explosion, the smoke from the inferno is suddenly enveloped in a perfect sphere of white

vapor, which is then sliced silently into a ring before radiating out at immense speed, riding the shockwaves of the fertilizer blast. Your eyes follow the ring in the video as it approaches the boat, and you anticipate the terrible boom that is to follow after 10 seconds of excruciating quiet.

But underwater, you cannot see the explosion—there is no lightning to warn you of the thunder. Travelling at 1500 meters per second, a bomb that is 1.5 kilometers away will sound as if it is just next to you, while on the surface, you may not hear anything if you are more than a few hundred meters away, the above water sound often carried away on the wind. Worse still, under water it is incredibly difficult to identify the direction from which sound comes. Above water, our bodies use the delay of sound to identify direction; if a sound reaches the left ear slightly before the right, you understand that sound is coming from that direction. But underwater, sound travels too quickly, reaching both ears nearly simultaneously. This is why it feels like the explosion has gone off right over your head.

After that first day, I can't remember a day at sea where I didn't hear at least one bomb—sometimes dozens of them. While I never *quite* got used to the explosions, I didn't always freak out like the first time. Bombs rarely came all alone, so once you were startled by the first, you could steel yourself for the successive explosions. They never seemed to phase my friends, however, who barely reacted to even the loudest explosions. While for months the sound still triggered a shock through my body, over time I became desensitized, the sounds blending into the background, a landscape of war.

Perhaps we can think about the staccato of the bomb underwater as a metronome marking a new form of time and a hearkening back to the violence of other times. The temporal regime is also one of discipline: consider the bell that hangs in front of the village school in Nambowatu, made from the shell of a World War II bomb. Students line up before the bomb for Monday assemblies in rows of military precision as they sing the national anthem while the flag is raised. On the one hand, the bomb is instantiated as a symbol of

state power at the threshold of the school—among the first and most common way that Indonesian people interact with the state. The bomb bell could be read as a performance of state power, as an atmospheric means of inculcating national values of discipline, order, and deference. But on the other hand, the bomb bell, placed in the school not by the centralized state, but by local villagers, could be read also as a nascent threat to state power—the presence of foreign weapons still littering the countryside. Indeed, across Southeast Asia the presence of these bombs is an invocation of a time before territorial national sovereignty and its concomitant consolidation of a monopoly on violence. [87] The bombs rip open the wound of invasion, calling forth the memory of war.

Playing with Bombs

How did fish bombing come to Kendari? My friend Anwar was a lecturer in the ocean sciences department at Halu Oleo University. He explained to me the story as he heard it growing up in the 1980s:

> So the Japanese had a lot of ships in the Kendari Bay, right? Planes from Morotai came here to bomb all the Japanese ships here in the Kendari Bay. But some of the bombs fell in mud—Kendari has a lot of mud, right?—and they didn't explode. So those bombs were taken by some of the locals, because they had seen how when a bomb exploded in the water, it killed all the fish—all they had to do was gather them. And so they learned that you can use bombs for catching fish. From the world war.
>
> So there are bombs that fell in the mud, right? They didn't explode. Those that fell in thick mud didn't explode. But there were also those that did explode—bombs that fell on the coral reef. They exploded, and they killed all the fish. The people could see the fish below the current, still wriggling, but unable to swim—and they would swim down and gather them. So people realized that they could use the powder to bomb fish, and they took those unexploded bombs, brought them home, opened them up, and took out the powder inside.
>
> First, they tried to saw open the bombs, using water to keep them cool. But they exploded! Their flesh was stuck to the tops of the coconut trees. So they looked for a mechanic to do it for them. Another explosion? Try again. Eventually it worked, and you put the powder in a bottle, seal it up, and throw.

> But now all the powder is gone—all used up. So now they use urea fertilizer. Nitrogen.

This story was corroborated by the experiences of people in Nambowatu. Imran's brother-in-law Armin, who wasn't even 40 years old at the time of my research, told me about playing with an unexploded WWII bomb with his friends when he was around 10 years old. Someone in the village had found the bomb and cut it open with a saw to get the powder inside to make bombs. When the adults had left, he and his friends went to investigate; he remembered that it was a bright, sunny day because the heat of the sun alone made the powder inside begin to smoke, and he remembered the overwhelming sulfurous stench of smoking TNT.

I later came across a remarkably similar story to Anwar's, but for the Visayas, in the Philippines, as reported nearly 20 years ago by Marlito Guidote (2001) for the online magazine *One Ocean*. Given that both areas were the subject of intense fighting, as well as home to similar maritime cultures, it is not surprising that they might have similar experiences. He writes of town called "Tangke," the Visayan word for "tank":

> Toward the end of the war, Talisay beach saw fierce encounters between the resisting Japanese soldiers and American liberators. […] Littering the beach were unspent ammunitions and gunpowder, a large deposit of explosive substances. […] Tangke residents […] transformed the beach into a large laboratory for manufacturing explosives. Thus started a homegrown explosives-making cottage industry involving mostly fishers and their families, who began producing explosives for their own use in fishing or to sell to other fishers. It did not take long for the business to prosper. As news of the lucrative blast fishing business spread, Tangke's market for explosives expanded to other towns and provinces.
>
> […] In the 1960s, as their gunpowder stocks dwindled, the explosive-makers switched to nitrates. Nitrates, although relatively weaker in terms of firepower than gunpowder, have the same effect of killing a large number of fishery resources in a single impact. Marketed chiefly for use as fertilizer, they easily replaced gunpowder as primer for explosives, requiring little, if any, new skills for the craftsmen to learn.

However, some accounts place the origins of bomb fishing earlier in history. In his study of bomb fishing in the island communities of Pangkep off the coast of South Sulawesi near the city of Makassar, Muhammed Chozin (2008) describes the origins of blast fishing, noting that as early as 1907 the United States Bureau of Fisheries used bombs to gather samples of marine life in the Philippines. Likewise, Balinese fishermen would steal dynamite used for railroad construction to fish for sardines.

Chozin recounts a story told by his informants of how bombs were introduced as fishing devices, a story that echoes patterns of bomb fishing today in striking ways, as we will see later:

> The Dutch colonialists introduced dynamite to bomb fish in order to speed up the process of harvesting fish, at that time, an annual ceremony celebrated the birthday of the Dutch Princess, Juliana. The ceremony was held on New Year's Day, January 1, in the places under Dutch colonial rule, including South Sulawesi.
>
> The ceremony required a large quantity of fish to be served quickly for the party. Since, there was no advanced technology to quickly catch a large amount of fish, the Dutch army introduced bombs to catch fish. The Dutch then taught the fishermen how to utilize the bombs.
>
> Nevertheless, strict rules applied to dynamite fishing at that time. The Dutch controlled the bombs and allowed the fishermen to use them only for occasional purposes. [...] The fishermen were not allowed to use the bombs for daily fishing activities, except when they were ordered by the Dutch authority. Anyone caught using the dynamite with no order would be sentenced to death (Chozin 2008: 40-41).

Chozin notes that dynamite was an important tool for the late Dutch Empire—it was centrally important for projects of mineral extraction, as well as infrastructural expansions including the construction of railroads. Rudolph Mrazek (2013: 2) describes one such endeavor—a late colonial survey done in advance of a trainline to be constructed through the rainforests in Sumatra, where the crews use the expedition's dynamite to catch river fish for dinner. The bomb in the river, like the fantasy of a train in the wilderness, embodies the affective force of a colonial modernity driven by pursuits of technological magic.

Indeed, while we often think of bombs primarily as tools of war, their power is much broader than this. Beginning in the 19th century nitrogen-based explosives became ubiquitous components of state, industrial, and imperial power. Bombs were just as likely to be used for terraforming, construction, extraction, or scientific research as they were in war.

These stories offer similar views of the origin of fish bombing in Sulawesi and island Southeast Asia—it seems likely to me that they are all at least partially true. Given the dense webs of interconnectivity that linked maritime communities across eastern Indonesia, the potential for using bombs to fish may well have been common knowledge, even among those who didn't have access to state-controlled dynamite. Regardless, together these stories suggest a common truth that perhaps matters more than specific historical detail: fish bombing came as a form of local salvage at the margins of colonial power, pilfering the explosive capacity of empire.

The Fortress in the Hills

There were many nights that I heard stories of gold hidden in the mountains behind Nambowatu. The story goes like this. Long ago, at the end of colonial rule, the Japanese invaded. During the war, the Japanese military set up a strategic base in the mountains near the end of the Tanjung Peropa peninsula. They built a large fortress, an airstrip, and even an underground railroad which would connect one side of the peninsula to the other. They had enormous guns which they would use to shoot enemy planes out of the sky. And inside the fortress they hid huge bars of gold the size of a large ashtray, which is what was used to illustrate the size to me in the retelling.

Folks in the village knew about this fortress—and the gold— from the stories of old people who were enslaved by the Japanese, forced to build it and who worked there. It was also a place of horrific sexual violence. When you finished working at the fortress, the Japanese executed you so that you couldn't return and give away their position or steal

their gold. But a few people escaped and managed to return to the village to tell their tale. They have long since passed away, but the stories live on as part of the collective memory and trauma of Nambowatu.

Once maybe ten years ago, a Nambowatu man was hiking in the mountains when he stumbled upon the entrance to what could only be the remains of the fortress. The man marked the spot with fallen trees and came back to the village to gather a group to go back and explore. But when they reached the spot, the fortress was nowhere to be found, and the trees he cut were missing. No tracks, no traces, no fortress. Everyone understood that this is because the location is guarded by a ghost who keeps the place hidden—in its status as "*barang halus*." The ghost, in fact, was a Japanese soldier—one man who stayed behind when the rest retreated or were captured. His job was to guard the fortress for eternity.

Whenever this story was told to me, it nearly always ended the same way. Once everyone gathered had added their own addendums and slight variations of the remembered past—the small anecdotes from their grandparents—the voices would trail off wistfully, and the group would sit in silence. Then someone would break the quiet by adding: "If we could only find that gold, all our problems would be over." Indeed, this story is multivalent for people in Nambowatu. It invokes memories of violence and terror into the present—memories written into the landscape, even if they aren't always legible. Yet perhaps even more importantly, it indexes the frustration of aspiration and ambition amidst limits. The gold signifies wealth out of sight, out of reach, out of time. The people of the village were cursed to search the same hills over and over for a wealth that was nowhere to be found.

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At first, I wondered about these stories and their relationship to whatever it is that we call "history" (Chakrabarty 2000). But the more I looked for other stories and evidence of the

experience of Japanese occupation, the more I understood the truth of Nambowatu's collective memory.

For starters, the Japanese in Sulawesi *did* enslave many people, whether to work in the nickel mines of Kolaka, the asphalt mines of Buton, or the muscovite mines of Central Sulawesi (Aragon 1996). Indonesian women were trafficked into extensive networks of brothels as "comfort women" to serve military and civil officials; at the end of the war, out of 281 women in all of Sulawesi, 250 were kept in Imperial Navy facilities in Kendari (Horton 2009: 193). The forms of violence reported by Nambowatu memory track in eerily specific ways with accounts of people in other places, such as the stories collected by Lorraine Aragon (1996) of Kulawi highlanders of Central Sulawesi who were forced to work in remote mountainous mica mines for the Japanese:

> During the two and a half-year occupation several villagers reportedly were slain by Japanese soldiers. More died in the mines, killed by falling rocks blasted with Japanese dynamite. Rumours spread among the highlanders that there was a Japanese plan, to be implemented once the mines were exhausted, to murder all local inhabitants over eight years of age so that news of the mining atrocities would not spread. (Aragon 1996: 57)

Even the aspect of Japanese interest in and proficiency with spiritual matters is evoked in Aragon's (1996: 61) report of oral histories of Japanese occupation:

> Mining accidents and intermittent difficulties in locating adequate veins of mica led locals, and reportedly the Japanese soldiers as well, to conclude that their mining activities were causing supernatural offense. Some suspected that the supernatural power(s) ruling the mountains wanted revenge for excavation disturbances and the plundering of mica resources without proper compensation. On one occasion [the village headman] was convinced to sacrifice a buffalo at the mining site to appease whatever deity was angry with the miners."

Aragon documents the cruelty and violence of the Japanese soldiers, who would beat villagers for minor work mistakes, or for failing to show proper deference to the Japanese flag; the villagers had concluded that the Japanese soldiers in fact worshipped the flag as their deity—as insightful an analysis of 20th century imperial nationalism as any I have

heard. The forced work in the mines diverted labor from agricultural production of maize and rice, the two staple foods, and the Japanese further interrupted production by forcing villagers to grow cotton for Japanese textile use; hunger and deprivation soon followed.[88] The soldiers would compel the people to perform otherwise sacred dances and rituals for their own amusement, and would force the men into jumping contests, where the "men were struck with rattan whips to force them to jump higher and higher as Japanese soldiers laughed at their humiliating predicament" (Aragon 1996:56). The violence of occupation was multivalent: threats of death, beatings, or torture; forced labor in the dangerous mines; spiritual danger and odious ritual transgressions; hunger and deprivation; and the burning pain of humiliation at the hands of the occupier. Nambowatu's memories join countless others.

What else? It turns out that Kendari *was* indeed at the very center of Japanese attention from the beginning of the Pacific war. Simultaneously with the launch of attacks on the United States in December 1941, the Japanese began a progressive invasion of much of Southeast Asia. By January 1942, the Japanese navy began a campaign to capture Sulawesi, beginning with Manado in the north, and then subsequently capturing Kendari on January 24, 1942. Sulawesi was strategically located, but poorly defended by the Dutch. Kendari in particular had been a prime target of the Japanese forces due to its recently constructed airfields which were said to be the best in Eastern Indonesia. The small colonial outpost was easily overtaken.

Kendari was a strategic location for the Japanese—within striking distance of Makassar, Surabaya, Bali, Australia, and the Philippines, and offering two sheltered bays to harbor imperial navy fleets without fear of attack. Moramo Bay, known at the time by the colonial name Staring Bay, was one launching place for the Japanese invasion of Java, and a significant part of the bombing campaign against Darwin, Australia on 19 February 1942 was launched from the Kendari airstrips. In early 1942, the Japanese Navy's First Air Fleet,

also known as the "kido butai," including its 6 major aircraft carriers, stationed in Moramo Bay, before sailing for the Indian Ocean raid in late March 1942. I found a striking photograph of one of the carriers, Akagi, "The Red Fortress," stationed in Moramo Bay in March 1942; one of the most infamous aircraft carriers of the Pacific war that helped launch the raids on Pearl Harbor and Darwin.

The material evidence for this relatively brief but traumatic moment in time was everywhere. The concrete structures of Japanese constructed anti-aircraft turrets and pillboxes dot the landscape near the coast and across the city. Several of the small coastal villages still have concrete structures left over from the war—and in one there is a small graveyard for Japanese soldiers, their headstones inscribed with undecipherable writings.

And the ocean here is littered with Japanese ships. I heard specifically of at least three. There used to be one near the entrance to Kendari Bay, but it is nearly buried now by sand (thanks to the deluge of sediment pouring in from upstream—see Chapter 8), with just the top of the mast sticking out. There is also a Japanese ship in the middle of Moramo Bay, not so deep, a big oil tanker, with the top maybe only 20 meters deep, well within our diving range. The spot was well known because for decades the oil could be seen dribbling up from the murky depths, forming a slick on the ocean surface. It has been frequently raided by people scavenging metal, but many of those raiding it have reportedly been befallen by misfortune, Imran told me. When I wondered aloud if we should go explore, Imran quickly declined. He was scared—and politely suggested maybe I could find someone else to take me; I let the matter go. Later another diver bluntly elaborated: every diver who tried to salvage anything from that ship has died—and plenty have tried, chasing after the expensive scrap metal. One guy took the propeller, and shortly after died of a mysterious disease. "That place is sacred [keramat]." The third ship was located not far from Nambowatu, near the tip of Tanjung Peropa at a place called Tanjung Gomo—though sometimes that ship disappears entirely.

Figure 32: Akagi "The Red Fortress" and other ships stationed in Moramo Bay, 1942

Imran told me that divers still sometimes find old bombs, and he and his crew once found an old undersea cable used for telephone or telegrams covered in Japanese writing. They pulled it out and sold it for 4 million, knowing it was worth more. He said in Wawonii, in the mountains, you can find a Dutch WW2 plane wreck which was shot down by the guns of the secret fortress. Indeed, crews across Southeast Sulawesi had made a salvage economy based around the refuse of war. As Imran insinuated, there are two markets for such goods—one in which value is derived from the historical provenance of the objects, and one which values them only as raw material. The former market, which would pay much more for these collectible artifacts, is difficult to access and requires special connections beyond the means of most divers. So the undersea cables, the cladding of old ships, and the bombs themselves are often sold for the metal within them. These divers metabolize the memory of war, dispatching the material evidence for scrap, scrubbing the slate as clean as it will go.

In her 2019 book *Bomb Children*, Leah Zani explores life amidst the material detritus of the US bombing campaign across Laos during the American War in Vietnam. In the book's opening pages, Zani recounts a story that stands in a strikingly inverted contrast to Nambowatu's search for the missing Japanese fortress. Zani's informant recounts a story in which a US soldier glimpses a village from a military helicopter from the sky, but upon landing, the soldiers discover that the village had disappeared. Zani's informant explains that the village belonged to an unseeable world of total peace; a glimpse was offered to the US soldier so that he might realize that another world free from violence was possible. Instead, in Nambowatu, it is the world of war, and a world of abundance and wealth, that is hidden from view, as war's material traces are slowly stripped away.

Indeed, one day when I was visiting Imran's brother-in-law in Laikatahi, he showed me the pillboxes and turrets that litter the shoreline. Around the structures are scattered small piles of black rubber—the insulation from salvaged cables telegraph cables. They stripped away the insulation to get at the copper and left the rubber pieces there to decay under the equatorial sun, slowly fracturing into ever smaller pieces, ever finer particles. These would be blown about like dust, melting into the coastline as infinitesimal trace.

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In 2021 historian David Biggs gave a talk to our research group at SEACoast discussing methods for locating historical imagery from US wars. From Biggs I began to appreciate that in addition to material transformations of the landscape and embodied trauma of survivors and communities, the US military leaves behind archival trash heaps everywhere it goes—dumps and piles of meticulously recorded information, often collected and stored with no apparent purpose other than its own accumulation. Biggs used these archival materials to great effect in his 2018 book *Footprints of War*, which follows the production of militarized landscapes in Vietnam, placing the legacy of the American War in a deeper

historical context where layers of conflict, war, and violence accrete over time, transforming landscapes and the ways that people navigate and interact with them.

Bigg's work is joined by other powerful scholarship tracing how the legacies of war remake lives and landscapes (Rubaii 2018, 2022; Zani 2019). In her ethnography of counterinsurgency in Iraq, Kali Rubaii unpacks the material techniques used by the US military to re-arrange landscapes and movement, including through the use of concrete. The violence of concrete interrupts; it structures one's ability to move, and segments communities and landscapes. Concrete's enduring presence makes the trauma of war a permanent feature of the landscape. Likewise, Leah Zani (2019) explores how people navigate life in the former bombing fields of Laos, where toxic waste and unexploded bombs continue to enact harm decades after the war's official end. The fate is shared by countries across the Pacific, like the Solomon Islands, where unexploded bombs from WWII continue to take lives; in 2021, one Solomon Islands family began to dig a new septic system in their backyard, only to find a cache of unexploded US artillery shells buried in the mud (Lyons and Kekea 2021). Violence is embedded in the landscape, echoing through time.

Biggs' talk was methodological, guiding us through some of the ways he locates 20th century historical documentation for his research. This was revelatory and inspiring, and I became obsessed with trying to find photographs and other evidence of the Japanese occupation and Allied bombings in Kendari. After weeks of searching satellite imagery databases and emailing archives around the world, I followed a tip from Biggs to contact university libraries and stumbled across a database of images at the University of Hawai'i composed of aerial photographs from WWII. I sit at my desk, clicking on undecipherable file name after undecipherable file name, waiting patiently as the images load line-by-line across the screen, the way things used to load back in the early aughts on a free AOL trial, as if tiny builders were scurrying back and forth, manually laying down each row of pixels.

The collection I found contained digital scans of black and white aerial photographs in square format. They are grouped loosely by region, without any accompanying metadata—so sifting through them is a time-consuming labor of insatiable curiosity. But the experience of viewing these aerial photographs is unsettling. We've grown accustomed to Google maps and Google earth, with its straight down god's eye view (Haraway 1988). By contrast these images are all from a clear perspective, a vantage point with dimension and directionality. Each plane was equipped with three cameras, left, right, and center, each capturing images in tandem. The photographic sequences each corresponded to a flight with a defined path from point A to point B, with the camera clicking at regular intervals. Viewing them in the correct sequence gives you a feeling of being strapped to the bottom of the plane's belly, swinging your head back and forth, from left to center to right, as it glides high above the landscape. In many of the photographs you can see the propellers of the plane. It is a jarring image, reminding you of the situatedness of this view, from a US bomber: the view of one empire [the United States] hunting another empire [Japan] which was hunting another empire [The Netherlands].

After hours and hours of clicking and waiting, swinging my view beneath the belly of the plane, I finally find what I am looking for. The image loads, and suddenly I catch a glimpse of Nambowatu far in the distance—unmistakable by the shape of the small bay. The photo is too fuzzy for me to see if there are any houses on the shoreline—or even to make out if there are any clearings or changes in the canopy—swiddens that would betray settlement. There are no ships in the bay—the Imperial Navy appears to have moved on. Indeed, this photo has its date imprinted in the dark frame around it, taken on 30 September 1944, three months after the Imperial Navy had suffered major losses at the Battle of the Philippine Sea, and two weeks after US forces landed at Morotai, from where they would orchestrate a massive bombing campaign of Japanese installations across Indonesia and the Philippines, including littering Kendari with powerful explosives.

Figure 33: View from US war plane with Moramo Bay visible behind the propeller, 30 September 1944. University of Hawai'i MAGIS Collections.

At first, I wonder why there aren't any direct photos of Kendari, which would likely have meant more direct shots of Nambowatu—and then I remember the pillboxes and anti-aircraft bunkers scattered across the shore of the city. Perhaps this flight line is oblique evidence that there indeed was a fortress in the mountains near Nambowatu. Perhaps if the plane had ventured any closer it could have been in the range of the fortress's terrible guns. And then, I sigh when I realize that a well-positioned cloud has stationed itself at the top of the mountain, precisely obscuring the spot where the Japanese fortress should have

been. No other flight lines offer even a glimpse of Nambowatu—so that too shall remain a mystery. We may never know; for now, all that remains is the peripheral vision of empire.

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The metabolism of US war data is sometimes very slow. A year after finding the bomber images, I stumbled across another trove of data. The "Theater History of Operations Reports" or "THOR" database was published by the Pentagon in 2012, with the goal of accounting for every bomb dropped by the US military since the first world war (I imagine the reference to the Germanic father-god of thunder and judgement was not an accident).[89] The founder of the database, Lt. Col. Jenns Robertson, was tasked in 2006, at the height of the most violent period in the US invasion of Iraq, to provide a weekly briefing on all bombs dropped as part of US military operations—a piece of data which the military didn't track. THOR was born as a response, and the founder's interest in military history led him to devote all his free time to extending the database back in time, all the way to the birth of aerial explosive delivery at the end of World War I. This was accomplished by manually inputting thousands of hand-written records—and as you might imagine, this means that the dataset is incomplete. In a 2013 Airforce press release, Robertson said: "We're still hunting for some of the data, and I don't know if we'll ever find it. You ask and you hunt and oftentimes we get lucky and find a trove like in the halls of the Air Force Historical Research Agency where I ran across the bombing survey books that had been untouched for 70 years." And yet despite its incompleteness, THOR tells a story of almost unimaginable scales of violence. The WWII dataset alone includes 178,282 entries representing millions of tons of explosives dropped across the world in the span of just a few years.

For Indonesia, the database is arranged by its own imagined colonial geography, a frozen snapshot of a time when the future of the Indonesian archipelago was uncertain. A search for "Indonesia" returns no results, because it did not exist. Instead, the county is

chopped into mini "theaters" whose terrain has little meaning outside of US slicing and dicing. There are 3094 recorded bombings of CELEBES ISLANDS, invoking the colonial name for Sulawesi—but "CELEBES ISLANDS" here refers not just to Sulawesi, but curiously, also to Maluku.

The records are also uneven; one gets a sense of the different degrees of interest in completing paperwork on the part of pilots or whoever else was tasked with recording it. Some records are strikingly detailed—naming the specific site targeted, exact numbers and types of bombs deployed, the name of the plane used, and more. Other records include only the most oblique data: "TARGET COUNTRY= CELEBES ISLANDS, TARGET LOCATION= CELEBES ISLANDS, TARGET TYPE= UNIDENTIFIED TARGET."

Still many entries unequivocally document the bombing of Kendari; I find the city as "Kendari," but also "Kendahi" and "Kenoari." Despite their paucity and incompleteness, there is enough data there to piece together a story of terror. THOR includes records of at least 114 bombings of Kendari—an average of nearly 1 per week. The first record is from 9 February 1943, and the last from 1 August 1945, 5 days before the United States destroyed Hiroshima with an atomic bomb. Most of the records cite the Kendari Airfield as the prime target; others are less specific, such as "Buildings" or simply "Unidentified Target." The planes were almost all B24 Bombers, nicknamed "the Liberator." The bombers would come in small groups between 1 and 6 planes, although by 1945 the intensity had increased, and records show massive bombardments of 20 or 30 bombers at once.

Explosive technology was so advanced by WWII that the military was spoiled for choice with dozens of bomb varieties.[90] Handy quick reference tables were given to pilots to help them keep their payloads straight (see figure x). This diversity was well represented in the bombing of Kendari. THOR records are divided by the type of bomb used. "HE" or Heavy Explosives were packed with between 100 and 1000 lbs. of TNT; these GP or "General Purpose" bombs were the most commonly used, and the US military dropped at

least 2330 of them on Kendari across 82 missions.[91] The second type were "FRAG" or Fragmentation Bombs, better known as Cluster Bombs; the US dropped 2217 cluster bombs on Kendari—each of which contained dozens or hundreds of smaller bombs.[92] The final category is "IC" or "Incendiary Bombs." These were filled with napalm or white phosphorous; similar bombs were used in the firebombing of Dresden and Tokyo. Some of these were also nested cluster bombs filled with napalm; but many of these incendiary "bombs" were simply 1000lb auxiliary fuel tanks filled with napalm that would be jettisoned over a target. The US dropped at least 143 incendiary bombs across 30 missions.[93] In total, THOR records indicate at least 4,690 bombs were dropped by US bombers around Kendari in the 30 months between February 1943 and August 1945—an average of 5 bombs per day. The scale of the destruction is hard to picture. Indeed, on one website hosting THOR data, Patterson is quoted as saying: "There are scars on the ground for which we had no explanation. Now we can start to see why some of those exist."

The "N" in TNT

According to oral histories, after the locally available unexploded bombs were all used up, fishermen in the waters around Kendari began searching for a replacement—and found it in the weapons of the green revolution. However, the story begins much longer ago, in Tang Dynasty China.

Gunpowder was among the seminal achievements of Taoist alchemy. The earliest confirmed reference to the substance dates to 808AD during the Tang Dynasty, though knowledge of some form of gunpowder may be as old as the second century AD. The production of gunpowder required three elements: a nitrate (usually potassium nitrate or sodium nitrate, often called saltpeter in English), some form of carbon (usually coal), and some kind of sulfur, all three of which occur naturally in mineral form around the world. By the 10th century production techniques had been refined sufficiently to weaponize gunpowder for use in war, and a recipe appears in the 1044 military treatise *Wujing Zongyao*,

known by the English title "Complete Essentials for the Military Classics" (Andrade 2016: 30). The revolutionary technology slowly spread around the world.

The limiting factor in producing these explosives was almost always saltpeter; entire wars have been fought over control of natural deposits, like those of the Atacama Desert—the object of the "Saltpeter War" fought between Chile, Peru, and Bolivia in the late 19th century. Indeed, the Atacama produced most of the world's nitrates for much of the 19th and early 20th centuries in the form of sodium nitrate, called "Chilean Saltpeter." This resource was used both for increasingly intensive agriculture and was a critical component in the increasingly destructive power of explosive technology. From sodium nitrate chemists could produce nitric acid, and in 1847 Italian chemist Ascanio Sobrero accidentally discovered how to use nitric acid to produce nitroglycerin—an extremely unstable and explosive liquid. Several years later it was Alfred Nobel who commercialized nitroglycerin production for industrial use. After a long series of catastrophic accidents, in1867 Nobel produced a much more stable product he come to brand as "dynamite."

Dynamite was so stable that a fuse alone wouldn't detonate it—so Nobel invented the "blasting cap," essentially a long fuse with a tiny fire-cracker sized bomb at the end that you attach to the dynamite. It works on the domino effect: a flame would burn down the fuse, ignite a highly flammable initiation compound, which in turn triggers a small amount of explosive in the cap itself, which in turn detonates the main explosive, in this case, dynamite. Boom. Blasting caps became critically important not only for dynamite, but for many other kinds of explosives; the delay in hand grenades is a version of this same technology. The blasting cap was critical because it allowed you to access the explosive potential of many otherwise stable substances, including the fertilizers used by fish bombers, as we will see below.

The explosive power of nitrogen is part of its chemistry. Explosions do not start with pure nitrogen—they start with compounds composed of nitrogen bonded weakly to

other elements. Ammonium nitrate, for instance, is composed of nitrogen bonded to oxygen and hydrogen. When you light a bomb, a flammable material generates heat, and the energy it creates breaks those weak bonds, freeing up the nitrogen molecules to form bonds with each other and return to gas form—N_2. When nitrogen bonds with itself, it does so with extremely strong triple covalent bonds. While it takes energy (of a blasting cap, for example) to break molecular bonds, the opposite happens when bonds are formed—they release energy. The triple covalent bonds of N_2 are among the strongest chemical bonds possible, so creating these bonds releases immense amounts of energy: Boom.

Indeed, the late 19th century was a golden era for discoveries of the explosive potential of various forms of nitrogen. In 1891 the explosive power of another nitric acid-based chemical called TNT (short for Trinitrotoluene) was discovered, and immediately weaponized. TNT was revolutionary for military use because it was more powerful than nitroglycerin, but stable like dynamite. It was very difficult to accidentally detonate—so stable that it has to be mixed with other explosive or incendiary materials in order to induce an explosion. It remains one of the most important explosive chemicals used in contemporary munitions, found in nearly every bomb dropped during the second World War.

However, the production of the key ingredient for all these explosives—nitric acid—still required feedstock of nitrates, and until the first decade of the 20th century Europe got almost all its nitrates as Chilean saltpeter. That was, until a hyper nationalist German Jewish chemist named Fritz Haber developed a method to create synthetic nitrate by capturing the abundant nitrogen in the atmosphere. Haber had successfully developed the idea by 1909, and by 1913, it had been tweaked and successfully brought to industrial scales of production by Carl Bosch, whose company deployed it to produce fertilizers. It was this domestic industry that provided Germany with explosives even amidst the allied naval blockades during WWI. Despite its role in mass slaughter, the "Haber-Bosch process, as the

technique came to be known earned each of them the Nobel prize (a prize named for the godfather of nitrogen-based explosives).

Combined with advances in the long-range delivery, nitrogen-based bombs unleashed unthinkable bloodshed across Europe. Haber's contributions didn't stop at Nitrogen; he also developed and enthusiastically endorsed the unrestricted use of chlorine gas, mustard gas, and other chemical weapons against all German enemies, personally supervising their deployment on the front lines to horrifying effect.[94] By the end of 1914, after just 5 months of fighting, over 5 million people had been killed; by the end of the war it would be 20 million. 1914 stands as an inflection point, the birth of both industrial warfare and industrial agriculture, sponsored by the immense power of Nitrogen.

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Nitrogen shows us the shared lineages of both industrialism and militarism.[95] We are awash in Nitrogen; you are breathing it now. But unlike oxygen, which you absorb through your lungs, the nitrogen gas is just filler—inert. It goes in, and it goes out. You are swimming in it, but cannot use it. And yet we need nitrogen: it is critical to the construction of every cell in your body and coiled tightly in your DNA. So, like other things we need but cannot make ourselves, we find it by eating others. Before Haber, the fixation of atmospheric nitrogen gas into more useable compounds like ammonium nitrate was the sole provenance of a range of microorganisms, mostly bacteria, called "diazotrophs," (literally "double nitrogen eaters"). Until Haber, every living organism on the planet depended on the nitrogen fixed by these bacteria, which would be passed up the food chain from bacteria to algae or plants, and from plants into animals, including us. Without these bacteria, there is no web of life.

That was, at least, until Haber and the German war machine. Suddenly, fixed nitrogen is everywhere. As of 2010, humans were contributing more than double the fixed nitrogen of all terrestrial bacteria on the planet combined. The Haber-Bosch process alone fixes at least 20% more nitrogen than all terrestrial diazotrophs, and nearly the same

amount as all the marine diazotrophs in every ocean on earth combined. In one century, humans have nearly *doubled* the amount of fixed nitrogen produced each year on our planet (Canfield et al. 2010). This nitrogen must go somewhere, and it often ends up in waterways, sponsoring blooms of algae that create dead zones in places like the Gulf of Mexico, and sponsors the rapid expansion of seaweed that outcompetes corals around the world (see chapter 7). The violence of weaponized nitrogen spirals outward in surprising ways.

After the coup and massacres of 1965, in the 1970s Suharto's New Order regime launched campaigns of agricultural "development" which boosted the use (many say forced the use) of newly bred varieties of rice which gave a crop much faster—especially when paired with immense quantities of chemical inputs in the form of government subsidized fertilizers and pesticides. Nearly all irrigated low land rice cultivation was converted to green revolution techniques and varieties, and massive tracts of flat agricultural land were irrigated and converted to rice production. The objective of the New Order was to make Indonesia completely self-sufficient in rice production—which was a specifically *political* goal of the regime to help legitimate and reproduce itself. This remains true today; one Indonesian rural sociologist explained to me that the government establishes state-controlled rice marketplaces for exactly these reasons of control and the prevention of political violence. Centralized markets allow easy taxation, of course, but more important is the ability to efficiently control and stabilize the price of rice. As he explained, "rice is political. If the price of rice is low and stable, the country will be stable."

Suharto's regime established a program called "BIMAS" short for "Bimbingan Massal Swa Sembada Bahan Makanan," or the mass guided self-sufficiency of staple foods, which offered packages to farmers that included seed, fertilizer, and pesticides. The fertilizers in question were synthetic precipitations of the three great fetishes of the green revolution: Potassium, Phosphorus, and most significantly, Nitrogen. With subsidies and mandates from both the Indonesian government and the major international institutions

including the World Bank and International Monetary Fund, Indonesia was awash in a new weapon.

The fertilizers originally common in green revolution cultivation in Indonesia were ammonium sulfate and ammonium nitrate, both of which contained enormous quantities of nitrogen by weight, and both of which have massive explosive potential. Ammonium nitrate was the culprit, for example, behind the explosion in Beirut in 2020 that killed at least 210 people and destroyed large parts of the city. It was also the same substance used in the Madrid Train bombings, the Oklahoma City bombing, and the 2002 Bali bombing, among many others. It is a popular choice for would be DIY bomb makers. But because of its well-known use as a ready-to-hand explosive, ammonium nitrate is no longer available commercially in many places. In Indonesia and elsewhere, it has been replaced largely by urea fertilizer—which contains 46% nitrogen by weight. Accordingly, fish bombers have adapted, and learned how to "cook" urea fertilizer to create an explosive compound called urea nitrate. The 1993 World Trade Center Bombing used urea nitrate produced from urea fertilizer. Yet although these compounds have explosive potential, they are quite chemically stable under most conditions—a simple fire, for example, would not be enough to get them to explode. Instead, you must first trigger a primary explosion, which in turn will trigger the fertilizer to detonate. Enter Nobel's blasting caps.

Most fish bombs are made from glass or plastic bottles, filled up with the fertilizer and either kerosene or diesel fuel, and topped with a blasting cap with a long fuse. The bottle is sealed using candle wax. If the bottle isn't heavy enough, sometimes fishers will lash it to a big rock to help it sink faster, reaching the perfect depth in the water column before detonation.

It's worth emphasizing that blasting caps are tightly regulated, and usually only available to licensed users working in certain key industries, like mining. But like many technically illicit goods, secondary markets flourish, especially in a mining-heavy province

like Southeast Sulawesi. In other words, it is two forms of state sponsored destructive industrial modernity—industrial agriculture, and industrial mining—the provide the raw materials required for an effective fish bomb.

But beyond providing the raw explosive materials, there are a few other ways to understand how fish bombing is directly structurally connected to the green revolution. The first is the reorganization and reorientation of all agricultural production away from subsistence and toward market-oriented production during the green revolution. The idea of the BIMAS and other state programs was to ensure a constant surplus or abundance of rice, such that growers would dispense with the surplus on the market. This was part of a much larger political economic shift in Indonesia and around the world towards making markets as the primary way that people access and distribute not only food, but all goods. In this new world, where everything must be acquired from the market, finding ways to generate cash becomes central. For disenfranchised coastal communities without land or capital, the way you generate cash is by commoditizing the sea, and by far the easiest marine commodities to sell are fish—hence the imperative to bomb.

The second is an important labor component to this as well: one of the key effects of the green revolution has been a decrease in the labor inputs into agricultural production (cf. Li 2011). This is true in the United States as well as Indonesia; as less labor is needed, more land is amassed and farmed by fewer hands, creating a large surplus of landless-labor—often very quickly. Many of those people ended up being pushed toward the coasts, with the state assuming that the sea would simply absorb and provide them a means to make a living, thanks to its allegedly limitless bounty. As the bounty is exhausted, fisherfolk increasingly turn to the bomb and other tools to make do amidst scarcity.

And finally, the glut of nitrogen washing around the world usually ends up in the sea, where it is the central driver of eutrophication. In many cases, this excess nitrogen creates a bonanza of algae growth in a classic boom-bust manner. The algae gorge

themselves on the nitrogen, and then they die. As they die, the decomposition of their tiny bodies sucks all the oxygen from the water—leaving anoxic waters that kill vast quantities of marine life, including fish. In other cases, the excess nitrogen creates perfect conditions for eruptions of macroalgae that smother coral reefs and other organisms. In other words, the excess nitrogen pollution is a key driver of fish scarcity—the very scarcity that drives hungry people to deploy a bomb to catch a fish.

From Reef to Rubble

Understanding the effect of bombs on coral reefs is all about rubble. Because most bombs explode very quickly after they are thrown, the depth of the water matters greatly. If a bomb lands in deeper water, it will likely explode before coming close to the substrate below; however, if it is thrown in shallower depths, it is much more likely to make contact with coral and cause serious damage. Here you can see that the effects of the bomb are uneven; they destroy shallower coral reefs while mostly sparing those reefs below 15 meters.

It's worth considering the difference between destruction by bomb and destruction by other means. For example, if increased water temperatures induce bleaching in the corals and kills off shallow scleratinian species, this is a major disturbance. However even when the soft polypy tissue of a coral dies, its three-dimensional structure remains in place; the dead coral's skeleton turns into substrate which can be colonized by other forms of life—including new corals, along with sponges, soft corals, and countless other species. The reef may experience a phase shift, but it continues to exist as a reef—that is, a complex three-dimensional structure providing habitat and nutrient cycling for its ecological community. Now consider a well-placed bomb. When it explodes on a shallow reef, it is likely to obliterate the physical structure of the reef in all of its gnarly dimensionality. What is left is rubble. Repeat this process a few times and you have a patchy landscape of coral bommies, little islands separated by channels of rubble. Repeat the process even more, and you are left with a field of rubble and sand.

What happens next within that field of rubble depends very much on the movement of water (Fox et al. 2003; Fox et al. 2005). Imagine for instance that our rubble field is completely left alone without further disturbance. If the former reef is located in a sheltered position buffered from intense wave action and not subject to strong currents, new life will start to grow.

Most sessile marine invertebrates disperse their offspring through a life stage as planktonic larvae. Consider corals: when they reproduce sexually, they shoot clouds of sperm and eggs into the sea which then combine and form a planula—a larva. These larvae may travel immense distances, floating for weeks, before settling on a hard surface where they attach and grow into a colony: think of dandelion seeds drifting high in the air, floating gently down to your lawn. Indeed, when you swim through the ocean you are swimming through a never-ending migration—a cloud of tiny sailboats hitching rides to new horizons.

However, unlike plant seeds, these planulae are also able to locomote, and exhibit preferences for different environmental conditions, including types of substrates and surfaces using rudimentary sensing called "chemotaxis" (though exactly how is poorly understood). What better substrate to settle on than the shoulders of other corals which have died? It's free real estate. Indeed, the calcium carbonate skeletons of dead corals are usually quickly colonized.

But now imagine if this great tide of planktonic larvae washes over a field of rubble. Finding the right piece of substrate is challenging, and the likelihood of success has everything to do with currents. Imagine that our rubble field was situated in a place like Komodo National Park, where the Banda Sea meets the Indian Ocean meet through a series of narrow channels funneled between small islands.[96] Here the currents are extreme and intense: when you dive here you often don't have to move, just riding the movement like those turtles in Finding Nemo. However, the strong currents thwart the ability of larvae to

become established: even if they manage to find a suitable piece of substrate and anchor themselves, the rubble is pushed around, flipped, buried, and shifted by the movement of water. Without a stable surface, these organisms struggle to establish themselves. Rubble fields in high-current areas may take decades to be recolonized.

By contrast, consider the Moramo Bay and the waters around Nambowatu. Sheltered by the Tanjung Peropa peninsula and the myriad large reefs which break currents as they roll into the bay, the water moves incredibly slowly. A piece of rubble is unlikely to be shifted or flipped by the water here, and the planulae have a much easier time getting a foothold and growing into baby colonies.

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Then of course there are the human effects. It should come as no surprise that the bombs kill people as well as fish. A great number of fish bombers are injured or killed each year. There are a few different roles in a bombing team. First there is the spotter, who jumps into the water before the bombing or leans over the edge of the boat with a mask to look for schools of fish and to help aim the bomb. There is of course the bomber who lights and throws the bombs, and there is the diver who uses a compressor to dive down to gather up the killed fish. These roles might be shared among a team or might be all done by a single person in some cases. Each role has its own dangers, though the person handling the bombs is perhaps at greatest risk.

Classic fish bombing technology resembles Molotov cocktails: you light the bomb in your hand and then throw it. Depending on the length of the fuse, in most cases it will explode 5-10 seconds after thrown, leaving little room for error. If the bomb was poorly made or you drop it or don't throw fast enough, it could explode in your hand. Losing hands and limbs to bomb accidents is tragically common.

Partly to improve safety and partly to improve efficacy and accuracy of the bombs, today most fish bombers prefer to use electrically triggered blasting caps, locally called

"charge." The principle is the same, but instead lighting a fuse and throwing the bomb, the bomb remains tethered to a long, insulated cable, the other end of which is held on the surface. Divers carefully place the bombs underwater, and then wait for fish to pass over the spot before connecting the wire to a large battery—like an old motorbike battery—detonating the bomb.

These reduce the chances of explosions in the hand, but also have their own risks. My friends told me a story they heard second hand of a fishing team using charge bombs. The man in the water dove down to place the bomb, but the fish they were after had already swum away; he decided that they should look for a better spot, and surfaced from his dive, bomb still in hand, and signaled to the boat. The boat mistook his signal for the "all clear," and detonated the bomb.

For my friends, this story was meant to highlight the inherent unpredictability of bomb power, and to warn against becoming too comfortable with your own sense of control over things. It was similar, they explained, to their lives with the diving compressor—most of the time it was safe, and you felt you were in control. But the raw power of the machine, or the bomb, and your utter dependence on it and vulnerability to it can set the stage for disaster if you are not constantly vigilant.

Circulating Fish

One morning when we were out on the water, getting ready to dive, not far from the small island that sits in the middle of the bay in front of Nambowatu, a small boat, a long, narrow bodi ketinting motored toward us from across the bay. The boat killed the motor about 100m from our position, and we could see that it was just a single man sitting in the hull, wearing a baseball cap. The man called out "Hoy! Ada ikan?" Do you have any fish? "No, we don't!" Imran called back.

Confused, I asked Imran what the man meant and what he wanted, and Imran explained this man was a fish buyer, a marketeer, who spent his days travelling around the

waters around Kendari in search of small boats with fish to sell. Aware that many fishermen dread the long trek into the city, the risk involved in finding buyers, the social capital needed to make market connections, and the high cost of boat fuel, many were happy to sell to such middlemen even if the price was lower than they might get in the city. But I was still confused: the *Two Sons* hardly looked like a fishing boat. But there was another factor at work here: the marketeer was not looking for just any fishing crews—he was looking for bombers. The *Two Sons appears* to be a bombing boat because of its bright orange shark compressor.

When fish bombers toss their explosives into the water, the effect on the fish is brutal. Fish are able to avoid floating or sinking in the water by using swim bladders—like a little sack of air that allows them to control their depth. When the blast kills fish, a few of them float to the surface, buoyed by still-inflated swim bladders. However, the explosive shockwaves cause most of their swim bladders to explode, which sends them sinking to the seafloor. That's where the compressor comes in: to be a successful bomb fisher, you need both the bomb *and* the compressor. After the explosion, divers hop in the water to gather all the killed fish from the seafloor.

Another key problem for blast fishers marketing their fish is the risk of travelling with the evidence of their blasting. If you are caught with bombs, fish, and a compressor, you risk serious problems with the police. So here the marketeers provide instant cover, a way to launder bomb fish without ever having to leave the site. With no bombs or compressors on their small boats, they can travel freely to the city without fear of interdiction. The marketeers put the fish into circulation as commodities, quickly washed of their explosive origins.

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One day when I was away from Nambowatu, I found myself in the home of some friends of my friend, in a Bajo village outside of Kendari. We were there on no particular business—

just to say hello and talk, to have some coffee and share stories. But just as we were getting ready to leave, a police officer appeared at the door. Sensing tension, we didn't stay to find out why he had come.

On the way home, my friend, who worked for the local university, explained to me that many cops maintain close relationships with Bajo fishermen like those in Bokori. The police will come to them with special requests or orders for certain marine products—usually something like sea turtle, or a large number of fish for a wedding or big event or party. The cops know that their orders are only able to be filled with bombs. My friend told me that his Bajo friend obliges the cop and doesn't even ask for payment—other than the capital provided to cover expenses—because he gains the significant benefit of always having a friend at the local police station in case of difficulty—incredibly valuable for someone whose work involves hurling bombs. If he or his kin get caught, they have an inside man, a patron behind the scenes who can act on their behalf. The fish are treated as a gift, a means of generating reciprocity and protection from the disaggregated state. Yet the reciprocity is uneven when risk is considered—if the cop decides to turn on the fish bomber, his life could be at risk.

A 2009 fisheries law specifically names the use of any tools or equipment which "disturb or damage the sustainability of fisheries resources" as an offense punishable by up to 5 years in prison and a fine of up to IDR 2 billion (around US $150,000).[97] However, while fish bombing is usually thought of as an environmental issue, in rare cases where bombers are arrested, they may be charged not with environmental destruction, but with possession of illegal explosives—an offense to state prerogatives over the use of violence. The law that is usually cited is "Emergency Law Number 12 of 1951," where Article 1, Paragraph 1 reads as follows (my translation): [98]

> Whoever, without right to import into Indonesia, makes, receives, tries to obtain, transfers or attempts to surrender, controls, carries, has stock with him or has in his possession, keeps, transports, hides, uses, or removes from Indonesia any

> firearm, munition, or any explosive material, shall be punished with the death penalty or punished with life imprisonment or a temporary prison sentence of a maximum of twenty years.

Such was the case in late 2021, when Southeast Sulawesi media reported that a fish bomber near Kendari had been arrested under this law.[99] The enactment of such "emergency laws" issued by dictate of the president was made possible by the 1949 and 1950 constitutions (Indonesia later returned to its original 1945 constitution), in the political climate of uprising and political violence that characterized the period after independence (Leyser 1954). This law in particular was targeted at squashing the post-WWII rebellions discussed in Chapter 5, the Darul Islam guerilla rebellions and other guerilla movements during a period that is referred to across Sulawesi and many parts of Indonesia as "the time of the gangs." Despite the source of its power (the 1950 provisional constitution) being withdrawn in 1959, the law remains in force. Today the law is used to maintain the state's complete control over the use of violence; it is also the law most often used to prosecute 21st century terrorists after acts of mass violence. In other words, the book that is used to threaten impoverished fish bombers is the same law that was used to solidify and legitimate state monopolies over violence in the mid 20the century time of rebellion.

Only much later did I realize the striking ways that these fish bomber-police relationships called back to Muhammed Chozin's (2008) story of the colonial origins of fish bombing in South Sulawesi from earlier in this chapter, where fishermen were provided dynamite by the colonial government to furnish food for their parties. As Chozin (2008: 41) wrote:

> The Dutch controlled the bombs and allowed the fishermen to use them only for occasional purposes. […] "The fishermen were not allowed to use the bombs for daily fishing activities, except when they were ordered by the Dutch authority. Anyone caught using the dynamite with no order would be sentenced to death."

Indeed, it is rarely mentioned that the emergency law discussed above was not issued out of thin air, but was a slight alteration of an already existing Dutch law: "Ordonnantie Tijdelijke Bijzondere Strafbepalingen, Indishe Staatsblad 1948 No.17" (The Ordinance on Temporary Special Criminal Provisions). The laws established in this period in the late 1940s and early 1950s nearly all contain similar language referencing the existing body of colonial law that remained in force, which became the scaffolding upon which the Indonesian state and its legal system were established. The colonial forms of power enshrined in the Dutch state are replicated—visible today in the divergent forms of citizenship that divide state agents and the elite from ordinary people who are mere subjects of the state (Semedi and Li 2021). It is the difference between being a well-connected cop and being a disenfranchised fish bomber who dares to hurl a bomb.

Indeed, bombers, like coral collectors, navigate an uncertain relationship to the state and its agents. The state here is multiple: there is the state that grants permits and issues regulations and quotas and geographically defined areas of permissible collection, and then there are the state agents with whom ordinary people are most likely to come into contact with, including all the various iterations of the police both local and federal. Local linguistic references to state agents are informative here. People in Southeast Sulawesi tend to refer to state agents as "petugas" or "aparat," the former translated often as "officer," though it is literally the agentive noun form of the word "task"; the latter is cognate to the English word "apparatus." Cops are discursively formed into appendages of the state, minor tentacles of the leviathan. But these agents are not homogenous representatives of a monolithic state—rather they are quasi-independent actors with their own small amount of power, and who often act in unpredictable ways that may or may not have any correspondence to "law" (cf. Tsing 1993). The state from this view is not singular: it can be wielded for diverse ends.

At the same time, things are not exactly the same as they used to be since the fall of the New Order regime. Decentralization, as the major post-1998 reform movement came to be known, had the broad effect not of removing the ability of public servants to use their power for personal ends, but rather helped to democratize that ability and share it with larger numbers of people (Hadiz 2010). Today more people than ever can drink at the wellspring of state power.

Still, in much of Southeast Sulawesi, avoiding the attention of police is often of mutual interest both for the bombers and the police themselves. Techniques of evasion are not that difficult in the complex coastlines of the area. If in doubt, I have heard reports of bombers stuffing their explosives inside large papayas to help muffle the sounds of explosions.

However, in many cases the bombing crews have prepared for this contingency in advance through establishing the kinds of reciprocal ties with police and other authorities that my new Bajo acquaintance found himself part of. The 2008 film *Sharing Paradise* by Amelia Hapsari, which documents blast fish economies in small island communities in South Sulawesi illustrates these entanglements. The film is set in Balobaloang, an island in a tiny archipelago in the middle of the Flores Sea. For many years, fishers from other islands or from the mainland would travel to Balobaloang's reefs and fisheries to bomb. Many in the small island were angry at the use of bombs in the waters around their islands because of the dramatic impact on their own fisheries. The blasts were so frequent and strong that they shook the small island, causing cracks in the edifice of a newly built mosque.

But the film shows that much of the village leadership (who lived on a neighboring island) including the locally stationed police representative, were getting a cut of the proceeds from the bombing and offering nominal protection to the crews. These village officials collected significant rents from the bombing crews. This is a familiar structure of patronage—one which is by no means unique to Indonesia.

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A few days after our visit to the Bajo village, when I was staying in Kendari, I woke up early to my phone ringing. On the other side of the line was the woman who just a few days before had been having coffee with us as we shared stories. With urgency in her voice, she asked if I had money—money she needed for her children. Fearing that a medical emergency was unfolding, I told her yes, of course, and she asked if she could come to me. Less than an hour later she pulled up on a motorbike taxi in front of my place, and I invited her in to sit, and handed her an envelope. She thanked me, before offering a small correction to her story: Actually, the money is so that I can buy fish. Someone brought in a lot of fish just now, and I want to buy some and sell it, to make some money.

At first, I had assumed that this payment was a gift of charity to help bridge a difficult time to make ends meet. Instead, it turned out to be a gift of capital. Although nominally established as "borrowing," I understood that this modest sum was instead a gift which could help to open up reciprocal ties. Indeed, just before she hurried off, she asked me with genuine interest when I would come back to visit them again to go fishing. Terrible timing for me—it was nearly the end of my research year and I was getting ready to pack my bags. But as she rode off, it dawned on me that the fish she was purchasing were almost certainly bomb fish. Someone likely came into town with a boat full of good fortune. Anyone with a little spare cash on hand could seize the moment to spin this explosion of luck into a small windfall of their own.

Conclusion

I've come to think of fish bombing as inhabiting a space of ferality—a technology of power that broke the bounds of state control and design, that flew the coop or jumped the pond. This outcome should surprise no one: we have flooded the world with a deluge of nitrogen in the form of bombs, fertilizer and waste. Of course, it had to go somewhere, and of course

violence follows it wherever it is found. In a few cases, it has even reappeared as a security threat to the state.[100]

In 2019 a professor at the prestigious Insititut Pertanian Bogor—one of Indonesia's top universities and the beating heart of Indonesia's green revolution and fisheries management sectors—was arrested for producing his own bombs. He had hired fish bombers from eastern Indonesia and flown them to Java to help him build fertilizer bombs to detonate at a political rally in Jakarta. [101] On top of the basic technology of bottle—fertilizer—fuel—blasting cap, the professor added nails to increase the bombs lethality. The fertilizer that began its career as a weapon of global war is repackaged against the state—and by a petty government official no less. Technologies of violence return to haunt the state and its political order—emanating from the university closest to the heart of Indonesia's green revolution. Who knew a little fertilizer and a little kerosene might prompt such questions of the state, the twin violences of militarism and industrialism, and the endless reverberations of war in the landscape.

INTERLUDE
A Ritual Transplantation

In April 2018 I was invited to join a local fisheries ministry office in a coral "transplantation" project they were spearheading on the island of Bokori—the island we visited when we took a trip to the serong in an earlier interlude.

The coral transplantation was organized by the local BKIPM office—Badan Karantina Ikan, Pengendalian Mutu Dan Keamanan Hasil Perikanan, or the "Agency for Fish Quarantine, Quality Control, and Safety of Fishery Products," which is the primary local instantiation of the Ministry of Fisheries; this is the agency tasked with local enforcement of fisheries rules and regulations, including coral inspection and the issuance of the "Certificates of Health" that were withheld during the coral ban.

Today's project was billed as "*kerja bakti*." Kerja means "work," and bakti is a Sanskrit derived word with origins in a spiritual sense of devotion, though today it means something like communal duty. In principle *kerja bakti* is communal labor for the greater good—altruistic reciprocity emblematic of the nationalist ideology of *gotong royong* or mutual aid.[102] Across Indonesia *kerja bakti* is a value instilled from a young age; schools include *kerja bakti* events as part of curriculum, where students, teachers, and families perform maintenance of their own school, picking up garbage, cleaning windows, doing landscaping, and clearing out of drainage ditches. There are many ways to interpret the meaning of *kerja bakti*—including as genuine mutual aid on the one hand, or as community response to state neglect, on the other. Suffice it to say that without *kerja bakti* or *gotong royong*, many rural villages wouldn't have mosques or passable roads. Rice fields wouldn't get irrigated, powerlines wouldn't get strung, and wells wouldn't be dug. A poetic translation might be "labor of love," though *kerja bakti* is more often rendered as the somewhat sterile but properly modern "community service."

However, *kerja bakti* events are often much more fun than they sound. There is sometimes food and music, singing, formal ceremonies and speeches and prayers, sometimes there are special uniforms and choreographed dancing. Sometimes very little work is accomplished—but often work was never the main point: the point was to generate and renew social and communal ties, and to ritually perform devotion to one's community and to the nation.

Even the state itself is not exempt from participation in *kerja bakti*—though they usually make sure to record it and if possible, get it on TV or at least YouTube. Indeed, in this way *kerja bakti* often functions more akin to corporate social responsibility endeavors, but for state agencies. The point here is to demonstrate that the state also cares for the collective, the community, the nation. You fill the potholes and clear the ditches and fix the power grid, and we'll record ourselves picking up garbage on the beach. Hence, I found myself on a small boat puttering across the water to join the fisheries office for a day of national service.

This specific event was part of a broader program initiated by the fisheries ministry under Susi's tenure called GEMASATUKATA (Gerakan Masyarakat Sadar Mutu dan Karantina) or the "Quality and Quarantine People's Awareness Campaign" which sought to "raise awareness" of the work of BKIPM field offices through spectacular *kerja bakti* events. By the program's own description, and by scrolling through its since abandoned social media pages, one gets the impression that this was an effort to raise the profile and assert the relevance of a poorly resourced division of the ministry through mass spectacle.[103] April 2018 was named "bulan bakti" or "service month," and BKIPM field offices around Indonesia held similar events—conducting surveys at fish markets, planting mangrove seedlings, and hosting beach cleanups. In addition to other activities that included giveaways of free "healthy quality" fish, a blood drive, a coloring competition for school kids, and a "men only" octopus cooking contest, the Kendari office had chosen a dual

approach of coral transplantation and cleaning trash from the notoriously dirty beaches of Bokori, which get re-seeded daily by garbage floating offshore from the city.

For the fisheries employees, the event was more importantly a day off—a trip to the beach rather than to the office. Against the monotony of bureaucratic work, *kerja bakti* days offered excitement, novelty, and fun. The day would include specially printed t-shirts, colorful banners, rousing official speeches, and military-style ceremony demonstrating the agency's excellent coordination and unity, as well as signifying its location within the body of the state apparatus. The local Kendari "drone club" had been commissioned to record dramatic aerial footage, while at least four professional photographers and videographers with high end cameras roamed about documenting the day. They even had a custom-built life-size photo frame that was made to look like a picture posted to Twitter (pre-loaded with an ambitious 85,000 retweets and 99,000 likes), where the days participants could pose for pictures, encouraging them to amplify the day by posting on social media. There was also tasty catered food, which was all packed in the same single use plastic materials that the staff would spend the morning picking up from the beach.

By the time I arrived with my friend, there were already dozens of people milling around the island, waiting for the festivities to start. It was a gray, misty day, which made the colors of the custom made white and orange t-shirts stand out even more vividly. Indeed, I was struck by the immense amount of materials that had been specially made for this event—custom t-shirts, BKIPM flags, and many large vinyl banners echoing the color scheme and emblazoned with the GEMASATUKATA logo, a list of the day's activities, the location, the date, and the campaign's official slogan "We make it happen / the provision of healthy food / to improve community nutrition."[104] Indeed, the day's activities are justified in no small part by claims that coral restoration is linked to nebulous ideas of "food security"—a spurious claim repeated by other corporate social responsibility efforts in the marine space—one discussed further below.

Eventually there was a very formal military style opening ceremony. All of the fisheries staff members lined up in straight rows in their special uniforms and stood at attention while various heads of the department and organizers of the day's events led a series of formal talks and prayers, amplified into echoing thunder by a portable PA system, pausing for dramatic effect when the drones swooped overhead. Several styrofoam boxes full of corals were solemnly carried forward to the front of the assembly, like relics of a long dead saint, to be blessed and chanted over by the top bureaucrats—an offering made to the alter of state sponsored development. The final step was a ceremonial transfer of the corals from the head of the local office to the "dive team," who were trusted with delivering the corals back to the ocean.

The leaders of the event had set out the styrofoam cooler boxes full of the corals for the day's transplantation in the front of the crowd for viewing, along with some large letters made of metal which would be affixed to the racks spelling out "BKIPM KENDARI." Each letter had been adorned with tiny fragments of colorful *Acropora* corals, in the hope that they would grow and eventually cover the letters. I pointed out to one of the fisheries officials that there seemed to be a missing letter R. "Nonsense!" He said, before looking again in the box, and then back at me. "Oh… yes… well you know one of the former names of Kendari was "Kendai," and the R was only added later, so this is not a problem!"

The corals in question were a mix of different species and types that had been donated by several of Kendari's 11 coral companies—including the company for which Imran worked. I got the sense that these were the leftovers that didn't make the cut to be shipped; the specimens were clearly not the best or healthiest stock, and the choice of species was also strange—they were mostly corals popular in the aquarium world, but hardly the kind of aggressively growing keystone species that are favored in reef restoration projects. The corals were glued to clay or cement disks, which would then be lashed to special tables that would be placed underwater.

Figure 34 (top left): Corals to be transplanted | Figure 35 (top right): Letters with tiny coral fragments attached | Figure 36 (bottom): The formal opening ceremony.

After the ceremony, the attendees split into two groups—those who would be diving to help place the corals on the tables and then those who would be doing a beach cleanup. Those of us diving donned our gear and headed to toward a series of boats which were waiting to take us to the dive sites. I expected to be shuttled offshore towards the vast reef complex beyond the island and was surprised when the boat puttered about 30 feet away from the beach before tossing an anchor overboard—I actually could have swum the distance faster than the boat.

Two groups of people got in the water. The first were the senior fisheries bureaucrats who may have occasionally been diving for pleasure, and who were to be photographed doing the important work of Coral Reef Restoration: the provisioning of healthy food for community nutrition. The second group was made up of the crew of one of the big coral companies that had a major mariculture farm just south of Kendari. In other words, amateurs and seasoned professionals. I descended as well with my camera, doing my best to keep my distance and stay out of the fray.

Underwater, the scene was pure chaos. Anyone who has been an amateur diver or worked with them knows the difficulty of trying to control your body in an unfamiliar environment; the problem is amplified when you have many inexperienced divers all in a group. Even poised and graceful adults become babies relearning physical comportment, balance, and movement, and it becomes even more difficult in shallow water where the forces of buoyancy are strongest.

The dozen or so bureaucrats flailed helplessly—over weighted, kicking to stay afloat, arms windmilling around and around as they tried to maintain position. They knocked into each other, and their fins kicked up clouds of silty sediment from the seafloor, making the bad visibility worse. Meanwhile, the team of commercial divers working on a compressor gracefully darted in and among the divers, arranging everything. Each of the commercial divers would take a table made of PVC, slowly bring it to the sea floor, anchor

it in place with metal stakes, before returning to the surface for more. For the first 20 minutes they allowed the bureaucrats to do the transplantation for the cameras, which in this case just meant securing the coral fragments to the table with thick rubber straps. After a while, the professionals began to help, finishing whole racks by themselves while the bureaucrats would manage to transplant only a few corals.

It was immediately clear to me that these corals were unlikely to survive: the site they had chosen was far too shallow—less than 10 meters of shallow water on a sandy slope near the beach. The site directly faced the shore of the mainland less than 1 mile offshore, where coastal runoff would be washed directly over the nascent colonies. The water was almost radioactively green with suspended algae—and even at this shallow depth insufficient light would penetrate. And to make matters worse, the tables that were used for the transplantation were far too small—they crammed dozens of corals onto each table, meaning that even if they survived, they would quickly crowd each other out.

Indeed, it became clear that this event had no intention of actually restoring a coral reef. For starters, these were not well-researched and evidenced methods for coral restoration. Quite the opposite, the techniques being used here had been copied (albeit badly) from the standard protocols for coral *farming* used by coral companies in Kendari. More specifically, this was simply the first step in coral mariculture, a process which requires a huge amount of ongoing manual labor and care—labor that had not been planned for and which would not be conducted. Besides, it's not like the coral exporting companies of Kendari have experience in coral reef restoration. That's like asking a vegetable farmer to restore native grassland—the two activities are not compatible.

The Bokori example is extreme in its disregard for its own success, but in some sense, it didn't matter: the symbolic function of the day didn't depend on achieving the stated mission of re-growing a destroyed reef. Instead, it was a ritual mechanism for generating merit and favor—for the fisheries ministry and coral companies alike. The

fisheries ministry performed a service for the People and the Nation, improving their Nutrition—demonstrating their agency's critical role in protecting the oceans, and asserting the relevancy of a small and often overlooked corner of the state. The coral companies, by donating a few half-dead corals and the time of their crews, in turn generated merit from the ministry that was tasked with regulating them. Nobody would come back to check on these corals—their work was complete.

CHAPTER SEVEN
Diving on the Farm

What does it take to grow coral, or to grow a reef? In the live coral trade, corals that aren't collected by divers are grown by coral farmers. Since the early 2000s, these maricultured corals have become an increasingly important portion of the overall coral supply. [105] At the time of my research officially reported quantities of exported maricultured corals numbered in the millions, and for a few species the numbers exceed the wild collected supply.

However, in the process of studying this critical branch of the Indonesian coral economy, I kept bumping into another topic: coral reef restoration, or the idea that humans can coax a destroyed reef back to life. Dreams and talk of restoration were everywhere—I heard of dozens of small experimental projects enacted across Indonesia, and very often local coral companies were enlisted in the effort. Coral companies often supplied the corals for such projects or sponsored the events in other ways. Likewise, it became clear that these projects often mimicked the methods used by coral farms: if the mariculturists can get coral to grow for them, maybe they could get it to grow for itself as well.

I found it impossible to disentangle these two efforts. Afterall, it was the live coral trade that first demonstrated that corals could be grown in captivity, and it was the live coral trade that developed the methods and techniques for culturing corals—getting them to grow in the ocean with human help. The methods used by reef restorationists are nearly all derived from these pioneering efforts, as we will see below. And they are also deeply politically entangled; discursive and material engagement with restoration dreams is part of how the coral industry has managed to stay in the good graces of the state—to keep the economies of permission organized in their favor.

And yet they differ in many important ways. Coral mariculture is a common, already well proven practice. Its goals are clear and achievable—to grow a coral to sell for profit. The timeline is finite and somewhat predictable; depending on the species of coral that you are growing and the environmental conditions, it typically ranges from weeks to months for a small fragment to grow big enough to sell. It's not hard to know if you succeeded: you either have coral to sell, or you don't.

Meanwhile reef restoration is much more nebulous—more a constellation of ideas, dreams, and practices than a singular endeavor. There is no easy way to know if you succeed, because there is no single definition of what counts as a "reef." Possible goals and ways to measure success proliferate: biodiversity, functional diversity, self-sustainability, vague ideas of "food security," biomass distributions, lateral expansion and "spillover,"—the list goes on. Even seemingly obvious measures of success such as "coral cover" are not so straight-forward. The timeline is also unclear: at what point does the project site become "a reef"? And what does it all mean if the reef could be wiped out in a few years by the next climate change supercharged El Nino event?

In this chapter I explore entanglements between restoration and mariculture in the coral world, tracking them across sites in Kendari, Makassar, and Bali. Two key themes emerge from these stories.

First, central to these stories are questions of loss, replacement, commensurability, and substitution—the ways that that one thing is made to stand in for another in a time of loss. As the dynamic processes that sustain coral reefs and the production of wild coral disappear, they must be augmented or replaced—compensated for. My central example here is not just of a human-made landscape standing in for a self-assembled ecosystem, but of the ways that human labor is made to stand in for vanished ecological processes that would have otherwise been provided for by the living world. In efforts to cultivate coral, we see the work of substitution laid bare.

Second, these stories raise important questions of property, ownership, and belonging. As discussed in other chapters, vernacular institutions of property in Indonesia often center around acts of care, cultivation, or improvement. A person that cares for and tends a wild fruit tree may inherit a kind of exclusive right to access and distribute the fruits of that tree; likewise, the planting of trees on a land frontier often confers a sense of ownership (e.g. Li 2014a; Peluso 1996; Tsing 2005). These institutions also extend to sea—where for example, the establishment of a serong serves as a kind of heritable, yet impermanent property claim, as we saw with the example of the Bokori Serong in a previous interlude (see also Adhuri 2013; Satria and Adhuri 2010). And as we will see, when these vernacular forms abut against state notions of property, they can produce unexpected results, and the gaps between these property systems can create novel opportunities. In this view property and ownership are enacted in games of legal play that dance around the multitudinous gray areas between customary practice and formal legal authority.

Coral is not exempt from these circuits where the meaning of property is made through acts of care, cultivation, and protection. Coral farms exploit loopholes in legal systems, and also stake claims based on their ability to demonstrate improvement. Cognizant of these precedents, and aware of the territory-claiming effects of conservation practices, local coastal communities are understandably concerned about the unintended impacts coral farming and restoration might have on their rights and abilities to access the waters on which they live and depend. In this way coral restoration and coral farming are not just about acts of substitution but may also serve as enactments of property.

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But what does coral mariculture and restoration actually entail? Mariculturists practice a technique called "fragmentation," where a parent coral is fractured and used as a starter or seed to grow a new colony—a process which resembles horticultural methods of propagating plants by rooting or grafting branches or cuttings. The fragments or "frags" as

they are often called in the industry, are attached to "tables" or "racks" which are placed in the ocean, and the corals are allowed to grow to saleable size. This works well because many species of colonial corals are evolutionarily adapted to propagate themselves this way; if a piece breaks off on a reef, the severed fragment can anchor itself to the seafloor and form a new colony.

This practice of fragmentation is able to replicate a single coral over, and over and over—turning a single individual into its own commodity category by building up inventory. Consider the Stuber Acropora that we met in the Introduction—one of the first corals ever kept alive in an aquarium, and now found in tanks all over the world. Each specimen of "Stuber Stag" is not just of the same variety; it is a clone, arguably the same dismembered individual whose living body is distributed across the globe.

Fragmenting corals reminds us that substitution and interchangeability are central to the functioning of capitalism—part of capitalism's theory of how the world works. Capitalism is a system of commensurability, working diligently to establish ways to render all things exchangeable through the mechanism of price. Consider the commodity, for which commensurability and fungibility are defining features. Commodities are imagined to be abstract classes or categories composed of fully substitutable pieces; this grain of rice is the same as all the others—I can collect my rice grains from three farmers, and then mix them together in my inventory, scrubbing away any trace of the personal productive connection between the farmers and their crop.

But the coral trade also plays fast and loose with these categories. Commodity categories flash into and out of existence and follow no standardized pattern. As with the "Stuber Stag", one extraordinary coral can be propagated until it becomes its own commodity category—in this case all specimens are fully interchangeable, bearing the same coloration and characteristics of all the others. But other categories are much broader. Some consist of all corals of a specific genera, or species, regardless of color or growth

habit—the "rainbow" mushrooms are an example of this. Companies will compete to introduce new "lines," but also to maintain inventory of "classic" corals, as well as a steady stream of allegedly "one of a kind" specimens—often species that are not amenable to mariculture. Each of these is a technique for drumming up demand and ascribing value through the play of commodity categories.

Beyond the similarities between asexual propagation, there are other ways that mariculture is not unlike gardening or farming. One must choose an appropriate spot, considering temperature, sunlight, and circulation, available nutrients (as well as pollution). One prepares a "bed," and "plants" baby corals with consideration for spacing between individuals, depth, and with an expectation of "time to maturation." Certain species and varieties are fickle, requiring greater depths, cooler temperatures, and less sunlight. Others thrive in hot water and full sun—their only bottleneck is the space available to them, and they will take over the whole bed if you let them. One must also "weed" the coral bed; if the currents are not sufficiently strong, algae and sea grass will begin to cover the beds and corals, blocking sunlight and robbing nutrients. And in many places seasonality matters—monsoon winds can drum up aggressive waves that can batter newly planted specimens.

Corals also interact on the mariculture beds in ways not fully understood by their cultivators or by coral biologists. For example, coral workers have reported that varieties have changed colors over their growth span—brilliant red to muted blue—or even "exchanged" colors, changing from monochromatic to dichromatic or even going rainbow. Purple corals might take on a neon green glow, or brilliant red ones might shift to a single muted blue. These transformations seem to signal interactions across cultivars and even species, and are indicative of the multispecies assemblage that characterizes any individual coral.

Mariculturists variously describe their work in ambiguous terms which highlight the intensiveness of the labor. Common terms are *pemeliharaan*, translatable to care, maintenance, upkeep, or keeping (a term often associated with keeping pets), and *pembudidayaan*, or "cultivation," a term which indexes a specific notion of labor as assisting growth and can be qualified to refer to refer to aquaculture, agriculture, or animal husbandry. Indeed, at the limits of the gardening metaphor, many mariculturists use the language of animal husbandry and livestock keeping (*peternakan* in Indonesian) or language of captive breeding (*penankarang*) with the term "parent stock" or "breeding stock" applied to corals used for fragmentation. The fragments are variously called *pemotongan* (cuttings), *bibit* (seed or larvae), *benih* ("germ," i.e. sperm, seed), or simply "frag," This vocabulary of terms together draws attention away from the biological ontology of the "frag," and instead emphasizes the intensive care-centered work involved in mariculture.

As coral companies improved their techniques, maricultured coral has become an increasingly important source of exported coral. It began a meteoric rise in importance for Indonesian companies starting in 2003, and exports have continued growing since then, peaking in 2017, before the 2018 coral ban (CITES 2022).

While wild coral harvesting and mariculture constitute distinct supply chains, they are connected in important ways. After all, one cannot grow a coral garden without coral fragments, and these fragments must come from somewhere. Wild coral harvesters supply mariculture firms with the stock they need to make fragments and grow new corals. This begs the question: why not simply collect all the interesting corals and mariculture them—making wild harvest unnecessary? There are two answers to this question.

The first is novelty. Like any consumer driven industry, coral trading is plagued by fads and trends, desires for novel color configurations, new species, and unusual morphologies. As certain varieties become increasingly popular and common, and as supply meets demand, the price for these varieties drops. If a company can introduce something

wild and never-before-seen, they are guaranteed lucrative profits. Mariculturing clones of parent stock limits the availability of diversity in coral supply chains, so these companies rely on infusions of strange varieties to satiate demand for novelty.

The second answer is a more fundamental limit to mariculture: certain corals biologically resist attempts at human cultivation. While fragmentation works well for many coral varieties, this is not the case for others. For example, round "mushroom" corals or concave "donut" corals offer no obvious place for fracture, unlike branching corals. If you break them in half—they may heal, but they will bear the scar of their trauma, and most will not survive. Killing the parent stock may cause it to rapidly propagate budded clones, but these too may not survive, and it is possible they will not re-grow. An additional limitation is time. Branching corals grow rapidly from fragments in good conditions—reaching a saleable size in weeks or months. Other corals by contrast take years, at which point the cost of ongoing care vastly outweighs the possible profits. Some coral companies are experimenting with techniques to propagate such recalcitrant corals in cost effective ways. Their success or failure may alter the future of the coral economy. In the meantime, wild coral harvesting remains indispensable, meaning that the fragment and the patch remain inextricably linked.

Incidentally, this also has important implications for coral reef restoration efforts, where the same biological principles are at play: certain species are amenable to use in restoration, and others are not—resisting all efforts to induce them to grow. If these species are to make their way into restoration sites, they will do so on their own—as travelling larvae who may or may not decide to settle and anchor to available substrates on a restoration site.

Still, as discussed in Chapter 1, there was long talk of the government wanting to gradually phase out the collection of wild corals in order to transition to a fully mariculture based coral industry by 2021. Part of this deal included compelling wild coral collecting

companies to show evidence that they had begun to develop their own mariculture operations—in 2017 and 2018 I heard from some coral company bosses that ongoing "quotas" for wild coral collection would be contingent on showing these signs of commitment to a mariculture future. While on its face such a plan sounds sensible, it doesn't address the reality that many or even most of the most valuable coral species that sustain the industry are not amenable to mariculture production as it is currently practiced, if at all. There is a gap of magical thinking here that has yet to be bridged.

But there is another important context in which the policy shift towards mariculture begins to make more sense: the rise of aquaculture as the latest darling of international development. Indeed, the regulatory push to move away from wild collection of corals toward coral farming is not isolated, but rather part of a broader move by the Indonesian government, other states in the global south, and international development organizations like the World Bank, Asian Development Bank, and the UN, which even declared 2022 the "International Year of Artisanal Fisheries and Aquaculture." Aquaculture promises to feed the world through new forms of technically augmented modern development—an offset for declining natural abundance.

This discourse is another linkage between aquaculture and "reef restoration." As we saw in the Bokori transplantation example in the interlude before this chapter, and as we will see below, restoration is often justified as an effort to provision "food security" and "nutrition." The underlying premise is that a healthy coral reef has more fish than a field of rubble or slime: this is true. However, there is little evidence that coral reef restoration is able to sustain itself for more than a few years, and even less evidence that this reef would increase the presence of fish to a degree that would have a significant impact on food availability for local people. There is a huge logical leap being made here. Even so, discourses of food security are key to justifying the incredible allocations of resources needed for reef restoration efforts.

Diving on the Farm

One day I went with Armin to visit the site of one of the big coral farms near Kendari belonging to one of the country's largest coral exporters, PT. Intan Biru Sejahtera. The corals themselves are on "tables" or "racks." Different companies have different designs, some made from metal, and some from PVC, but all are shaped like a low coffee table with cross-bars and slots to attach the corals. Coral fragments are secured to the tables using rubber bands, where they are left to grow to a marketable size. This particular farm was enormous; when Armin told me they had hundreds, perhaps more than a thousand racks, I assumed he was exaggerating—but he was not. The racks stretched as far as I could see.

That day I was able to bring my own SCUBA gear and rented some tanks from a local dive shop. The rest of the crew were diving on one big compressor—a larger, more powerful model than Imran's with enough capacity to support 5 or 6 divers. This kind of diving was different than that of foraging work, and this difference translates into different equipment and even different bodily comportment. For starters, the divers don't wear fins, instead opting for simple rubber cleats. The cleats were the kind designed for use in the rainforest and plantation; when I worked in Sumatra a decade ago, these were the preferred foot ware of jungle guides, hunters, and forest product collectors. They are laced tight to the foot, no socks, and provide excellent grip whether packing heavy loads up riverbeds of slippery rocks or stalking an orangutan up and down the damp leaf littered hills of rainforest, where my expensive American hiking boots were practically worthless. And here they were again, this time on the bottom of the sea, where the rubber teeth could dig into the sand and protect soft skin from scratches, stings, and bites. Since many sites were relatively shallow, where the buoyancy tries to pop you to the surface, the divers wore belts of lead weights to help them stay submerged. Where scuba divers prize themselves on being able to hover horizontally like a fish, for these divers, the pinnacle of skill was to stand vertically as if on land, and to walk bipedally on the seafloor.

This day the crew had a few different tasks. Some of them were transplanting out fragments that had been collected from the company warehouse. But most were there to play herbivore, wielding the kind of broad brushes that you might use to scrub a floor. The divers furiously go to work brushing off the algae that carpets the tables and racks, first appearing as a thin green slime. The place where the racks are growing is a sandy slope without any coral at all. While some herbivorous fish come in to help, there are not nearly enough to mitigate the heaps of algae that accumulate on the corals and the racks, and the rack-farm lacks the three-dimensional complexity that would give those fish places to hide. Other invertebrates like urchins and crabs simply weren't able to climb up the slippery PVC legs of the tables that suspended the corals in the air.

The scrubbing quickly fills the air with a lurid green as the pulverized algal tissue floats away from the furious brushing. I immediately understand why the divers are all wearing wet-suits and gloves: the algae stings as it swirls around the body—what the divers call "gatal," or itchy, though I think it is more painful than that. I was happy for the rash guard I wore, though my exposed hands and legs were not spared.

Both restoration and mariculture suppose that artificial environments and human inputs can be used as substitutes for ecological functioning. In this way coral mariculture and reef restoration practices highlight questions of loss and substitution—the ways that one thing is made to stand in for another, like humans with paintbrushes standing in for bees in a Chinese apple orchard, or humans with scrub brushes standing in for parrotfish on an Indonesian coral farm. And yet as we have learned from feminist economic thought—not all labor is interchangeable; difference continues to matter (Rofel and Yanagisako 2018). Is a human with a scrub brush really the same as an herbivorous fish? What of processes that cannot be substituted? What are the limits of replacement and substitution in this time of loss?

Figures 37 and 38: Diving on the farm at PT. Intan

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It is of course also possible to grow corals in aquariums, rather than in the ocean. However, the costs of doing so are often much higher—especially at the scales needed to be profitable. These higher costs represent the need to find substitutions and replacements for the missing oceanic processes and conditions that mariculture allows you to access for free. These include water changes, waste removal and nutrient cycling, temperature regulation, water movement or "flow," the addition of trace minerals, provision of bright light for photosynthesis, and more. By looking at what it takes to grow a coral in an aquarium, you begin to understand the infinite way that we rely on the living world for care and provisioning, and the unsatisfactory alternatives available.

However, there are still many tasks left for humans to do on a coral farm. Indeed, the labor inputs for this kind of operation are surprisingly high: removed from any semblance of a functioning ecosystem and located in a sunny, shallow spot, maricultured corals are sitting ducks for their arch nemesis: algae. The divers were brought in as replacements for the vast diversity of herbivorous fish, crabs, urchins, and other algae eaters who had been extirpated from the landscape. To understand this better, it helps to consider how corals live as part of a community on a reef. On a healthy reef, a coral is simply one piece of a puzzle—albeit one of the key pieces. It is a story of reciprocity.

Corals give. They give mucus: healthy corals are slimy, covered in a thick layer of mucus that acts partly as a form of immunity and defense, and partly as a tool for capturing prey in the form of tiny particles and bacteria floating through the water. The bacteria rich mucus is constantly sloughed off into the water, where it becomes a valuable food source for sponges and other filter feeders. The coral mucus is a rich infusion of organic matter into a low-nutrient environment, and it kickstarts a food web that sustains many others. Somewhat more famously, corals also give shelter, structure, and habitat—both by adding three-dimensional complexity to the homogenous water column, as well as providing

habitat for tiny organisms that live inside the vast cavern systems of the porous coral skeletons themselves. Without stony corals there would be almost nowhere to hide on the reef—no reason for fish, crabs, tunicates, starfish, bivalves, nudibranchs, or any other organisms to set up shop here. By offering shelter and food, the corals give the reef a chance to become an ecological community of bewildering complexity.

But corals also receive. Corals grow slowly, and they rely on the services of herbivores to mow down the fast-growing algae that would otherwise smother them. On a biodiverse reef, this is work gladly done by countless species of algae-eating fish, sea urchins, crabs, limpets, snails, chitons, and polychaetes, among others. Without a retinue of algae eaters to keep the balance, corals are quickly overcome.[106]

And so, in coral restoration and mariculture contexts, which tend to be sited on places devoid of existing reef communities, there is a problem with missing herbivores. This is especially true in nearshore waters where nutrient levels are higher, and even more so at a time when humans flood the oceans with nitrogenous green-revolution waste.

The critical importance of this coral-herbivore relationship is demonstrated clearly in the work of coral mariculture and restoration. In these settings, devoid of such reciprocal communities, there is nobody to clean the algae growing all over the corals: and so, people do it. Indeed, there are many different tasks and kinds of work done in the process of coral mariculture and restoration, but if measured by quantity of time, scrubbing away algae by hand utterly dominates all others.[107]

Pulau Serangan

To really understand coral mariculture, we need to take a short trip to Bali, one of the central nodes in the global live coral economy. In many ways Bali is a world away from Kendari and Southeast Sulawesi, but in other ways the two are intimately connected. It was companies and entrepreneurs from Bali that first "discovered" Kendari as an important source of extraordinary live coral, and today many of the most important companies are

headquartered in Bali, with Kendari "field offices." Many of the most important Kendari divers and leaders, including Imran and one of his neighbors and associates Abdul (who we will meet below), had spent sojourns or sabbaticals in Bali, travelling around important aquaculture sites, warehouses, and offices on the island, gaining first-hand knowledge and experience about the supply chains and business practices—knowledge that they viewed as centrally important to informing their work as divers and collectors. While the stereotypical model of Indonesian power is seen to radiate out from Jakarta, in the Kendari coral world power rests in Denpasar.

Bali plays a double role in the live coral industry as both a primary export gateway and as the epicenter for coral mariculture. Coral mariculture operations are scattered around the island's coasts, with major centers concentrated in the Banyuwangi region of East Java just across the strait of Bali and around Pulau Serangan, a small island located in Bali's Benoa Bay just south of the regional capital Denpasar.

Pulau Serangan was previously a tiny coastal island home to Balinese fishing communities and iterant populations of maritime Muslim communities. The island hosted a dynamic mosaic of coastal ecosystems, including mangroves, coral reefs, and coastal wetlands which were destroyed in 1997 as part of a major land reclamation project orchestrated by the son of the former Indonesian dictator Suharto with the goal of building a luxury resort complex with private beaches. Through intimidation and violence, Tommy Suharto's company acquired rights to a large portion of land holdings on Pulau Serangan and dumped thousands of tons of dredged sand and coral stone on top of the adjacent wetland and reef, tripling the island's land area and destroying the fisheries. Between the crash of the Indonesian economy in 1997 and Tommy Suharto's convictions in 1999 and again in 2002 (first for a land scam that defrauded the government of over IDR 90 billion, and then for assassinating the supreme court justice who declined a bribe to overturn the first conviction) the development project was put on indefinite hold, leaving the bulk of the

reclaimed area a barren wasteland slowly colonized by pine forests (see figure 7). The land—and the sea—remains expropriated from the people of Serangan.

In its abandonment, the island's artificial lagoons and coasts with strong currents were discovered to provide ideal growing conditions for coral mariculture. Today, the coast is dotted with coral gardens. Some are small independent squatter operations, but most are operated by large coral exporting firms. All are staffed by the island's disenfranchised fishermen and women, growing coral in artificial setups on what used to be a thriving reef assemblage. Reef is replaced by plantation.

In a conversation with the manager of one company, I asked what these squatters and companies would do when Tommy Suharto's company finally moved ahead with building the resort. He shrugged, saying that Indonesian law forbids private ownership of coasts, or of blocking coastal access to the sea. His gardens, safely nested at the edge of the intertidal zone and a gray area of the law, were technically beyond the reach of private property—even on the island built from nothing. He expected there would be legal challenges in the years ahead as Suharto's company and other major reclamation projects attempted to assert total ownership over their creations. In that case, perhaps they would have to relocate. But for now, the strange stalemate persists, and the corals grow.

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In early 2019 I came across an Instagram page called something like "Bali Coral Farmer," fed to me by an algorithm that seemed eager to help with my research. The page caught my attention for a bunch of reasons. First, it was run by a woman—the first coral company with a woman head that I had yet seen. Second, this page was clearly an act of intentional transparency, showing off production techniques, coral stock, and commenting on the labor of coral farming—a stark contrast to the ways that most coral companies operate in great secrecy, uninterested in outside attention. And third, the company was actively working and posting almost a year after the closure of the coral fishery, when many other

such pages had gone dark. I sent the page a message, asking if I could visit their farm, and the page's manager, Ibu Ester replied with a warm invitation.

In July 2019, we met at a place called "Kadek's Grilled Fish Shop," which it turns out is owned by her main local counterpart, Pak Kadek, who is in charge of stuff here on Serangan. I met Ester and her husband Arjun, as well as Pak Kadek; Ester is the brains and passion, Arjun does the books and the marketing, and Pak Kadek is the operations manager on the ground. Ester and Arjun are Javanese from Yogyakarta, and Catholic, but have been living in Bali for about 10 years now, since 2009. Pak Kadek is a Balinese Serangan local; he and his sons are spearfishermen. The fish they serve in the restaurant they catch themselves—and sell the rest on the side. To drum up business, Kadek sends out WhatsApp blasts to all his contacts with pictures of the day's catch. My phone still chimes once or twice a week when Pak Kadek's photo arrives, showing off a bucketful of fresh fish.

Ester used to just have aquariums as a hobby—she was passionate about it, and was good enough that she eventually opened a little shop in Yogyakarta to sell the corals and other things, and got herself a reputation as a retailer in the domestic market, getting her stock from the big companies that had collection and mariculture permits. Eventually she was approached by some government folks who asked her why she didn't get into the export business, since she was good at this thing. Ester and Arjun decided to go all in on this route and moved to Bali. She spent two years working to get all the permits and licenses in order so that she could set up shop. She had no interest in wild coral, only in mariculture, and followed other companies to set up her farm on Serangan, making use of the accumulated local expertise.

By the time the coral fishery was closed last year she had about 500 tables on her farm and 24 full time employees between the farm and the warehouse. Now they are down to 10 employees, and not all full time, and about half of that number of tables. They also

have an operation in Banyuwangi which is where they keep their deeper corals; Arjun was on his way there the next day after our meeting.

Still, they are caring full time for all of the remaining corals with the idea that the fishery is definitely going to open again, and in that case, Ester will be one of only a few who has stock ready to fragment and sell. However meanwhile, this has meant that they are basically hemorrhaging money. At one point I asked if they were divers, and Arjun said he used to have equipment, but he had to sell it, along with a lot of their stuff, even the company car—to be able to make payroll. The other employees that they had to let go of they continued to support until they were sure that they found other employment that would cover them.

Ester actually got the idea to start the Instagram page only after the fishery closed, as a way to document for skeptics how the industry works, how much labor and money it requires, and how it is affecting both the corals the livelihoods of the community. They discussed it as a kind of "soft" protest or "soft" diplomacy which they thought was a more strategic way to move ahead than demonstrating in the street or press. She mentioned several times that whenever she met with different fisheries government people, she always gave them open invitations to come check out her operations—"come anytime, you don't have to tell me before, whenever you want, just come and see what we are dealing with and how the work goes." Yet so far, I was the first to visit.

Ester and Arjun were savvy businesspeople and skilled in the kind of bureaucratic negotiations necessary to stay in business—to navigate the economy of permission. They are also well connected in local politics, which kept them in the know about what was happening in government offices upstream. They seemed to have an idea, for example, that Susi would not remain the fisheries minister for long. Jokowi had just been reelected to a second term, which meant that announcements of a cabinet reshuffling was due any day—the time to use political appointments to re-pay supporters and appease adversaries after a

brutal and divisive election. They were hopeful that a change in minister would result in a lift of the coral ban, and a resumption of their business. Indeed, a few months later, in October 2019, Jokowi announced the formation of his so called “Kabinet Indonesia Maju,” or the “Onward Indonesia Cabinet,” replacing Susi with Edhy Prabowo, a member of an opposition party who did in fact re-open the coral trade (Probowo’s tenure, however, would last just one year before he was convicted of accepting bribes to grant export permits for lobster larvae, after reversing a ban on lobster larvae exports that was one of Susi’s key policy interventions).

While they waited for a regime change, Ester and Arjun were getting their paperwork in order. They walked me through how the permitting system works for them and for all mariculture operations, which differs from the ways that wild coral is regulated and permitted. Instead of being governed by quota, they are governed by their own "production plan" (I: rencana produksi) which they produce annually and share with regulators. For example, if they have a certain number of “induk” or “mother” corals, then they plan that they can fragment those corals x number of times, and thereby they arrive at specific numbers of expected production. These figures are (in theory) cross-checked by a series of audits that examine administrative records as well as the actual production site of the farm—to ensure that the plan is being carried out in real life; these audits theoretically will prevent farmers from laundering wild corals as maricultured.

Ester and Arjun said that the audits they had been through are quite intense—there are cases where their corals look so healthy and are shaped so naturally that they are accused of having been wild caught, rather than maricultured. Pak Kadek explained that this is because he knows how to cut them from the right place so that the fragments grow with a pleasing shape and appear natural—*as if* they had just been plucked from a wild reef; like bonsai, this is an art of evoking the essence of the real thing. Having seen it myself

elsewhere, I didn't doubt his ability. But still, this highlights the difficulty of distinguishing maricultured corals from wild corals—how can you tell which is which with any certainty?

I asked what would happen if they wanted to start a new production line of a new species. Ester said they need to submit a request to the Ministry of Environment, who would then issue them a permit to collect, say, 32 corals from the wild, which they would purchase from another coral company who had a permit for wild collection. Then they would be given 2 years to produce, say, 200 corals from those 32. After two years there would be an audit, and if everything looked above board, they would get export permission for that new line.

At the end of our conversation, they showed me lots of pictures and videos of their farm after a year of no exports. They had continued to care for their inventory but had stopped fragmenting them to produce new colonies. Instead, they were caring for the "mother" corals, with the expectation that the minute the export ban was lifted they could get to work fragmenting them and have saleable stock ready to go much faster than the competition.

The skill and diligence of their farmers was clear from the photos: their corals are enormous, and they grow quickly. This is to do partly with the setting: the reclaimed shores around Serangan have ideal conditions for the kind of mariculture they do; the fake beaches and shores made entirely of sand have very low nutrient levels, which slows down algae, and the shore is swept by a fast current that pulls up cooler water from below while removing waste and inhibiting the settlement of other sessile invertebrates. Even still, they have issues with coral bleaching when the water temperatures get too hot. But where other companies freak out at the first sign of a bleached coral, often pulling out whole tables to relocate them to cooler water, this company takes a more measured approach, usually leaving their corals in place, cutting their losses from those that die, and re-growing new

stock from those that survive; a kind of natural selection designed to build up an inventory of stress tolerant corals.

Still, the corals on their farm reflected the kind of care they were getting—they were growing wild without any haircuts. They showed me before and after photos of tiny fragments growing to 50cm colonies in just one year; this is good but creates issues of space. Some of their tables had gone so wild that they had begun to look more like tiny coral reefs—including a few other organisms that had moved in, including fish, tunicates, crabs, and other invertebrates. Even knowing the amount of labor involved, from this view it's not hard to begin to imagine, to let yourself believe just for a moment, that *anyone* can re-grow a coral reef.

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The next evening, I got in touch with Pak Kadek and went to see him and his family at his restaurant and bought him a beer while we chatted. He's a friendly guy, someone who likes to make friends with everyone he meets, from the perspective that you never know where a new connection will take you.

He was born in Serangan in 1965. When he was younger the economy here was completely based on fisheries, and the island was surrounded by mixed wetlands, mangroves and most importantly mudflats and seagrass meadows. The island was famous at that time for its large number of turtles in part because of the extensive seagrass. When he was young, he was involved in all kinds of business, but the most important one and one which employed a lot of people in the village was collecting larvae of milkfish. The juveniles, which were the size of a human hair, could be easily found in large groups in the mangroves and shallow tidal flats of the island. Folks would catch them with a net that basically looked like cloth because it was so fine. These larvae would be sold to other parts of Bali and further afield for people to raise in aquaculture pens in the ocean, and it provided a good income. There were also other products—panoplies of fish, crabs, and shrimp, all of which could be

relied on for food or cash. But the trade, the milkfish, and all the other creatures were lost when reclamation came.

The same thing happened to the island's bustling seaweed economy. In the 1980s seaweed farming was introduced to the island—perfect for the shallow waters. And unlike Nambowatu, seaweed stuck around on Serangan. For nearly 20 years the main livelihood aside from fishing was seaweed, and the income was really substantial. Pak Kadek told me that in 2 months they could harvest 1.5 tons, which sold at a peak of about 15,000 IDR per kilo, which was back when the rupiah was strong, so they would make like 22.5 juta every two months, and back then the rupiah was like 2-3000 per dollar, so that was a fair amount of money especially for the time, and they were able to do that several times a year with minimal labor input (mostly around harvest and planting, he said it was just like with planting and harvesting a sawah). The place where they used to do the seaweed cultivation is now dry land; he showed me on google maps—an area just southwest of the bridge. When the excavators came, an enormous part of the village lost its livelihood almost overnight.

The reclamation was done with force. The military came into people's homes and forced them to sell at a price pre-set by the company. They were paid only 2.5 million for 100m2 of land which is today worth at least 600 million. People who refused were terrorized and tortured, and some were arrested. In the end, they all sold: how could you resist the power of the dictator's favorite son? After Tommy Suharto's arrest, the construction and reclamation stopped, and has sat largely unchanged for nearly 25 years—largely thanks to powerful community organizing and mass protest efforts to resist further reclamation projects under the banner of "Tolak Reklamasi," or "Reject Reclamation."

The people of Serangan tried to find ways to make a living on their new moonscape of an island, most of which remained private property off limits to them. They tried to resume seaweed cultivation in the early 2000s but found that the conditions were no longer suitable—the water was too deep, and the currents were too strong; production suffered.

But just then a new kind of mariculture found its way to the island—a coral farm. First came PT. Cipta, Imran's company, quickly followed by others. The disenfranchised fishermen became a skilled proletariat of coral cultivators—a turn of the millennium example of primitive accumulation alive and well.

Restoring Coral or Claiming Territory?

It's worth re-emphasizing that in our current moment, hurtling towards the unthinkable chaos of climate change, the continued existence of corals and coral reefs is not a sure thing. Without knowing how bad things will get and how quickly, we cannot say what future there is for coral on this planet. Of course, the likely widespread demise of shallow reefs dominated by scleratinian corals does not mean the end of all reefs. Reefs can persist in many forms, dominated by dominated by soft corals, or sponges, or any number of marine invertebrates, and coral reefs will likely persist in deeper waters protected from temperature fluctuations. Yet these reefs will be something altogether different than the shallow coral reefs we know today; because of their unique abilities to fix calcium carbonate, the particular three-dimensional complexity and durability of a coral reef is very difficult to replicate with other organisms. Coral conservationists and biologists are debating with serious gusto what to do about their loss, and among the most hotly debated ideas is about coral restoration.

The crux of the debate can be summed up easily enough. Those who favor restoration argue that we must be rapidly and aggressively *reversing* the habitat loss from the last century of wanton destruction that has left us with a small fragment of the coral cover and biodiversity we once knew. By increasing the sheer amount of coral reef cover, we increase the odds that at least some patches will be able to adapt to new climatic realities and survive into the future.

However, the skeptics contend that coral restoration as practiced today is little more than a waste of already limited resources. There is little evidence that it is achievable,

let alone sustainable on the timescales that count—decades. Plus, restoration is extremely expensive on a cost-per-area ratio, meaning that it takes large amounts of money, resources, and labor to do restoration on even a small scale. Money is already scarce in conservation—so from this view, allocating precious time, energy, and money towards transplanting corals out onto blasted landscapes without addressing the causes that killed the corals in the first place is lunacy. Everyone knows that conditions today are worse than they've ever been and continuing to deteriorate—why restore a reef that is destined to be re-destroyed?

The skeptics frequently invoke the adage that "an ounce of prevention is worth a pound of cure," arguing that the funds, time, energy, and discursive space taken up by the restoration crowd would go much further if applied to efforts to conserve the reefs we still have. Coral conservation, they argue, is itself also coral restoration; reefs which are intact and functioning will also spread and seed new reefs more effectively than humans ever could. They argue that "coral restoration" is allowed to stand in for much more meaningful efforts to conserve already existing coral reefs.

Restoration advocates would concede some of these points: it is still an unproven approach, and it is expensive. But all conservation approaches, they argue, must begin somewhere—how will the techniques improve and become more cost effective if nobody tries? Plus, they often point out, it's not as if traditional conservation methods have had predictably successful outcomes in protecting reefs (cf. Bruno, Côté, and Toth 2019).

There is another important element to this debate. With a few significant exceptions, the ranks of those who push hardest for aggressive restoration are filled with lay enthusiasts, while the skeptics are largely seasoned and cynical university biologists. Many transplantation and restoration projects are volunteer organized and run, often staffed by wealthy young people from the Global north for whom the experience is a fulfilling focal point for extended travels and vacations—and it doesn't hurt that photos of

white 20-somethings "restoring" a coral reef often play well in the libidinal economies of social media algorithms. This division creates a problem of communication and knowledge transfer. Lay restoration practitioners have rarely published anything about their projects, and rarely have had the training or expertise to use standardized ways of monitoring their progress. Reports of success or failure are largely anecdotal. The university biologists point out that this re-doubles the waste of precious resources, as restoration projects around the world repeat the same failed experiments over and over, unable to learn from the failures and occasional success of their peers. The "unscientific" efforts are therefore ignored by the university biologists.

Part of the problem is that the methods and techniques used by different projects vary greatly. In a clear demonstration of the genealogical connection to established practices of coral mariculture which inspired them, most projects involve the deployment of some kind of artificial structure, whether a series of suspended ropes, or more commonly some kind of metal or plastic "table" or "rack" which is fixed to the seafloor. Corals are then attached to these structures and left to grow—with the hope that they will eventually obscure the support system and continue to grow unaided, providing their own successive structure. This is not to say that there are not high-tech, high cost, cutting edge scientific forays into coral restoration. Some sophisticated programs are inducing corals to spawn in captivity and using the resulting larvae and baby corals as stock for restoration—this has the benefit of ensuring genetic diversity on a restoration site which otherwise might be filled with clones. Indeed, one team at the university of Hawaii has begun developing a program of "assisted evolution" as a component of coral restoration, an approach that encompasses a variety of techniques to manually induce corals to develop resiliency to climate change through combinations of lab-controlled natural selection, epigenetics, and alterations to the microbiome. Still, such techniques often contribute to the problems of

high-cost, and the vast majority of restoration projects rely on good old-fashioned fragmentation.

The typical "coral restoration" project in recent years has been short lived, volunteer run and organized, designed and implemented without scientific input (often in tourism settings), conducted without standardized or scientifically meaningful monitoring of the outcomes in either the short or long term, and covering a tiny area—often less than 100m2.[108] Each of these factors contributes to high rates of failure. But as we will see, even large, well-funded projects have limitations.

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In 2019 during a summer trip back to Sulawesi, I visited a coral restoration coral restoration project on a small island near Makassar in the. The island, like all the islands here, are densely populated, home to a mix of island locals and transplants from the mainland. Over decades of intensive and destructive fishing, most of the fringing reefs around the small islands were turned to rubble.

The project site was a corporate social responsibility program sponsored by a philanthropic wing of Mars Inc., of Mars candy (think M&Ms) and pet food fame. The restoration was a project of Mars Symbioscience, and led by Frank E. Mars, son of the current chairman John C. Mars (who has a personal net worth of between US $30 and 50 Billion; the Mars family is the second richest in the world, with an estimated net worth of $142 Billion, second only to the Walton family of Walmart Fame). The site is probably the best-known coral restoration programs in the world, for good reason.

Corporate sponsorship of this kind is something that most conservation projects only dream of, and those resources were put to good use. Unlike most other restoration projects which I had visited or heard about, this project partnered with eminent, credentialled academic marine biologists with decades of experience to help design and implement the project. They even had a team of social scientists to study social attitudes

toward implementations (more on that below). The project was the first real world build out of a promising new restoration technique using small dome-like cages, shaped sort of like an unfurled umbrella, made of specially coated steel rebar to which coral fragments would be secured. When arranged together, the domes created an undulating three-dimensional reef structure which closely mimicked the kind of geometric heterogeneity one would find on a wild reef. And indeed, early data collected by researchers showed that this technique was exponentially more successful than virtually any other commonly used restoration technique. In other words, this project was at the very cutting edge of restoration. And yet even it had its limitations and issues.

I was invited by project staff to visit the site on a day when they were doing both transplanting and maintenance. Even though the water was very shallow—between 1 and 2 meters—we worked with SCUBA gear so that we could be more efficient, keeping our faces in the water and avoid the hassle of snorkeling. Some of the team members worked on placing new infrastructure on the complex and then attaching baby corals. I was handed a scrub brush. The work was exhausting; we spent hours carefully brushing away the slimy algae that accumulated on the spiders and the corals. Because of the scale of the site, it took a whole team many hours just to do one small portion.

The task of brushing is not a skilled one: anyone who has scrubbed a floor can do it. However, because of the structure of the reef, with very little room to maneuver between the spiders and the corals, only an experienced diver with good bodily control in the water could successfully do this without bumping into the baby colonies or kicking them with your fins. This quickly narrows the available labor pool to small subset of people with the relevant skills, and potentially makes the labor costs much higher. And diving safely is a costly endeavor: SCUBA gear is expensive, the tanks needed to dive are expensive, the compressors needed to ensure safe, clean air to breath is expensive, and the expertise to manage all this is expensive.

But the experience left a true impression on me. The technique was clearly working. In many places the coral had already grown so much that the spiders were completely hidden from view, leaving the impression of swimming over a healthy reef. The success was evidenced by the arrival of other compatriots to the site: fish, tunicates, crabs, sponges—many types of reef creatures were moving in to call this place home. While looking back in my archives for photos and videos of that day, I kept missing them, because at first glance they appeared just like any other reef.

Yet the sheer amount of resources—financial, scientific, and labor—needed to make it work even on this small scale gives one pause when confronted with the larger problem of reef loss. Moreover, this is a technique applicable primarily to shallow reefs; reefs deeper than 15 meters were not good candidates for this technique, not least because the labor needed to maintain them in early stages becomes exponentially more dangerous and expensive at deeper depths, not to mention that the corals which would thrive at those deeper depths tend to grow and reproduce much more slowly.

Then there were the problematic relationships with the people who lived on the island, as recounted to me by the project's social scientists. Recognizing common means of claiming property, many on the island and in neighboring islands were convinced that the deployment of these artificial reef structures represented a land grab at sea—a means for the corporation to acquire private maritime territory once held in common by the island. The process reminded me of the stories of Serangan. While this time there was no threat of violence or torture, the imbalance of power was not lost on the islanders: How can you say no to the second richest family in the world?

Indeed, one key component of this project was the creation of a strict "no-take" zone around the restoration site; the managers installed a permanent buoy with a sign that read "FISHING FORBIDDEN HERE" that bobbed over the site. The managers argued that this was a necessary measure to allow fish populations to re-bound, including the badly

needed labor of the herbivores, as well as to encourage the residency of groupers and other predatory fish that could eat the Damselfish that liked to "farm" algae on the project site. However, fish are not only delicious, but valuable—potential sources of income; outlawing their exploitation by islanders was no small matter.

The explicit justification for the project was that coral restoration has a direct effect on "food security" in a poorly defined sense—that by restocking the reef with fish, the islanders would suddenly become food secure. However, this assumption was made without evidence; it fails to note, for instance, that fish for most people are not just food, but cash (Vandenberg et al. 2021). Most fish are not eaten, but sold, and the cash is then used to buy rice and other staple foods from markets on the mainland, and to pay for boat fuel and the other stuff of life.

A simpler explanation can also be found: the person leading the project was passionate about coral reefs and marine conservation and wanted to channel Mars resources into a project that aligned with his interests and values. Perhaps coral reef restoration simply needed a billionaire willing to burn through some capital to develop and test effective methods, research and development spending for the future of the ocean. Here we can read the project as participating in a kind of global marine "fantasy production" (Tadiar 2004), where the desire is to live within the narrative that you are saving the earth.

Leaders of the project saw the social scientists' roles as evaluating the degree to which locals comprehended the "food security" justification for the endeavor. The social scientists, unsurprisingly, found that people remained skeptical. The island people were not stupid: they understand perfectly clearly that fish rely on habitat. They simply (and perhaps correctly) doubted that this effort would have any material effect on the fish populations to be found near their island. Besides, in these islands, nobody actually relies on a subsistence diet of local products. Instead, most foods are shipped in from the city. But when one of the social scientists relayed some of their more troubling findings to higher-

ups, they were harassed by corporate representatives who accused them of acting in bad faith, having failed in their job as PR person for the project.

And then there is the bigger question of greenwashing. Mars is well known for operating enormous plantations across much of the global south, contributing to massive deforestation in Indonesia and elsewhere. They have been sued repeatedly by people who say that they were enslaved to produce their products. And more closely to the issue at hand, this conglomerate operates the world's largest pet food producing companies, among whose primary inputs are massive quantities of industrially extracted fish products. No amount of reef restoration can compensate for the damage of that fishing.

I still struggle with the question of what to make of this project. On the one hand, it has helped demonstrate and develop some of the most promising reef restoration techniques known to date. They may yet have real place-based effects, giving new life to dead reefs. On the other hand, those techniques are very unlikely to have a measurable impact on the long-term survival of coral reefs unless they are deployed at unimaginable scale. Regardless, they are not a replacement for solving the primary crisis—climate change and industrial fishing, both issues made significantly worse by the ordinary operations of the parent company. And the project teaches us something important about what it takes to regrow a reef, raising new questions of substitution—what it takes to achieve a kind of recognizable restitution.

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While I am on the site, some of the team members complain to me that the marketing and PR departments at Mars HQ have recently gotten involved, offering unsolicited suggests and making demands. The project, it seems, is good press. It will assist in selling the brand to the skeptical generations who will inherit a planet Mars has helped to set on fire.

But they have some concerns! The modular structures used to construct the reef, which have so far been endearingly called "spiders" due to their vague resemblance to an

arachnid form, need to be re-named—how about "sea stars!" Star is much more palatable than spider—people hate spiders! The second suggestion is that they use the structures to write in the ocean—what, for example, if they spelled out the word "HOPE," in English, on this Indonesian coral reef to which they were not really welcome? The message, after all, isn't for the people on whose waters they are working—but for "the world." I leave, bewildered at the vastness of the value they are milking from this project.

Over a year and a half later, mid-pandemic, one day I am avoiding the stress of life, and mindlessly scrolling on social media, flitting past images which seemed intentionally designed to hurt my feelings, when I come across something that tickles a corner of my brain I had forgotten about. It is a video—an advertisement from Sheeba, the cat food company, a subsidiary of Mars. At first, all I see is the word "HOPE" against a background of tropical blue water. On closer inspection I realize that the word not overlaid over the ocean but is actually *beneath* the water. It is the project site—the reef that I helped scrub clean—sparkling from the gods-eye-view of an overhead drone shot. "They actually did it!" I think to myself; you can vaguely make out the shape of the spiders. As the video slowly pans out, an English accented voice says: "HOPE is on the map. More coral today, more fish tomorrow."

I badly want to believe that we can re-grow the world's coral reefs, despite the many obstacles and significant evidence to the contrary. I want to cling to the idea that we can turn back the clock, put things as they were before—bring back the fish and the corals, and create "food security" for people on small islands. But is HOPE enough? I wonder to myself how much was spent to purchase this advertisement slot on my social media timeline—and how far that might have gone in protecting the coral reefs that we still have left.

"Knowledge is Expensive"

In early 2018, a few months into my research, I was taking the passenger boat that left daily on a circular route connecting Nambowatu and several other small coastal villages to

Kendari. I preferred to sit up top on the roof, to watch the mountains go by and feel the breeze, which is what I was doing when I was approached by a man named Abdul.

Abdul was an old hand in the coral trade, about the same age as Imran. In fact, they worked together for many years. Abdul was part of the first team diving for corals in Kendari, along with Imran and a few others, having joined up in 1999. He and Imran had together trained most of the best divers who worked across Kendari. He took credit for having brought coral collecting to Nambowatu—since that was where he grew up, just a few houses down from Mama and Bapak Eka (he was one of 3 or 4 divers who claimed responsibility for this achievement). Unsurprisingly, he also turned out to family, connected to Mama and Bapak Eka through his grandmother. More recently he's mostly gotten out of diving himself, turning his attention to other ventures. In fact, he tells me, he had just returned from a trip around Maluku where he was scouting out potential places to start a fish or coral business. He explained that he needed to find a place with good reefs and welcoming locals who weren't skeptical of another Sulawesi fishermen with a crazy business idea, and that he would slowly observe them and learn their customs and way of life, and then use his insider status to start his own business. I joked that he sounded like an anthropologist—to which he just smiled.

As we talked, I asked him about the history of the area, and he began to tell me a story about a nonprofit organization called "Yayasan Samudra," or the "Ocean Foundation." The way he told the story was by recalling an event where a huge traditional *pinisi* ship—a traditional wooden ship from South Sulawesi—mysteriously sailed into the bay in Nambowatu. Everyone was shocked and wondered what this boat was doing here and who was aboard. As it got closer, they could see it was full of white people, as well as a man who ran Yayasan Samudra. The year was 2006. This wasn't the last time I would hear about this incident—I got asked about it several times. People would recount the story just as Abdul had—a mysterious ship with unknown motives pulling into the bay—and then they would

ask if I happened to know anything about it? What could they possibly want with us here in Nambowatu?

To this day, the exact purpose of this ship remains elusive, but Abdul noted that it wasn't much later when the village got wind that the government was considering making the waters around the village and the rest of Moramo Bay into a "Kawasan Konservasi," or a conservation area; Abdul and many others considered that perhaps these two events were connected. He explained, "You see, this Pak Dor guy, he wanted to make the bay here like Wakatobi [a nearby national marine park]."

By saying that it was originally Pak Edo's goal to make Moramo Bay the same as "Wakatobi," Abdul meant that they wanted to turn it into a marine park—closing the waters to fishing and marine product collecting, just as they had in the Tukang Besi archipelago which is better known by the portmanteau "Wakatobi." You may recall that this wasn't Nambowatu's first experience with the idea of "conservation area" in its backyard. The entire forested peninsula behind the village had been turned into just such an area, closing the village's land frontier and restricting their rights to access and utilize the resources there—creating a stratified village society and forcing much of the village to turn away from agriculture for its livelihood. Plus, everyone who was part of the densely interconnected coastal worlds of Southeast Sulawesi was well aware of what had happened in Wakatobi once the park was established, having watched it happen and heard about it from friends and relatives who lived there. Wakatobi was a true "conservation is our government now" (West 2006) scenario, co-managed by the Indonesian state with support from WWF. The "authorities" had become heavily involved in regulating fishing practices, equipment, and spatiality, and had foreclosed large swaths of the park to any kind of fishing whatsoever, so called "no take zones." But to do it, Yayasan Samudra would need expert, insider help. After the mysterious ship incident, Pak Dor later came back to the village and

came to Abdul's house and wanted to talk. It quickly emerged that Pak Dor wanted Abdul to become a collaborator.

The plans, according to Abdul, would start with an ambitious project of coral reef restoration and transplantation to revive the reefs of the Moramo Bay. Abdul declined. He said it was clear that Dor only wanted to take his knowledge to benefit himself, leaving him with nothing: "He had the network, he had the power, but he wanted to do coral mariculture, and didn't have the knowledge of how to do it." Abdul, on the other hand, had the knowledge. While working with PT. Cipta, he had spent time in Bali. Rather than laying around and doing tourist stuff the way that others did, he used his time to learn how to mariculture corals, gaining hard earned and secret knowledge and skill. He told me that when he came back to Kendari, his boss was shocked that the company had taught him their proprietary secrets, which were usually jealously guarded and not shared with anyone.

Even though Dor apparently offered him good money, he said no. Abdul told me that he could see that Edo's long-term goal would, in the end, destroy his profession and the fishing and marine product livelihoods of the entire Moramo Bay. These were not fears that he simply dreamed up—they were based on his and others' observations and interpretations of what had happened in Wakatobi. It was a proposition he couldn't agree to, no matter how much money in salary he was offered.

Yayasan Samudra decided to move ahead with the project without his help—in the end they may have enlisted another coral company in Kendari. They organized an effort to transplant a huge amount of coral along the coast. They hired Bajo divers from local islands to do the transplantation work and tried to create a no-take zone just like Abdul had feared, preventing people from fishing there. They spent, in his estimation, more than IDR 1 billion, an astronomical sum that I cannot confirm. But the point Abdul was making was that this was an incredible expenditure of time, money, labor, and organizing for what he could see was a doomed venture.

Abdul said that he told Pak Edo, "If that this coral survives for four months, I will come work for you." But Abdul knew that it would all be dead before that, with nobody to tend to it and take care of it, to remove the algae and clean it up. And he was right: all that money went down the toilet. "How can a tiny coral fragment glued to a piece of cement survive out there without any care? No way. It is definitely gonna be destroyed."

Indeed, after a few months—not yet four—he happened to meet Dor again in Kendari. All the coral was dead. Abdul showed him his own transplanted coral, alive and thriving, explained that they needed tons of work to be cared for every day to survive. Dor re-propositioned him, saying, I will supply the funding, you work and manage it, deal? And Abdul said again, no. He told him this: "I said, it's knowledge [ilmu] that's expensive, Sir. Not money, but knowledge."[109]

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I knew a few other people who had connections to Yayasan Samudra in the past. From what I could gather, the organization seemed to have done a mix of community conservation efforts, outreach, coral transplantation, alternative livelihoods, and assisted scientists with research surveys. It seemed innocuous enough to me—the kind of grassroots organization that was responsible for driving change with relatively meager resources. That is why it was so striking to hear Abdul talk about the organization as a kind of extractive, livelihood stealing beast with deep pockets bent on colonizing physical marine space. One element at play is status and identity—the people who worked for the organization were seen as elites—educated and well connected, able to move easily within the spaces of the state, the university, and the international conservation world. In other words, more similar to the coral bosses than to ordinary people like Abdul, who sat on the other side of the citizenship divide. In this way, like the corporate reef restoration project, it wasn't a big leap to read the situation as another example of a powerful group coming to colonize the ocean.

Part of what Abdul's story—and local responses to the reef restoration project discussed above—demonstrate is that coastal communities often think very differently about the status and meaning of the marine space—of the reefs and fishing grounds that surround their homes. Outsiders come in and think about the oceans as a commons—an ownerless zone that belongs to all. Locals think differently, in the sense that they have rights and privileges, including the right to grant or withhold permission, that do not extend equally to others. I other words, the property and ownership status of the ocean are not as clear as is imagined in either the law or the imagination of outsiders. Forms of ownership and belonging and permission jostle and compete and rub up against one another and are negotiated in real time by those who make homes here. Access to the sea is not a free for all, but rather it is governed by institutions and norms, and anyone who might attempt to abrogate those institutions and close off access to others should be regarded with skepticism.

And if creating a permanent structure in the ocean, such as a serong, confers a kind of ownership on the builder—then it is only natural to be wary of someone erecting hundreds of structures in your backyard before putting up a sign that says "no fishing." It's easy to see why people would read the situation not just as an extractive exploitation of their knowledge, but as a landgrab—or rather, a sea grab (cf. Vandenberg 2020).

Conclusion

Mariculture and reef restoration teach us about the problem of labor and environmental change: namely that loss of functioning ecosystems brings with it a rise in labor demands. As fisheries are depleted, increased labor time is needed to catch the same haul. As weather patterns are disrupted, agriculturalists spend more time caring for crops—irrigating, cultivating, or replanting. Likewise, corals, abstracted into coral farms, require immense labor time to ensure their viability, since humans must replace the work done by every other species on the reef—especially the work done by herbivores and detritovores who

keep algae from overgrowing corals and recycle waste into fixed carbon. A human with a scrub brush doomed to the work that a parrotfish or urchin would have gladly done for free. This is the problem of Anthropocene gap-closing that will continue to haunt us—finding ways to make up for loss.

Indeed, restoration itself is an extended attempt to bridge the gap—a strategy to try to revive into living memory reefs which have been lost. But as restoration practitioners try to make this a reality, they also have a great deal to teach us about economies of permission, and the jostling and contested ways that access to marine space is negotiated. They draw our attention to the question of how communities determine matters of property and belonging at sea, as we saw in the case of both the corporate restoration project, and the erstwhile project in Moramo Bay.

Those stories in turn bring me back to Pulau Serangan, in Bali, where the process seems to have happened inside out: the island was largely stolen out from under the residents—both private land and common property held by the village, and reclamation projects made new land amenable to corporate private property financed by grifted money by the son of the dictator. Yet on the shores of this newly formed private land, at the very edge of property legibility, coral mariculture companies and squatters chase their own dreams of commodity, property, and capital, protected by proscriptions on owning the sea. Coral farms meanwhile do their best to placate the state in their pursuit of permission—biding their time until the gears of the regulatory machine finally come unstuck.

The Serangan story calls into question our very notions of what land and property are, and the ways that permission, power and ownership are mobilized to realize them as economic categories. Indeed, this sticky mess of property, power and belonging—both on land and at sea—is the subject of the next and final chapter.

INTERLUDE
Rushing for Gold

In 2008, gold was discovered in two rivers in Bombana, a regency at the far southern edge of Southeast Sulawesi province. The then Governor Nur Alam (later imprisoned for mining related corruption) "declared the discovery a sign of the grace and blessing of Allah" (Beavis and McWilliam 2018: 295).

This was it! Everyone's chance to get rich. Dozens of men from Nambowatu—including Bapak Eka—dropped everything, packed up their stuff, and headed to Bombana to try their hand at gold panning. At the peak of the rush, they were part of what Bapak Eka described as a "sea of people," tens of thousands who flooded to the normally sparsely inhabited upstream watersheds of the Tahii Ite river, all with a bad case of *deman emas*—gold fever. At the peak, a district which has only about 500 permanent residents was suddenly hosting 60,000 miners as makeshift huts and tents popped up in the fields around the village's river. The spot where the mining took place is easily visible on satellite images as great white streaks upon a green landscape—the lingering scars of a time when anything seemed possible.

These were all so called "artisanal" miners, which is to say, small scale, uncapitalized miners working alone or in small groups, utilizing their own resources and cheap, DIY style practices that they learned from other miners or from the internet—mostly using liquid mercury (which is surprisingly easy to purchase online). The gold they were after—the gold found in Bombana, I learned, was called "Placer" gold—it sounded familiar to me, which is because it derives its name from the Spanish *placer,* a word for alluvial deposits. This is the kind of gold that powered the California rush in the 19th century and gave its name to Placer County. Unlike mining for gold in hard rock deposits, placer gold is about aggregating infinitesimal traces in ancient rivers.

The process is pretty easy: it starts with finding sediment with some gold in it—even a tiny amount is fine. This could be sediment you scoop up from a riverbed. Or if all of that is gone, maybe you use high power water pump to blast a hole deep into the earth—like a pressure washer on steroids. Muddy sediment water is rinsed and decanted to remove the water. Then the sediment is mixed with elemental mercury, liquid at room temperature, which has a special affinity for gold. The mercury readily binds with the gold in the sediment; miniscule gold flakes invisible to the naked eye are sucked into the mercury, which forms an amalgamation. The more gold absorbed in the mercury, the more "solid" the amalgamation becomes; when the ratio skews toward too much mercury, it retains its flexible semi-liquid form, becoming more solid and clay-like as more gold is added. When all the flakes are sucked up, the little ball of gold-saturated-mercury is then heated with a blow torch until the mercury vaporizes, disappearing as toxic gas into the atmosphere. Once you cook off the mercury, you're left with concentrated flecks of pure gold.

The Bombana rush lasted about 4 years, though most of the gold was extracted in the first months. Local officials estimated that billions of rupiah worth of gold were being extracted daily; 1 billion IDR is about 70,000 USD—an inconceivably large sum of money by local standards for a region where the official government poverty line is $25 per month per household. As the easy to find gold in the shallow sediment disappeared, more intensive equipment was brought in—compressors and engines to drill deeper into the riverbeds, and to filter hundreds of gallons of slurry sediment per day—all to extract maybe 1 gram gold (about the size of the fingernail of your pinky).

But even having the gold in hand doesn't do you any good if you can't sell it—any finding someone to pay a fair market rate for gold in Bombana was always a challenge. Many of those who experienced the rush had stories of being cheated, paid a fraction of the value of the gold by unscrupulous buyers. And as the input costs grew—the amount of money you had to spend just to find any gold at all—it quickly stopped being worth it.

Before long, big mining companies began to appear; in Bombana these are the subsidiaries of PT Panca Logam Group, a company with interests in steel and iron production and logistics; they are currently under investigation for allegations of extortion and collusion with local and provincial officials and continue to operate without a mining permit. [110]

In the end few of the artisanal miners found much of anything, and even fewer managed to get rich or garner anything approaching "fortune." Instead, many were injured or killed. The districts water supply was polluted, then exhausted completely. Roads were washed away, and enormous amounts of sediment were flushed downstream, making waterways impassable and destroying fisheries.

And what about all that mercury? Whatever isn't vaporized ends up washing down the streams and rivers, filtering through fluvial swamps before ending up in the ocean. Mangrove swamps in particular are zones of danger: mercury in the swamps encounter anerobic bacteria which produce MeHg, methylmercury from the elemental form; methylmercury is much more toxic than elemental mercury, and is easily biomagnified through the food web: it is absorbed by algae (and other organisms), which are eaten by small fish, which are eaten by larger fish, and so on; in severe cases this can lead to the mercury concentration in fish protein to be up to a million times greater than the surrounding water—and then this fish is eaten by humans. In Bombana it also found its way into local cattle, which are prized livestock in the region (Basri et al. 2017); many fear that it has ended up in the people as well, though nobody in power seems to have bothered to check.[111]

In this case—what causes the boom? The promise of windfall—of fortune. It was a lure strong enough to bring people from every corner of the province and from across the archipelago. Local officials overlooked the law and regulatory regimes that perhaps could have stymied the sea of people, in part because they were outmanned, but also because they didn't want to spoil this unexpected gift for a forgotten corner of Indonesia. Even many of

those who weren't mining were able to glean value from the rush, opening up food stalls or setting up lodging for the influx of people. Plus, it didn't hurt that gold prices in 2008 were on the upswing: at around $1200 per ounce, gold was at its highest point since the early 1980s, when it was seen as a lifeboat to escape monetary inflation.

And what caused the bust? Most say it was the quick exhaustion of the easy gold. Finding the same amount became harder and harder as the shallow sediment was all extracted. When it gets to the point that you are working with four or five others all day in grueling conditions, sometimes with the help of heavy machinery, all to find a gram of gold worth $50, which you must then split 5 ways, most people abandon ship. The work available back home might not be much better, but at least you can be with your people and sleep in your own bed. Afterall, it wasn't ever really about gold—but the promise of the life that gold could bring to those willing to try.

CHAPTER EIGHT
Earth Displacements

The cool concrete floor of Mama and Bapak Eka's house was always the best place for sitting and telling stories. Over the years Bapak Eka had slowly added on and extended the house, pushing the walls outward as his extended family continued to grow—renovations paid for mostly by coral, as well as cashews and the occasional windfall from everyday arbitrage. The house was now dominated by a large open plan main room with high vaulted ceilings and windows that faced onto the Moramo Bay. But more than just adding rooms, the work of making this house also included constructing the land on which it sat—by hand. The house used to be made of wood, and it used to sit on stilts driven into the sandy bed of the intertidal zone. In other words, the spot where I sat used to be ocean. Their house, just like Imran's and every other concrete house in Nambowatu, was built on top of land that they themselves had created—by pushing dirt off the hillside into the sea.

More than just a simple act of economic creativity, this was also an innovative play within fraught economies of permission: it gave Bapak and Mama Eka access to state approved forms of ownership over their home—to the security offered by a piece of paper—that were impossible to achieve when it stood in the ocean. Because you cannot own the ocean, you cannot technically own a home that sits on or in it. But this was no longer the ocean: this was land. And while Mama and Bapak Eka's little plot was tiny—less than 2000 square feet—they were just one small piece in a much larger story busily redrawing the coastlines of Southeast Sulawesi.

Land is on the move across Eastern Indonesia, where a new political economy of moving earth has sprung up, riding waves of foreign capital, industrial deregulation, and massive infrastructural boosterism. The barge and heavy equipment industries are going gangbusters as plantations, mines, ports, and powerplants all vie for the chance to haul

various kinds of dirt from one place to another. This is the industry of Anthropocene modern: liquidating the ground for the generation of new assets. In the process, earth movers have come to dominate the affective rhythm by which the meaning and value of land is debated and determined.

Nowhere is this impact felt more acutely than Southeast Sulawesi, where this new political economy is busy transforming the coast. Indeed, land reclamation projects both big and small are redrawing the shorelines of the province. Around the city of Kendari, state and private coastal development projects are redistributing dirt from the interior to the coast, filling in swamps and building dry land in the ocean. These projects rely on both vast sums of capital and heavy equipment to coax the earth into the water—not to mention the reliance on state violence to coax people from their land.

But you don't need foreign capital or sophisticated machines: one can build a pile with only hands and a watertight canoe. Afterall, the idea of "reclamation" is simple: dump the dirt in the water and you get dry land—what could be easier? For countless coastal communities, many with long histories of displacement and disenfranchisement, such small-potatoes land grabs are the only way to secure a place in this new political economy where land—especially coastal land—has quite suddenly become a scarce and valuable commodity. And between these small-scale land reclamation projects and the gargantuan terraforming impulses of states and mining companies lies a vast middle ground of earth rearranging projects. Small holders and small companies remake unvalorized coastal swamps into shrimp farming pens, while no-bid municipal contracts for construction and reclamation do double duty as both vanity projects and political favors.

Added together, it's clear that land and the coastline aren't what they used to be. At stake is a series of embodied debates about the meaning of land, a multivalent story about the contested travels of ideologies of territoriality and land-as-property, and a deep history of diverse institutions and regimes of use, access, and rights which governed life on

the coasts. In what follows, I explore how these forms of earth displacement are unsettling the meanings and value of land for coastal communities in Southeast Sulawesi, tracking earth displacement and land reclamation stories from the urban, peri-urban, and rural littorals of the provincial capital of Kendari, a city built on a vast swamp. I follow dirt as it moves across different scenes in this political economy, from industrial nickel mining to the cronyism of urban infrastructure contracts to the everyday practices of making new land in coastal villages. In each scene the earth becomes something else, and the meaning of land shifts beneath our feet.

⁂

This final chapter was, somewhat ironically, the first one that I wrote. It began as a way for me to work through and make sense of a visceral feeling that accompanied the start of my research in Kendari, an image I could never shake: the terror of a dump truck rounding a blind curve, barreling down the center line of a two-lane highway, nearly driving you and your motorbike off the road. I had been in Kendari for about three days and so I hadn't yet learned to drive as if I was expecting a truck to appear at any moment—but I learned fast. Indeed, Kendari roads were full of trucks in 2018—especially large dump trucks. You couldn't avoid them—only learn to live with them. But why were there so many? What were these trucks actually *doing*? Answering these questions took me in strange and surprising directions and taught me how to see coastal transformation and the transfiguration of land one dump at a time.

Land is indeed on the move in Eastern Indonesia—often in the bed of a dump truck. In Kendari it's hard to miss; even from indoors you can feel a constant rumbling of the ground as trucks barrel through, loaded with red soil, circulating like clotted blood, speeding along every potted roadway, every alley, hurling themselves down every corridor slashed through the swamp or the forest, kicking up clouds of red dust, the particulate matter of getting rich quick. Indeed, the trucks made the city, and they made the city

possible: Kendari sits on the fluvial plane of 15 slow rivers and streams which wind from the hills before spilling out into the muddy bay once filled with schooling trevally, crabs, and shrimp. The base of the bay all the way to the foothills was once wetland alive with birdsong, and mangroves tapered the edge of the sea to a brackish gradient. Then the trucks brought the earth to fill it in.

The trucks all carry earth, but the earth is not all the same. Some is rock—split stone or gravel or limestone, some is powdery sand, some is boulders, clay, some is coal. Some is the product or waste of other businesses—nickel mining mostly—though much of it is just earth, taken from one hole to fill in another. The trucks—and bulldozers and excavators—arrived in the 2010's, at the tail end of the long commodity super-cycle when mineral prices were on the way up post-recession, and heavy machines spread out over the province. Ever since, Kendari has been in a perpetual diesel shortage—queues stretch down long streets—drivers park their trucks and leave for a nap and meal, saving their place in line. Even when the government banned raw mineral exports in 2014 just as the super cycle deflated and mineral prices fell, the trucks remained behind. Some rusted in abandoned concessions, but most were put to new uses—hauling sand for construction, landfill for reclamation, or leased to the growing oil palm sector to haul fruit.

Drivers are paid by the load—pushing them to drive ever faster, clipping rear view mirrors from parked cars and sending rocks flying through windshields and open doors, mowing down motorbikes and regular bikes on their way to move the earth.[112] Along certain stretches of road, every family has a story of someone coming face to face with a truck in a hurry. As they plow along, the trucks also crush the roads underfoot. New asphalt must be admired immediately, because it will not last long beneath the incessant weight of earth moving. And when the roads become so pitted, cracked and broken that they start to actually break the trucks, more trucks are sent with gravel to fill and level the roads, which repaved, allow the trucks to continue on.

In the 1930s and 40s, Komatsu and Hino were leading suppliers of heavy machines and weapons to the Japanese military. Post-war they pivoted to forest, field, and mine, following Japanese capital to the resource frontiers of Southeast Asia. Lime green Hino trucks and banana yellow Komatsu bulldozers and excavators are today found everywhere, and these heavy machines have become the symbolic lodestones of the new political economy. For industry boosters the trucks are evidence of the march of modernity, and heavy machinery sales are a weathervane for mineral prices. But for many communities seeking to retain control of their own resources, they might as well be tanks.

Indeed, the scene sometimes feels like war. In 2018, Imran and other divers told me about what they heard from villagers who lived in a small coastal village on the other side of the Tanjung Peropa peninsula. They often travelled there to dive on the surrounding reefs and would spend the night moored at the village jetty, where they would shoot the breeze with the locals. That's how they learned that the land around a neighboring village was cursed by high nickel content in its soils. And because the villagers lacked the right kinds of pieces of paper that could document their historic ownership of the land in question, the provincial government declared it to be state property—and awarded a mining concession to a privately owned nickel mining company backed by Chinese foreign investment capital. Both individually owned land and village common land was transferred to the company; in some cases, individual land ownership was annulled by appeals to minor bureaucratic errors in the handling of paperwork. Villagers were furious. When the company tried to send trucks, excavators, and bulldozers to the new site to begin work, fishermen in wooden canoes surrounded the barge, and in the middle of the sea, formed a barricade. It seemed to be working—until the mining company opened fire with live ammunition, shooting one of the fishermen. The machines were landed under the gun of state security, the land expropriated.

⁂

Land is never one thing. It is slippery, always shifting in meaning, both undeniably concrete and undeniably constructed (Li 2014b; Tsing 2002). Scholars have long been interested in the ability of power to reconfigure the meaning of land—through enclosure and exclusion, and through access and control (Hall et al. 2011; Polanyi 1944; Ribot and Peluso 2003; Thompson 1975). Most classical analyses of how power reshapes land focus on questions of enclosure and expropriation—what Derek Hall, Phillip Hirsch, and Tania Li (2011) helpfully parse as "powers of exclusion." On the flip side, Jesse Ribot and Nancy Peluso (2003) offer a theory of what they term "access", which is not the right but the *ability* to benefit from something—especially land. Notions of access and exclusion show how the power of states and markets can reshape our understanding of what land is and who may benefit from it. Still, the state and the market have never had exclusive domain over land's meaning. As Anna Tsing (2002: 95) writes in her analysis of customary land law in Indonesia,

> A history of property is always a history of shifting contests over meaning and power in which the textualization and enforcement of particular property concepts are only tentatively confirmed. To study this instability is to acknowledge cultural and political legacies, yet admit that one does not yet know the outcome—or even the outline—of the unfolding story.

The question of what land is and who may access or own it is never fully settled. Indeed, who would have predicted a response to exclusion would be a village level movement to build new land in the intertidal zone? Here we need to think about land's materiality in a more specific way.

The classic substantivist position on land, first laid out by Karl Polanyi (1944), cites land's material qualities as the factor that distinguishes it from real commodities; while commodities, Polanyi argues, are objects produced for sale on the market, land is just another word for nature (Polanyi 1944:75). As Tania Li (2014b: 589) writes, "land is not like a mat: you cannot roll it up and take it away," drawing on a metaphor used by

smallholders in India protesting expropriation from their lands. While a mat is portable, able to be taken away by forces of market or violence, land is substantively different: "land stays in place. It is excludable and can be partitioned, but it cannot be removed" (Li 2014b: 591).

But is land reducible to the abstract space it occupies? Or do the specific material qualities of a given plot dictate its potential affordances—the richness of the soil or the high nickel content of the substrate or the mucky invertebrate ecologies which provide abundant shellfish harvest? Consider Kristina Lyons' (2020) ethnography of soil care in Colombia: here it is the particular types of composition, decomposition, and multispecies relations which constitute a plot and dictate its potentiality and possibilities; land with different soil regimes becomes something new. If you scoop out the earth from a given plot, leaving a gaping wound, is this still the same land? If you dump that same earth into the ocean—have you moved the land? Made new land? Rolled it up like a mat and taken it away? In this new political economy of moving earth, the stability, presence, and location of land is in trouble.

What is happening in Kendari is a new kind of land market—not just the buying and selling of abstract space, but a traffic in the material qualities of land itself, coupled with a quest to create new land out of whole cloth. Land reclamation becomes a technique for generating assets—the logical conclusion of a property regime in which any random plot of abstract space can be considered land—so long as it is dry.

How to think about the obligate dryness of land? In his romantic history of Dutch land-making practices *Dredge, Drain, Reclaim*, Johan van Veen (1948) argues for the centrality of land and water management policies in the history of Dutch capitalism—even that it enabled Dutch settlers to spread across the coasts of Europe to colonize the marginal wetlands of the North Sea. Likewise, in her account of logistics and austerity along the Hooghly River, Laura Bear (2014) shows us the consequences of declining attention to the

materiality of the riverbed—rivers filled with sediment boycott their interpellation in circuits of capital. Laura Ogden's *Swamplife* is another good place to think through the making and meaning of land; much of the everglades was made investible through drainage—one of the principle ways to sort out land from water—but the landscape never escapes legacies of criminal and ecological recalcitrance which continues to challenge hegemonic notions of what the land is and means (see also Ghosh 2016).

But what about land on the move? Two scholars in particular have helped me to think about the mobility of earth as a form of political economy. First, in his ethnography of desertification in China, Jerry Zee (2017) shows how land as sand becomes mobile in uncontrollable ways, especially as wind born aerosols which travel the globe, prompting new experiments in governance from the Chinese state trying to hold the dessert at bay. Likewise, in her ethnography of militarism and counterinsurgency in Iraq, Kali Rubaii (2018) tracks how communities in Anbar province negotiate and survive the violent rearrangement of their landscape. Rubaii's careful ethnography of infrastructure shows how the redistribution of earth as concrete is and remains one of the key expressions of power, violence, and militarism reshaping life and death in Iraq, Palestine, and beyond. The checkpoint and the modular concrete wall—both shape and control life, remaking channels of power across the region.

Focusing on cases of moving earth might show us two things about land. First, it shows us the mutability of the physical characteristics of any given plot of abstract space to the point of unrecognizability; fertile fields become barren wastelands beneath the excavator, while brackish swamps become dry and stable piles of sediment—fit for laying concrete slabs and little else. This mutability matters because struggles over access and exclusion are always about particular or potential material configurations of the land—not simply about abstract space. If those material qualities are transformed beyond recognition, it is almost as if the land has been rolled up and taken away. Second, land in

its abstract, mobile conception allows for a kind of legal originality and opportunism on the part of small communities usually crushed under the gears of Anthropocene industrialism; if the state and the city and the shrimp farm can make bona fide new land from nothing, then they can too.

The Mines

In December 2022, I read a news story that Indonesia has begun to lobby for the creation of a multilateral OPEC-like group to control the world's supply of nickel. Where OPEC dictates many rules of the game in the fossil economy, in the coming energy transition—the electrification of everything—control over nickel deposits will be like controlling oil. This because nickel is a key component in battery construction and chemistry—and will likely continue to grow as the transition to electric everything accelerates, driving rapid growth in demand for batteries. Nickel has the virtue of being both relatively energy dense and relatively abundant compared to other minerals used in batteries; there is more than twice as much Nickel in the earth's crust as all the Lithium and Cobalt combined. Yet Nickel is still relatively rare—making up just 0.0084% of the materials that compose our planet. And the world's largest deposits of this precious metal are found in Indonesia—especially eastern Indonesia, and especially Sulawesi.

Where there is nickel, there is usually iron—and nickel-rich iron, called "ferronickel," is a highly desirable mineral source of power. Sulawesi's long history as a source of this potent metal is right there in the name:

Sula Besi; Island of Iron. The region's rich deposits of high-quality iron ores have been exploited for at least 2000 years by indigenous smiths who worked the earth into all manner of goods—tools, weapons, nails—which circulated widely across the archipelago, generating power and wealth in their movements and travels (Adhityatama et al. 2022). The deposits around the montane Lake Matano were especially prized, having among the highest quality nickel-rich ores in the region. These iron deposits helped birth many old

kingdoms of the region, including Luwu, Tobungku, and Banggai, whose abilities to either control access to the resources or to expertly put them into trade circulation was the source of immense power for centuries. The iron in turn became central to the construction of power in far off kingdoms, including being a key supplier of the ancient Javanese empire of Majapahit (Adhityatama et al. 2022; Velthoen 2002: 63).

By the time of the VOC in the 17th century, among the main sources of this iron was the Kingdom of Tobungku north of present day Kendari, not far from the present site of the largest nickel mining and smelting operations in the country. Tobungku swords were circulated far and wide, and the kingdom exported ironworks from the neighboring Matano Lake district. Turning this iron into valuable objects—weapons and tools—became a regional specialty, giving Wakatobi its old name: the Tukang Besi archipelago, or the "Iron Smith Islands."

The 17th century Dutch naturalist Rumphius (1999 [1705]) wrote about the many different kinds of iron and metal that were to be found in circulation in the archipelago, including highlighting the skill of the Lake Matano smiths who knew how to work local ores such "that it almost becomes steel" (Rumphius 1999: 238). But in addition to iron weapons, Rumphius wrote about so called "thunderstones" and "thunder shovels" in his magnum opus *The Ambonese Curiosity Cabinet*. Since antiquity, Europeans who had come across ancient stone tools—unaware of the possibility that they were made by ancient humans—regarded these objects as divine; ancient Romans used them as protective talismans, while in other parts of Europe they were venerated as incarnations of spirits or deities. By the early modern period, they had come to be called "thunderstones" (smaller metal tools) and "thunder shovels." (elaborately worked tools like metal axe heads). Their name came from the scientific consensus at the time that they were formed, as Rumphius explained, by lightning zapping "metallic and earthy vapors" in the atmosphere, causing the precipitation of the objects, which the lightening then hurled toward earth.

Rumphius reasoned that their resemblance to human-made objects was because humans had originally learned their technology from God, "the Astral Smith," who "could also make such tools in the Thunder fire that he commands, without the aid of human hands" (Rumphius 1999: 246). This divine (even astral) origin imbued the objects with magical powers—especially making soldiers invincible in war. He described a report from an Imam who wore a thunderstone on a belt for protection: "he was once hit by a musket ball during the Madjerasensian war, precisely on the spot where he wore the stone, and he fell, but neither he nor the cloth that was wrapped around the stone, was harmed in any way." (Rumphius 1999: 242). He even claimed that Arung Palakka himself—the Bugis prince who joined the Dutch to conquer Makassar—relied on a "thunder shovel" for protection, "and he never seems to have been hurt, though he made many bold attacks on the Enemy in full view of our Dutch officers, attacking the Enemy partially clothed, only armed with a small shield, a saber, and a short spear" (Rumphius 1999: 248).

Rumphius was apparently close friends with the King of Tobungku, who supplied him with thunder stones and shovels for his examination, and he reported that Tobungku warriors always wore these objects into battle, which aided in their success in raiding and subduing their neighbors, such as the Sultanate of Buton. Given their proximity to ancient sites of mining and metalworking (Adhityatama et al. 2022), it is not surprising that such artifacts might be in great abundance. But regardless, the stones and shovels—these pieces of ancient, perhaps divine, ferronickel—were key to their projection of power and economic dominance.

The power of Tobungku was long forgotten in the region, but today the exact site of the former kingdom is once again becoming a great center of power built around the control of rare and precious metals. On Monday August 8, 2022, Luhut Pandjaitan, Indonesia's Coordinating Minister for Maritime Affairs and Investment announced on Indonesian television that electric car manufacturer Tesla had agreed to purchase US $5

Billion worth of nickel from Indonesia during the next five years. Tesla agreed to work with nickel processing companies in the Morowali Industrial Park, located north of Kendari; a thunder-stone's throw from the site of Benteng Fafontofure, the ancient fortress of the Kingdom of Tobungku. The park is a joint venture between the Indonesian private company Bintang Delapan Group and Chinese metals giant Tsingshan Holding Group. The park is a small city-state unto itself, with a workforce of over 40,000 people, a mix of Chinese nationals and Indonesian citizens. Today the site produces nickel rich iron alloys historically used mostly for steel—but which are increasingly being used for higher tech uses, like electric car batteries. Recent estimates suggest that this park produces around 50% of all nickel products in Indonesia; Tesla's car batteries are composed of up to 80% nickel.

And like Tobungku, centralized forms of violence have been central to controlling this source of power. In Morowali, for years the rumor was that the Indonesian partner, Bintang Delapan Group, which means "Eight Stars," in Indonesia, was run by the military. A 2014 news report from Mongabay when the company was setting up shop in Morowali quotes one local man: "Police and soldiers are hanging around a lot. I heard that the Eight Stars belonged to Eight Generals. We don't know for sure, but everyone knows that this company belongs to the generals" (Paino and Saturi 2014).

The Mongabay report continues:

> The ownership of the shares of the Bintang Eight Group, among others, is held by several generals. Not surprisingly, the people of Morowali know this company as the mine of the generals. There is Lieutenant General (retired) Sintong Panjaitan, sitting as president commissioner of the Eight Star Group. Sulawesi is no stranger to this general. From August 1964 to February 1965, at that time the rank of Lieutenant General, Panjaitan was assigned to destroy DI/TII led by Abdul Kahar Muzakkar in South and Southeast Sulawesi. Almost 50 years after that, he is again involved in Southeast Sulawesi, but in a much different role. In Southeast Sulawesi, Konawe, Panjaitan, to be precise, is now the owner of thousands of hectares of the Bintang Eight mining area.

Panjaitan, now in his 80s, also played a key role in the 1965 Military Coup that took over the Indonesian state; on September 30 he led the platoon that took over the Radio Republic Indonesia, handing over the airwaves to broadcast Suharto's propaganda, and then led troops across Central Java in the slaughter of leftists. He has also been accused of involvement in war crimes in Papua, as well as in East Timor, including the 1991 Santa Cruz Cemetery Massacre in which the Indonesian military massacred over 250 civilians—an event caught on tape by US journalists Amy Goodman and Alan Nairn, who survived the attack.

> "There is also Major General (retired) Hendardji Supandji, as president commissioner of Bintang Delapan Investama, a subsidiary of Bintang Delapan Group. He is the younger brother of Hendarman Supandji, the head of the National Land Agency, and the older brother of the Governor of Lemhannas [a government agency], Budi Susilo Soepandji."

The article doesn't mention that Hendarji's older brother Hendarman was not just head of the National Land Agency (BPN) from 2012-2015, an agency that would have been central to the permit acquisition for Bintang Delapan Group, but before this he was also Attorney General of Indonesia. Family ties help consolidate power.

This is just the latest round of military skirmishes to control these mineral deposits. The Dutch began to develop mining in this region in the early 20th century—but were interrupted by the onset of World War II and Japanese occupation (Robinson 1986). Japan took over the mines, redirecting the material to its own war efforts. Following the end of the war, the mines were the subject of intense fighting during the DI/TII rebellions—the "time of the gangs" discussed in Chapter 5 (see Robinson 1986 for more). After the beginning of the New Order regime, these mines were seized by the central government, and by the late 1960s contracts for exploration and mining development were granted to foreign mining companies operating with locally registered subsidiaries—the most important of which was INCO, the International Nickel Company, founded in Canada in

1902, later purchased by Brazilian mining giant Vale—the world's largest producer of both iron and nickel.

However, the real boom for mining nickel began in the early 2000s, riding waves of construction and urban expansion across Asia. Among its many uses, nickel is one of the key ingredients in steel, including steel beams, rebar, and stainless. Most of the world's nickel is locked away in the bright yellow, red, and orange laterite soils of the tropics—with Sulawesi boasting the planet's largest deposits. Sulawesi's laterite soils were produced by the island's bizarre tectonic history of plate collisions which pushed ultramafic rocks from the earth's mantle to the surface, forming mineral rich bedrocks. After millions of years of exposure to the high humidity, rain, and heat of the tropics, these rocks break down, oxidizing to bright reds, oranges, and yellows rich in iron, aluminum, and sometimes, nickel (van der Ent et al. 2013).

Mining laterite is relatively easy—you just strip off the top layer of vegetation and scoop out the dirt—in Indonesia, tens of millions of tons each year. But moving this earth is of course extremely expensive; the sheer weight requires tremendous force, so it is convenient to build mines near or directly on the coast, where the soil can be pushed onto enormous barges and floated abroad for the smelters of China—41 million tons of it in 2013 alone.[113] When the monsoons come they too move the earth, washing it into the ocean in great red plumes which spread for many kilometers first as a thick cloud, and further away as a thin dust trapped in the surface tension. My coral diver friends lament that many of their favorite reefs—places to collect amazing corals with never-before-seen colors are now buried by the runoff, the latest subtidal victims of the political economy of moving earth.

For decades under the autocrat Suharto and his New Order machine, foreign capitalists and firms had direct access to Indonesia's resources for the price of kickbacks to the regime. After the fall of the New Order, political decentralization and resource

nationalism became governmental imperatives. Reeling from the recession induced collapse of nickel prices in 2009, the former Indonesian president Susilo Bambang Yudhoyono (known as "SBY") introduced a new law to ban raw mineral exports beginning in 2014—part of an effort to force foreign capital, particularly from China, to invest in industrializing Indonesia's mineral sector by building smelters and other onshore processing technology. The mining world thought Indonesia was bluffing, and nobody invested, not believing the state would willingly forgo the juicy revenues from export tariffs (Wharburton 2017). Clearly, they underestimated state commitments: the ban took effect in 2014 to the shock of the mining world, and nickel mining slowed to a trickle while Chinese investors began to begrudgingly build their smelters. But when state owned mining companies began to suffer, SBY's successor Joko Widodo (Jokowi) re-opened exports in 2017, before abruptly reversing, announcing a new ban on exports of raw nickel ore, which began January 1st, 2020.

The ongoing controversy of the export ban is about Indonesia's place in a world system of mineral extraction where exporters of raw ore see little of the monetary value accrue locally. More specifically, the controversy is over the question of smelting. Because the nickel is at low concentrations in the dirt, it must be cooked to a concentrate in giant ovens called "smelters." The earth is funneled into huge metal tube-like drums 50 or 100 meters long where it is dehydrated in a rotary dryer to remove water, then roasted in a rotating kiln to separate the minerals, before being cooked a final time with carbon (anthracite) and with calcium (lime) to separate the iron and nickel from their other earthly traces. The result is usually a low-grade mix of "ferro-nickel" or "nickel pig iron," which is used in producing cheap steel and rebar. The smelting process requires an extreme amount of energy, mostly from coal, another kind of earth which is shipped in by the barge from Kalimantan and dumped in crude in-house furnaces. In other cases, smelters tap into local power networks, and quasi-public-private powerplants are built for the largest smelters. In

Kendari—a city where the power turns on and off seemingly at random, rumor and speculation travel fast that outages are caused by greedy miners overdrawing the grid.

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My friend Irma tells me that her employer, a "mining services" company in Kendari, saw 1000% growth in revenue in just one year. I'd known Irma just as a casual acquaintance who helped me get to know the city when I first arrived. Only later did I turn to her to help me understand the province's mining sector—a seemingly far cry from my research on marine product economies. I tried to explain: "I've started to really get interested in the nickel mining stuff because," I start, but Irma finishes my sentence: "Because now it's gotten *crazy*."

Irma is young, in her mid-20s, a recent university graduate who works in the HR side of things, doing staffing for mining operations who contract with her company. Irma was late to our meeting and arrived frustrated after having been kept waiting for hours at the doctor for her annual exam. Her company forces all its employees to get an annual checkup including a chest x-ray for workers who might be even briefly exposed to the swirling red dusts of the mines. The precautions of her employer speak volumes about the bodily uncertainties which come with the mine and its mechanical contingents. But there are few other options available: "For young people in Kendari, this is the job that's available." Many of her peers with university degrees in finance or literature work as laborers in the mines because that's all that's available.

Irma's field, "Mining Services," is a funny term for all the catchall stuff that mines don't want to do themselves. Her company does soil testing to examine nickel concentrations, tests refined ore, hires staff for big clients, and even certifies the seaworthiness of ships carrying the dirt. "There are only five mining services companies in Kendari," she tells me. I tell her that I think that sounds like a lot—how many services could possibly be needed by the few big companies in operation? She smiles—"you don't

understand, there are *thousands* of small mining companies across Southeast Sulawesi." I had assumed that regional mining meant of a handful of huge strip mines with thousands of employees—but this is not the whole story. Irma's company alone has hundreds of clients, most of them small operators. The feeding chain works like this:

A large mining company backed by substantial capital and political clout will be granted a letter of permission known as an IUP[114] to mine a certain area. They don't own this land, but if they happen to come into possession of it, they are free to exploit it. However, most will mine only a small portion of their allotment, preferring to rent or lease rights to the remainder of the concession to small operators, many of them just a few dudes, an excavator, and a truck. She gave me an example. The Harita Group—a media, palm oil, and mining empire run by one of Indonesia's wealthiest families—had managed to get their hands on a lucrative permit for mining on the small island of Wawonii a few hours off the coast of Kendari—Imran's home island. The IUP was enormous, covering three districts—or almost half of the area of the island. The plan was to establish a small mine, build a jetty for export, and attract contractors to exploit the remaining resources.

Wawonii is home to thousands of smallholder agriculturalists growing coconuts, cloves, and cashews, many or most of whom lack official state recognized land certificates, relying instead on their established orchards as proof of ownership. But without a state issued title, your land falls into a legal gray zone, and can often be sold from beneath you, trees or no trees. The mining companies came in the night to clear away decades-old gardens under the protection of the state police and military. Wawonii residents had been fighting mining on their island for years and descended en masse to the capital in protest. Students staged a die-in and mock burial, lying in cardboard coffins while they were slowly buried by bags of dirt. Two days later, protestors marched on the governor's mansion. The police response was so violent that Irma—halfway across the city—was ambiently teargassed on her way to work. A middle-aged woman who was beaten by the police later

spoke to reporters from her hospital bed saying: "We will die a slow death if our land is mined. Better to die at a demonstration in Kendari."

A few months later, in 2019, protests erupted across Indonesia against parliamentary plans to enact a draconian new criminal code and to reduce the power of the national anti-corruption commission—which had recently jailed numerous Southeast Sulawesi politicians for big-ticket mining bribes. Southeast Sulawesi residents brought the protest to the governor's mansion and the provincial house of representatives in Kendari, stapling national concerns to their own consistent critique of provincial corruption. On September 26, the government beat and opened fire on protestors, killing two Halu Oleo University students—Randi, 21, and Yusuf Kardawi, 19, who died literally defending the soil of the province. While symbolizing state commitments to violence and impunity, their deaths also galvanized a movement in Southeast Sulawesi that refuses to concede another inch of land.

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One could argue that such shows of violence in the service of protecting foreign capital are attractive to investors. Convinced by the government's commitments to nickel, and enticed by the gap in domestic smelting capacity, a Chinese company called Virtue Dragon Nickel moved into Southeast Sulawesi opening both its own mine and a billion-dollar smelter with a container ship sized jetty to boot. Irma tells me that their nickel isn't very good quality, but that they are becoming one of the biggest players by cornering the market in smelting and make good money renting out their industrial jetty to other mines.

By late 2018, after the closure of the coral trade had dragged on for over 6 months, many coral divers in Nambowatu were struggling to get by. Some, like Imran, were able to keep working collecting ornamental fish. But many others who didn't own their own boats or equipment had no such alternative. They were out of work, and out of money.

When I came back to visit in 2019, the village was eerily quiet. Many of the divers, it turns out, had given up and migrated to the mines in search of work—especially to Virtue Dragon Nickel. Yet even these menial labor jobs are not easy to get. If you don't have a high school diploma, as is the case for most divers, the task is even harder. My friend Rizal, a coral diver, told me about his experience. To get hired you have to go into debt to bribe the recruiters—so many people are hungry for the jobs that they are willing to pay just to shovel coal. The salary is just a few hundred dollars per month—but if you're caught violating safety protocols, such as not having your shirt buttoned properly, your pay is docked as much as 20% for weeks or months on end. Between the bribe to get hired, the jacked-up rent in local dormitories, and these pay cuts, many workers struggle to break even. It feels like debt bondage—like a form of enslavement. Meanwhile, the company gets subsidies and tax breaks for "employing" local residents.

The effects of the seesawing mineral export ban were radical in Southeast Sulawesi as capital flooded the province, and then retreated, only to flood again a few years later. The uncertainty mostly favored smaller operations—local elites able to massage permits and land rights—who parasitized on the heft and capital of a few big companies and worked to generate the aura of a rush with its fantasy of equal opportunity riches for anyone precocious enough to try. Since the first waves of the Sulawesi nickel boom, rumors have circulated in which ordinary citizens become fabulously wealthy when their land turns out to be sitting atop rich nickel deposits—a kind of Indonesian Beverly Hillbillies phantasmagoria. But in real life, nickel is a threat to anyone whose livelihood isn't backed up by a thick wallet and a thick stack of certificates proving ownership in the eyes of the state.

But these stories only worked for the elite who had ensured iron-clad legal documentation of their landholdings—especially those who arrived from outside the province as speculators. And in most cases land was leased, not purchased, and so emergent

forms of rent seeking behavior transformed the meaning and value of land. Land and jobs came and went. Community based institutions of ownership and access were bulldozed by state directives to secure foreign investments. Earth moved back and forth, but mostly offshore—hundreds of millions of tons from backhoe to barge, floated abroad, never to be seen again.

Draining the Swamp

"At least it's kind of nice that they have the mangroves there in front of the hotels," I said to a student I met at a local scuba diving club. We had just finished what remains the worst dive of my life across a nearshore coral reef an hour north of the city—within the fallout zone of one major industrial nickel mine. The reef was hazy, dead, and green, smothered by silt and algae—a casualty of the new regimes of sedimentation which have taken over almost every coastal waterway in the province. We were discussing coastal change, as one does while swimming back to shore, when I mentioned my surprise at seeing a small mangrove forest along Kendari's main waterfront where the city's fancy hotels were concentrated. He and his friends laughed before he offered, "yes, it is surprising because 10 years ago the hotels *were* mangroves."

It took me months to fully realize that I was living on the bones of dried-up swamp. In retrospect this is embarrassing, but I was preoccupied at the time—I was here for coral, not for land reclamation or nickel mining or wetland destruction. Eventually I found a room to rent in a historic part of town and connected with Imran and the divers of Nambowatu. But before that, in the first days of my time in Kendari, I was by day desperately trying to get in touch with coral divers, farmers, and exporters, and by night coming home to the inky silence of an aging print shop on what used to be the city's outskirts.

Kendari had become a quintessential resource boom town, sometimes growing 10 or 20% each year as people flocked in from every corner of the province. The city was originally little more than a colonial trading depot at the mouth of a teardrop shaped bay;

as it spread, it moved westward into the swamps and wetlands formed where many rivers and streams emptied into the sea—swamps which would need to be drained and filled for the city to continue to grow.

In the print shop I was generously hosted by a Bugis family from another province who had set up shop in Kendari and started to move some of their family members to the area, exploiting relatively low land prices and opportunities for business accompanying the growing city. You may recall from Chapter 3 that the patriarch of the family told me one night after dinner that they had come to Kendari because the Bugis—an ethnic group famous for entrepreneurship—are "hungry for land." Members of their extended family opened a printing business, some dormitories, a coffee shop, minimarkets, and few other small businesses, mostly concentrated around the area of greatest urban growth in the Southwest corner of the city—the former alluvial wetlands between the Wanggu and Kambu rivers. And they weren't alone.

In the 1990s, Southeast Sulawesi's leading public university, Halu Oleo University, responded to rapidly growing demand for enrollment by relocating to what was then essentially a giant swamp on the outskirts of town, not far from the print shop. The massive concentration of students—over 40,000 undergraduates alone—helped to grow a secondary center of gravity for the city. Dormitories, hotels, coffee shops, cafes, and every other imaginable business popped up along the roadsides of urban expansion. As the city swelled, it brought its dirt along to fill in the swampy holes.

At the print shop, my street had all the qualities of a place which used to be peri-urban before being swallowed by the expanding city; the road was too wide and plied all night by heavy trucks and muffler-less motorcycles. The mosquitos were legion and fierce. But most tellingly was the red dust. It came in with your shoes, dissolved in the water pumped up from the building's well, and seemed to float in through every crack in the building. As I learned about Southeast Sulawesi's booming mining industry, I wondered if

the dust was blowing in from distant open strips—which may well have been the case. But closer to home I came to realize that the ground on which the printshop was built was itself landfill. The ground outside was more like a loose pile of dust than anything resembling soil or land. Its ephemerality was made clear by the ease with which it became airborne. Indeed, it felt as if half of the ground was always lingering in the air.

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Kendari's expansion owes a great deal to its commitment to filling in the swamp, as well as to a longstanding tradition of political clientelism. After the fall of Suharto and the call to decentralize state authority, the control of local government became an endless game of king of the hill (Hadiz 2010). A few years in office was enough to enrich yourself and your family, and public works projects, of which there are a never-ending supply in a city built on a swamp, provide the means.

A local friend who works as a political pollster explained it to me: in exchange for campaign donations, elected politicians will issue no-bid construction contracts to their backers. In most cases, the contractor will then proceed to build the project with cut corners, pocketing the bulk of the funds as profit, maybe with a kickback to the politician. Perhaps the contractor was family, in which case, even better. Sometimes the projects would themselves become commodities, bought and sold among contractors on speculation. In other cases, the contractor might just pocket the funds and skip town. Deals were made at a famous local coffee shop with a sign out front that read: "Want to become Mayor? Governor? Regency Head? Member of congress? Drink coffee here." This place was frequented by men of all levels of society, a purveyor of the dream of masculinist cross-class mobility. Deals here could be done in the open.

In this way, the city continually expanded and grew both through ordinary infrastructure and more stupendous projects—a floating mosque offshore, a new bridge spanning the mouth of the bay, and a brand-new container port. Each of these projects does

double, or even triple duty, as political vanity project, as kick-backs to the political machine, and as infrastructural taps to the pipes of capital flowing from both the central government and foreign investors eager to bolster Kendari's role as entrepot to Southeast Sulawesi's earthen resources—nickel, oil palm, asphalt, gold, and other forms of dirt as commodity.

Consider the bridge. Bridges have long served as infrastructural showpieces and vanity projects in Indonesia, a visible display of mobile force and connectivity, proof of achievements against the scorecard of modernity. In the 1960s Indonesia's first president Sukarno dreamed of an iconic vertical lift crossing equal in grandeur to the London Tower Bridge. The bridge across the Musi River in Palembang, South Sumatra, would be a reminder that power still came from controlling the riverine nodes between hill country and open sea (cf. B. Andaya 1993; Kathirithamby-Wells 1993). As wealth flowed through the river on a cargo barge, the bridge would part itself, a hydraulic sentry of postcolonial industry to come. Paid for by Japanese war reparations and originally named for Sukarno, the project was not enough to secure the president's legacy; just hours after the opening ceremony on September 30, 1965, Sukarno was forced from office in a coup. Under Suharto's new regime, the bridge was re-named "Ampera," a catchy abbreviation for "Amanat Penderitaan Rakyat," or "the mandate of the people's suffering."

Still, for coastal cities across Indonesia, bridges and ports have become key indicators of municipal flourishing, and cities dealing with the complex geography of coastal areas are fond of erecting showy bridges to make their skylines distinct and noticeable. The situation is no different in Kendari. Near the print shop a small concrete bridge spanned the Wanggu river, connecting the former swamps of the southwest of town to the older part of Kendari city. This two-lane bridge was a choke point for traffic to Kendari's outer fringes, so the city granted a contract to build a new one. The new bridge, which was only a few hundred feet long, took almost 5 years to build, involving multiple failed contracts. Rather than a simple expansion, the city saw this as the perfect

opportunity for a vanity project, building an elaborate double bridge with huge yellow arches spanning its length. However, while arches or suspension cables usually serve a function, these colossal concrete arches were purely decorative, made of concrete, sitting heavily on top of the bridge like awkward crowns. These ornaments generated prestige for the politicians responsible and drove up the billable value of the project for the succession of contractors involved in its construction. Once, chatting with a taxi driver taking me home while we were stuck in traffic caused by the bridge, I remarked about the apparent pointlessness of the arches. He responded with biting sarcasm: "No, no, they're very useful if you need something to jump from." Mandate of the people's suffering indeed.

But the Wanggu bridge is insignificant compared to the main course of infrastructural development in Kendari: the Kendari Bay Bridge and Kendari Newport. According to a press release from the state-owned company, PT. PP, who is building the project, the bridge will be the third longest in Indonesia. The company boasts of record-breaking design time; where traditional design methods would require long phases of drafting, blueprinting, and public consultation a new piece of software let them do it in less than 1 month. This rapid pace was a selling point: this bridge was so modern that it was basically designed by computers with as little human consideration as possible.

When the project was announced in 2016 locals protested the design: the onramp required the demolition of all historic buildings in the old center and the displacement of hundreds of residents. Less audible still were the voices of concerned researchers who had been studying the rapid sedimentation of the bay. The bridge design, which includes 3 enormous concrete support bases, will cause an exponential growth in sediment retention in the bay, killing off the local water taxi industry at the same time. But the other notable feature of the bridge is that no ship of any serious size will be able to pass beneath it: the historic port of Kendari will be pressed out of existence by silt from below and concrete from above. I haven't been back to see it, but I'm told the bridge is now open.

The Kendari Bay Bridge connects the oldest part of Kendari, called "Kota Lama," to the other side of the bay, only swallowed by the city in the last decade. What was once an island of mangroves, reefs, and communities living in the intertidal zone has become "Kendari New Port," a massive container port and industrial park completely transformed by reclamation. This port might be called aspirational—it is currently far larger than required for the volume of ships that visit still out-of-the-way Kendari. But its gargantuan size speaks to the dreams of the city's boosters, who hope it will become an important node in cosmopolitan circuits of capital, political clout, and masculine valor.

Kendari Newport and the Kendari Bay Bridge tap into the seemingly endless streams of capital flowing from the federal government and private industry—part of the Jokowi administrations' big push for infrastructure. Jokowi calls this push "*Tol Laut*," or "maritime toll roads." Indeed, in Kendari the federal government is footing only about half the bill, incentivizing local government and private industry to do the rest with the promise of extracting lucrative rents from the finished projects—like docking fees, cargo handling charges, and on the bridge, toll booths.

This rapid industrialization is a mixed bag for land speculators. One Bugis entrepreneur told me solemnly that he was selling his land near the city, convinced that irreversible toxic pollution would arrive as the powerplants, the port, the mines, and the smelters all came online. His dream of a giant rice plantation near the city was over. But this is the nature of business, he explained, and he was still selling at a tidy profit—industrial development was so hot that his land had nearly doubled in value. Speculation for land's potentiality must be nimble, ready for unforeseen material transformations which remake the land and what is possible for it.

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Not all vanity projects are infrastructural—some are purely monumental, meant to generate prestige or even divine beneficence. It is 2018, and I am walking on water, or more

precisely, walking on a half-completed reclamation project, a soon-to-be parking lot in the middle of Kendari Bay. The parking lot and the long road which connects it to shore are for the Masjid Al Alam—Kendari's new "floating" mosque. It is extremely hot under the dry season sun, and I am nearly run off the road as truck after truck flies by delivering the earth needed to raise the parking lot from the sea. The mosque has been connected to the shore by two roads, forming a loop around a pocket of mangroves and small stream. Mangrove seedlings float from the swamp and lodge themselves in the boulders which armor the sides of the road, and sprout—a sign of rapid land advancements.

I stop to speak to a worker who is resting in the shade of a rainbow umbrella. As we chat, he tells me that his parents were relocated to Kendari as transmigrants in the 1970s—promised land if they moved. They were given a small plot near the current location of the mayor's office in what was then a vast estuarine salt marsh interspersed with shifting flood plains. Thousands of them together turned the swamps into productive rice paddies and fishponds—and as the city swelled, they eventually sold their land or were evicted by eminent domain. On the swamps of the worker's childhood home there now stands a 100m tower, usually called "MTQ," short for "Musabaqah Tilawatil Quran," the name given to national Quran recitation competitions—an event which Kendari hosted in 2006. Ground broke in 2004, ahead of the competition, but the project wasn't completed until 2018 as contracts became political favors across a decade of election cycles. Once a tapestry of wetlands, the three kilometers of land between MTQ and the floating mosque is today mostly dry, an index of reclamation histories cataloguing the city's march to sea.

A year later, in June of 2019, Kendari was up to its neck in water. The Wanggu river had burst its banks again, washing away homes and displacing thousands of people. Almost immediately, Laode Muhammad Syarif, a Southeast Sulawesi native and then Deputy Chairman of the national Corruption Eradication Commission (KPK), suggested that the flooding should be attributed to rampant land clearing upstream, especially for mining,

which increases the sediment load of the river, causing it to become shallower each year. Indeed, each year just three of the rivers which empty into the Kendari bay—the Wanggu, the Kambu, and the Mandonga deposit 1.3 million cubic meters of sediment; some reports suggest that the Kendari bay is now losing 20cm of depth each year, and these figures are already out of date estimates. Yet it is also true that the loss of the surrounding wetlands and the move away from building stilted houses means that when a river does flood its banks, there is nowhere for the water to go but into the homes of vulnerable communities. Displaced earth displaces water, which in turn displaces people.

One local folk etymology for the name "Kendari" is the Tolaki word "kandal," the stick you use to propel a canoe in shallow water—a fitting name for an ever shallower and increasingly unnavigable waterway. Soon perhaps only those nimble canoes will be able to cross the bay without getting stuck—and it won't be long after that when the bay becomes dry land, and the floating mosque once again comes ashore.

Land Title, Intertidal

The first time Imran arrived to Nambowatu looking for ornamental fish for the aquarium trade, he wondered how anyone could possibly live there. I could imagine his surprise: Nambowatu is little more than a row of houses squeezed between a steep rocky hillside and a murky bay, without room to grow much of anything, let alone build a village. Indeed, land-based communities usually lack the creativity of coastal dwellers to see past the false binary between "land" and "sea." The coast is in-between, a gradient of earth and water which slowly fade into one another, giving rise to diverse habitats and ecosystems each with their own challenges and opportunities. How to make a home in such a place?

Vernacular architecture and technology solved the problems of how to live on mudflats and reefs by placing stilted houses in the intertidal zone. In the mangroves, seagrass, and mudflats at your doorstep are shellfish, crabs, and shallow reefs ripe with shoals of fish, urchins, octopus, lobster. Indeed, the productivity of these coastal

ecosystems was the primary reason living here was so easy. Mangrove wood is ideal as a fuel, leaves of nipa palms are used to make woven roof tiles, and swamp loving sago palms provided the traditional local starch. Houses were built from hard woods from the hilly forest, topped with long-sloping thatched roofs, and floored with wide spaced planks which let cool sea air circulate; when modern concrete and zinc houses become unbearably hot in the noonday sun, stilted sea houses remain pleasantly cool. Meanwhile, the brackish and intertidal floor of this system was literally crawling with life: fish, sea cucumbers, crabs, and dozens of varieties of shellfish. When the tide is low, and there is no wind, communities go "meti-meti"—foraging for intertidal critters like mussels, oysters, octopus, sea cucumber, crabs, and giant clams.

But the problem with a house in the intertidal zone is that you cannot own the land that sits beneath it—because it is not, strictly speaking, land. In an era where coastal development is happening at a rapid pace, where land markets grow overnight, where villagers are being evicted and shot for mining leases, and where state sponsored coastal projects are reshaping entire shorelines, not having the security of a land title is a scary situation in which to find yourself. Villagers needed documentation so they could qualify for lines of credit—in part to make up from the decline in fisheries productivity. Combined with government sponsored programs subsidizing cement home construction (which require a foundation of solid land), the depletion of construction quality wood from nearby forests, and the sudden availability of cheap landfill, the pressure to play the game of land reclamation becomes overwhelming.

Thanks to the new political economy of moving earth, dirt for landfill is extremely cheap; 150,000 rupiah (about $10) for an entire dump truck of sand, a bit more for gravel, and maybe double for expensive split stone. First you make a ring around the plot with stones—bought or collected, it doesn't matter. Then you pile up more stones in the middle, and finally you fill it in with dirt. Voila—land. It works like magic, conjuring up stable state-

recognizable assets for communities long disenfranchised. But in the process of making their rights legible to the state, the coastal habitat changes permanently.

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Indonesia's land ownership laws are complex to say the least. While post-independence reforms sought to adjust uneven distributions of land under Dutch rule, they didn't question the basic assumptions about private property land ownership on which the Dutch legal system was based. In the 1960 Basic Agrarian Law, which remains the supreme land law in Indonesia, a bewildering diversity of land permit types are introduced. In addition to simple "ownership," there are rights of exploitation, rights of use, rights of lease, and several more. The permitting process is onerous, particularly for rural communities who may not have the necessary paperwork to assert a legal claim, and even if they do, are often required to pay from their own pocket the travelling expenses for surveyors to visit and inspect their parcel. Moreover, these legal frameworks abut with extremely diverse traditions of customary law and everyday norms of land use which often have at least some degree of official state recognition (Peluso 1996; Tsing 2002).

Despite land-centric ideas that the sea is void of property claims, the intertidal is not a free for all. Rather, as we have seen in this dissertation, these near shore waters are replete with diverse local institutions for managing access, use, and rights. Most of these institutions are based on the understanding that a given individual, family, or community has a historically based right of usage, but that anyone may access the reserved space by asking permission. For example, in many cases, villages are able to exert some limited form of control over the waters extending their waterfront, dictating for outsiders which fishing activities are permissible (line fishing, certain forms of nets, etc.) and which are forbidden (bombing, cyanide, etc.). In other cases, it takes the form of claims upon the outsider's catch: sure, you can throw a bomb here, but you have to share some of your catch, and don't be surprised when we swoop in to grab some of it right from under your nose.

Consider the *serong*, the fish fence, that has appeared several times in preceding chapters. Although located squarely offshore, serongs exert a form of property claim which remains in effect as long as the serong is cared for and the materials remain in place. The family which owns the serong has control, but with permission anyone can collect the fish from it, and no permission is needed to fish *nearby* the serong—however bombing, cyanide, and other techniques which would disturb the serong itself or the fish aggregated therein are not permitted. Similar rules apply to *karamba*, pens used to raise marine life in mariculture. Institutions abound, and access is a socially embedded process of negotiation.

The same system of permission also governs informal ritual institutions—like the one in which Imran requests permission from the sea guardian spirits before diving. Other nearby villages even recognize entire land and seascapes as off limits—even passing through or near these seascapes might warrant tossing a whole live chicken overboard as an offering. Failure to obtain permission, or a breach of the terms laid forth, such as taking a resource for which permission was not given or which belonged specifically to the spirits, might result in grave peril or death. This echoes agricultural practices common across Southeast Sulawesi. As Blair Palmer (2013) writes of Buton, land ownership is less about exclusive access, and more about recognition of "a responsibility of care." She continues:

> Since the [spirits] own/control particular places, anyone passing through or using these places must act respectfully towards the spirits, including rendering offerings (of betel nut, tobacco, and particular types of foods), or risk punishment. Failing to give appropriate offerings will render [the spirits] angry. A farmer harvesting crops is taking something from a realm controlled by the spirits, and so must render a tribute to the spirits in order to placate them (Palmer 2013: 206).

Permission based rights are a form of informal institution which allows community members to make claims on one another's successes, as well as an attempt at negotiating a form of economic parity with outsiders who exploit community resources. However, as we have seen, this system is vulnerable to power; anyone with power over you might easily compel a gift or a claim.

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In a village I'll call Laikatahi, about an hour south of Kendari, houses which once sat on the shore are now hundreds of meters inland. Previously the entire community was just a few stilted houses along a patch of sandy seagrass next to a small mangrove forest at the estuary of minor river. After reclamation, the seagrass meadow has become a plane of sickly grey mud. The crabs are gone, and so are most of the birds. Because it is located on the mainland of Sulawesi, connected to the province by a major highway, and because of nearby stone mines, in Laikatahi, earth is abundant and cheap. When someone decides to reclaim a plot all they do is call in a dump truck to unload a pile of earth, which is then carried to the site for reclamation, or if the truck can get close enough, dumped straight into the sea.

Imran's brother-in-law, Armin, moved here years ago when he got married, extending the reach of the family coral business across the bay. Armin's home is still on stilts in the water, but he tells me how he plans to fill in his plot the moment he can. Because of the closure to the coral fishery, his reclamation plans have been postponed. His wife, Dita, was born and raised in Laikatahi and remembers watching the sediment change. When she was a girl, the sand was full of seagrass, shellfish, seahorses, and other critters. Today it is a thick, dark mud which sucks into itself everything it touches. Her diagnosis of the change is twofold: First, the new "land" made from reclamation leaches into the water, as does a rush of sediment washed down through the nearby stream thanks to land clearing in the hills. However, second, and just as important to the equation, is the way that the new land reconfigures the hydrology and flow of water across the village. In particular, a massive new earthen jetty built by a cement company next to the village has radically altered the sedimentation patterns, trapping silt and debris in an eddy at the mouth of the village.

Armin built a little verandah on the side of his house where we have coffee. He is no legal expert but patiently tries to walk me through the legal maze in which the village is currently wandering. All Indonesian citizens should have the right to own their land, but in

practice this right is unevenly distributed, in part due to the logistical nightmares of arranging formal titling, including footing the cost for surveyors to map and measure the plot. A normal house on normal dry land is, with luck, money, and some paperwork to prove provenance, theoretically entitled to a "Certificate of Ownership"[115], which represents a fully realized instantiation of land-as-commodity. This is the gold standard toward which the villagers are striving—an ironclad green booklet which verifies their home as a stable and state recognized asset. However, this certificate is not available for houses in the water, which the state deems is un-ownable.

Instead, villagers with stilted houses are eligible for other pieces of paper—such as a certificate of the right to "use" their own home, or in other cases, a kind of semi-official letter from the village head attesting to their ownership of the plot in question. According to Armin, these pieces of paper can stand for ownership certificates when it comes to trying to commoditize your plot. Armin has a letter like this—from the village level. I asked, him, hypothetically speaking, if he wanted to move, could he sell his house? Yes. What if he decided to take the house with him—to dismantle the wood and move it back to his hometown and build a house there—could he sell the plot on which his house was built, even though it was just water? Also yes. What if he wanted to extend his house—to build a new room on the back (which is presently just shallow water unconnected to land)? This, he says, he cannot do. Even though the plot behind his house is just water, someone has already bought it. Even here a kind of speculative market for land's potentiality is remaking the coastline. Forget the land frontier—even the water frontier is closing in Laikatahi.

Figures 39 and 40: The trucks, the “floating” mosque, and industrial reclamation in action.

Figures 41 and 42: Piecemeal land reclamation in Nambowatu.

In Nambowatu, reachable only by boat, making new land is done the old-fashioned way—with a canoe and sometimes with a shovel. The first step is the same—to build a stone ring or a wall around the plot to be filled in. This is done either with locally collected stone which is naturally laminated and breaks off in convenient flat and rectangular chunks, or with coral or reef stone pulled out of the waters in front of the village. Villagers spend hours or whole days loading stones into small canoes and floating them back and forth across the bay, sometimes raiding the rocky outcroppings of neighboring villages. Once you have your stones, you can stack them to build a wall—just a simple rectangle to stabilize the new land will do. Once you have a wall built, all that's left is to fill it in with anything you have to hand—stones, trash, shells. After it is roughly "full," a final addition of earth shoveled off the hillside fills the gaps and brings the pile to a final earthlike shape (figure 6).

Much of the village's reclamation activity relies on state money in the form of "village funds," a program of direct cash infusion to village governments which has become a signature pillar of Jokowi's administration. Village funds are substantial; in 2018 the amount given to Nambowatu was over IDR 1 billion to support infrastructure and other village projects. In Nambowatu, a significant portion of these funds are used to pay villagers to build seawalls to protect against the increasingly unpredictable wave action from more frequent storms. Where large scale village reclamation projects might raise eyebrows at the federal level, seawalls are seen as perfectly legitimate uses of state funds—even if the implicit goal is a subsidized jumpstart on building new land (see figure 5). In this way Nambowatu alone has converted about 35,000 square meters of coastal habitat to dry land—or put differently, Nambowatu has moved about 175,000 cubic meters of earth. When multiplied across the hundreds of coastal villages throughout the province, the potential loss of coastal systems becomes striking.

These projects are done one at a time, kin-helping-kin to get their land. One day in 2018, I had just come back from diving on the reef at the end of the village. I was dripping saltwater as I walked home, stopping to warm myself in the afternoon sun with some of the neighbors. A group of older women were unloading a canoe of coral stone gathered at low tide—fodder for the new plot of land they were slowly building which would extend their yard far out to sea. My elderly neighbor, Mama Devi, stacked the stones in neat layers, taking care that the pile rose in even keel. This would be her family's land—the product of several generations of making a living on the edge of the sea. She worked with intensity and meticulousness on the new plot which would more than double their existing land. When I asked her why she was doing it, she laughed and without even turning her head shouted "HOOOO because I have a LOT of grandkids!" Mama Devi shows reclamation—moving earth to make new land—as both relation building and asset building, constructing the foundations of an inheritance which might carry her kin into the future.

Conclusion

Displaced land slides around the east coast of Sulawesi ferried by dump trucks, programs of territorial legibility, and cronyism between local officials and foreign mining capital. The movement of dirt is re-drawing the shorelines in shifts both big and small. In this article I have tried to trace the movement of earth across these contested spaces, showing how they transform both the meaning of land and its material configurations. Latent in this political economy is an obsession with land's potentiality—what it might become or could be. Even patches of seawater are not immune to this form of commodity logic. It's worth trying to think through the way that this focus on potentiality might change the meaning of land under this new regime.

First, the emergence and growth of nickel exploration and mining joined other forms of speculation, transforming the market for land in the province and reaching far beyond the minerals sector to touch every form of land use. This happened in conjunction

with growing oil palm plantations and coastal development projects, which together with mining have taken over enormous swaths of land. The role of both large-scale land purchasing and of leasing schemes has remade ideas of how land is used as property and accessed as a resource and driven the maddening back and forth of the speculative land market. Thanks to the nickel boom, your backwater allotment might turn out to contain endless riches. This is great if you own it, and a curse if you don't. Indeed, it's difficult to conceive of a plot of space beyond this framing in Southeast Sulawesi—it's as if the market is always looming over your shoulder.

Additionally, the political economy of moving earth has *physically* remade enormous swaths of land—both land under the boot of heavy machinery as well as land further downstream, along rivers, floodplains, coastal wetlands, and shorelines themselves, extending far out to sea where the effluence of mine tailings gets caught in the surface tension. This physical transformation comes along with a reassessment of what kinds of material configurations of the earth can count as "land." Or put differently, the distinction between "pile" and "land" seems to be melting away. In many cases these pieces of land have lost all potential for supporting life as soil—they are piles of trash and stone, which come to manifest in physical form the legal ideal of land as pure abstract space—land as static property. In other cases, such as those in coastal villages, merely the potential to become this kind of un-productive abstract space is enough to spur the emergence of a speculative market for land that does not yet exist.

This transformation to the potentiality of land, that is—which parcels of territory have the latent potential to become productive, meaningful assets or even just ownable polygons of abstract space—has the effect of extending the horizon of the category "land" to include all kinds of dubious geographies. Swamp, mangrove forest, and even the sea itself can be land if you try hard enough. The radical forms of speculation necessary to conjure these watery places as "land" speaks to the powerful grip of property ideologies at the

expense of intertidal institutions governing rights of access and use. In the land rush, long histories of coastal lifeways are washed away and buried. Indeed, if a "place" is a spot woven through with histories of habitation, then analyzing earth moving might help us think anew the meaning of dis-placement as the dissolution of place—not only of one thing taking the place of another, of sediment displacing water, of infrastructure displacing habitat, but of places themselves disintegrating, disaggregating, through the violence of material reconfiguration.

I am drawn again and again to the haunting beginning of Tania Li's 2014 essay "What is Land?" in which she recounts an episode from colonial India where villagers protested eviction from their land:

> To the argument 'Your lands have been auctioned for arrears of rent and purchased by another', they replied: 'When a man buys a mat he rolls it up and takes it away; similarly unless the purchaser has rolled up my land and taken it away how can he be said to have purchased them?

Li reminds us that in our conventional sense, people can be removed from land, but land cannot be removed from people: "Land is not like a mat. You cannot roll it up and take it away." Yet reclamation stories like those from Southeast Sulawesi start to unsettle land's fixity. They rearrange the story in a kind of trick mirror where land is purchased, loaded into a truck, and like a mat, rolled out into the sea.

INTERLUDE
A Wind from Wa Kaka

Whenever I returned to Nambowatu after more than a few days away, people would greet me by saying things like "We thought you forgot about us!" or "Turns out you remembered!" Likewise, when I would leave, the final goodbye was always the imperative "Janganko lupa Nambowatu!" "Don't you forget Nambowatu!"—by which was meant, "come back." Similarly, when someone moved away and never came back to visit, people said "Oh they've already forgotten us." Neither a phone call, nor a package sent by courier (though welcome) counted for this purpose—only when they set foot in Nambowatu again would people say that they "remembered."

Over time I came to think of acts of remembering and forgetting as more than just question of ideational imagery—whether you could recall something mattered to nobody. What good is it for you to picture us in your mind if you never bother to visit? Instead, what mattered was action and presence; a materiality of both remembering and forgetting. You can only "remember" something by doing it—and by corollary you "forget" things when they disappear. It was in this context that people said there was something magical in the water here—once you got a taste, you could never truly forget; fate would always bring you back to Nambowatu.

In this way memory is a form of loose cyclical time where the past must be re-enacted, reproduced, reified. I found this way of thinking about memory elsewhere in Southeast Sulawesi as well. A few brief stories from the island of Buton—one old, and one new—help to illustrate.

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After a few months in Kendari, I began renting a room near the historic center of town, in the relatively wealthy neighborhood of Kemaraya. My simple room had only a bed and a

desk but looked out on a beautiful courtyard garden filled with lush plants, and I would stay there when I wasn't in Nambowatu.

Among the benefits of this wonderful place was getting to talk to Ibu Ana, who came by every few days to sweep the already clean floors. Ibu Ana had an air of uncommon prestige; indeed, she was an "orang keraton," or a "palace person," shorthand for those descended from the Butonese nobility, so named because traditionally they lived within the walls of the great palace in Baubau city. She had moved to Kendari about 10 years prior so that her daughters could attend school in the big city, where they would have an easier time being admitted to the local university.

"Oh, I have many professions!" she told me one morning. "I am also tukang urut [traditional masseuse]. I get calls to do my work all over the city, at the fanciest hotels, people from Jakarta, from Baubau, from all over, they call me." That's how she came to know my landlady, Ibu Siti—as her masseuse. "Sometimes you need to fix a broken bone or to get that tension out of your neck. I'm the best!" She didn't normally accept cleaning work—but since she was here anyway, and since she was close with Ibu Siti, she made an exception. Besides, she enjoyed the calm, almost parklike atmosphere of the compound—and was free to harvest as many herbs and medicinal plants as she liked.

I would stop writing, and she would stop cleaning, and we would drink tea and she would tell me stories about the history of everything.

> "Everything has a history in Buton, and in Buton there are many histories!" But, she warned, "You can't get these stories from just anyone, you have to get them from the people who lived it! Don't trust any newcomers to give you the story. That will just be empty talk—because they weren't there to see it!"

To understand things, she explained, you need to go back to the beginning of the world, when everything was just water.

> "You know that Muna island and Buton island are siblings, right?—Muna the elder, and Buton younger. Before this world was dry, there was a Stone on Muna, called "kontuno Muna," which was the first stone to emerge from the world, and on

> Buton was the second stone, the Batu Popaua, right at the spot where the High Mosque is now. There is a hole there, a hole in the spot that stuck up from the ocean. It was only a small hole, the size if you touch your pointer fingers and thumbs and stretch them to a circle, but it was so deep that anything that went inside could never return.
>
> When we were little girls, we would go play near that hole and we would call into it and it would echo like a cave, and those calls could be heard all the way in Mecca. That's right! The call to prayer [azan] in Mecca could be heard through our hole, and the azan from the High Mosque of the Palace of Buton could be heard all the way in Mecca, and also in Ternate. But once, somebody, a child, went into the hole and never came out. He saw his mother and father in the darkness, calling to him, waving their hands for him to come, so he went inside, even though it wasn't big enough, he somehow fit in, and then never came back. After that they locked the doors."

The stone through which the child disappeared and through which the Buton Palace is connected directly to Mecca, the Batu Popaua, is the most important place in the world—the spot where the first ruler of Buton, Wa Kaka emerged from the earth.[116]

Wa Kaka was the first Raja of Buton. One day (tradition says late 13th century) a hunter was in the woods with his dog; his dog was barking incessantly at a strange stand of yellow bamboo. The hunter fetched a local shaman, who sensed that inside the bamboo was a human, and when they split it open, out came a woman so beautiful she was able to crush and dominate all the men around her. She came to be called Wa Kaka.[117] Wa Kaka became Raja, King, and formed the Butonese empire, which she ruled for 34 years. Eventually, a prince from the Javanese empire of Majapahit, named Sibatara, arrived to Buton—and Wa Kaka took him as a husband; eventually they had 7 children. However, one day she found out that Sibatara had taken another wife in secret. Enraged, Wa Kaka decided to return to heaven with six of her children; the seventh, her daughter Bulawambona became King, and her mother returned to heaven, leaving the country in mourning. Subsequent rules all traced their genealogy to Wa Kaka.

For eight centuries the rulers of Buton were anointed in a ritual that took place at the spot where Wa Kaka emerged. The stone came to be called Batu Popaua (meaning "parasol"), named for the coronation ceremony, where the ruler would slip each foot, one at a time, into the hole, while the sacred parasol was spun overhead. In the 16th century, tradition has it that a man named La Kilaponto—a great, great, great, great grandson of Wa Kaka—defeated a great Tobelo pirate invasion and saved Buton, becoming "the last Raja, and the first Sultan" after he converted to Islam and became Sultan Murhum. He had a grand mosque built on the site of the Batu Papaua—the Mesjid Agung that still stands today.

Memory persisted for another 400 years. But the turmoil of the mid-20th century—war, occupation, revolution, and rebellion—had taken its toll. The situation grew worse in 1960 with the official end of the Sultanate of Buton as the ancient kingdom was absorbed politically by the nascent Indonesian republic, and the sacred mythology of the sultanate supplanted by the secular symbology of revolution. A few years later, in 1964, the provincial capital was moved to Kendari; power, wealth, and memory continued to drain away from Buton. The palace and the mosque became neglected. Disrepair crept in, Ibu Ana told me. That's when the wind came:

> "It was around 1976—I was in elementary school. Back then the mosque was neglected. For over a year nobody prayed in it at all. Everyone just prayed at home. It was falling apart! The roof! The roof was full of holes, leaking. It was filthy! Full of spiders!
>
> Finally, one night there came a heavy wind! A strooong wind. And that roof, it went flying! Lifted from the mosque! It flew all around the city of Baubau.
>
> Who made it travel? It was her! She was angry: Wa Kaka. Because it was her that started it! She was angry because nobody was caring for it anymore. It was so dirty. Spiderwebs everywhere! The point is, everyone ignored it, you know? Nobody cared. Everyone just prayed at home—only on Lebaran would they sometimes go to the mosque, and even then, not the full five prayers. Everyone just prayed at home. People forgot.

> So finally, it came—that *wiiiind*. It knocked down all the trees, and that roof went flying around the whole city. Afterwards the 8 caretakers of the palace came together, and they realized 'The one to whom it belongs, the one who built the mosque, who raised the flag of Buton—she is mad." And so, to this day it is kept updated [diperbarui]. Since then, they keep it good.

Here the "forgetting" is manifested as disregard and disrepair—the forgetting to take care and protect and maintain. Ibu Ana used the word "diperbarui" to describe the upkeep of the mosque after the wind—a word that literally means "renew," or "renovate." It is to maintain the memory of the past by constantly renewing it in the present. To care is to remember and to maintain—to remember is to make new over and over again.

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Ibu Ana's story and interpretation helped me to understand an episode in my research from a few months earlier. In June 2018, I travelled with a few European scientist colleagues to North Buton for some preliminary field surveys around the city of Ereke, the site of the former polity of Kulisusu—its own small kingdom and vassal state under the rulership of the Sultanate of Buton. This was the place that the English pirate William Dampier visited in 1687 from Chapter 5.

Our field surveys were fruitless, so the team spent one afternoon visiting the Benteng Lipu-Wa Pala, the ruins of a great 16th or 17th century fortress that served as evidence of the place's former glory. One of the palace guardians, himself of royal descent, took us around—we saw ancient wells and fortifications and 17th century cannons and the graves of many leaders. Finally, near the end of the tour, he proudly and solemnly showed us a tiny wooden house on stilts, probably less than 2 square meters on the inside. This, he explained, was the house of the spirits—home to the spirits of all the royal and divine ancestors of the kingdom. Only certain people are allowed to enter—to commune directly with the ancestors who dwell there. Despite its well-kept appearances, the house was many centuries old, perhaps a thousand or more, the man ventured.

As we left, my biologist colleague, married to a gifted architect with skill and interest working with historical homes in Europe, was worried that they had not preserved the house in its original state. Indeed, from a European perspective, the house should have been kept exactly as it was at construction, to honor the artistry and atmosphere of the original design and to demonstrate its age. This is a common, perhaps hegemonic, way of thinking about antiquity—even cleaning the dirt from an old coin is seen as a destructive act that removes the accumulated "history" of the coin's circulation. Think of the home-improvement fetish of pulling up ragged carpet to find original hardwood floors hidden away—returning to a past of historical authenticity. If any repairs are done or materials replaced, they should be as period-perfect as possible—wood from the same kind of trees, stone from the same quarries, hardware from the same molds—to keep the layers of the past neatly separated like a stratified cake.

But the Ereke folks found this position ridiculous: why would we not care for, maintain, and update the most spiritually important building in the world? Surely if I replace the roof and give a fresh coat of paint to my own house, I should do the same for the house of the spirits. Updating the structure was the way that they demonstrated care and ongoing memory; by keeping the house "modern" they were saying that the spirits and ancestors are not relics of a by-gone area, but actively with us today. The house didn't need to be exactly as it was five hundred or a thousand years ago, because it never stopped being home; it just needed to be cared for.

On the same trip, we were shown a small, beautiful karst lake filled with brackish water that was connected to the sea by limestone channels. The lake was mostly devoid of fish, and so when we met a local leader there, he told us of his plan to stock the lake with reef fish that he would collect from the ocean, carry over the land, and release into the lake in order to create a livelihood and food source for the local villagers. As I translated, the biologists in our team were horrified—what if this introduction disturbed the ecological

balance of the lake? They asked me to tell him to reconsider, at least until a proper biological survey could be completed—I tried to awkwardly express their concerns. The local leader replied with surprise—Oh if you say so, I guess we won't do it! But the point was that the lake used to be filled with beautiful reef fish—until one day a few years ago, and nobody knew how, Mozambique Tilapia [mujair, an invasive fish species] got into the lake, and within a few years, the entire lake was dead—totally void of life. The tilapia had eaten all the other fish—and then eaten each other. Repair, restocking the lake, was an act of reincarnating the abundance of the past—of showing care, of repairing harm, of renewal. When the fish were restored, people would then remember.

⁂

This idea of memory's materiality created a framework for me to think about the ways that both economic and environmental change had reshaped life in Nambowatu, and for understanding the significance of ecological loss, where a vanished environmental process or ecological community meant that those things were forgotten. For instance, people talked about how the red rice has been "forgotten," and only to be remembered through the acts of planting, tending, and harvesting, or when you taste it again. Likewise, fish: not just specific species or kinds of fish, but the feeling of eating as much fish as you wanted without fear of running out or depriving others. Old tastes, sounds, smells, feelings, and ways of doing things were forgotten not because nobody could call them forth in their mind, but because they no longer existed phenomenologically in the present.

It was this idea that led me to think about the forms of intensification in Nambowatu as forms of remembering; intensification is the work of keeping up with the ever-receding past, of finding ways to invoke it into the present. The bomb, the compressor, and other techniques of intensification—are the only ways to conjure up sufficient catches that keep the feeling of ease and abundance of the past alive in the present, even as they contribute to the accelerating speed at which that same past falls away.

The decline changes the calculus of fortune completely and utterly. You can't understand the diving compressor or the bomb without understanding this story of defaunation. And you can't understand how fish that were once called "trash" are now fit for princely feasts at expensive seafood restaurants, or how quasi-proletariat coastal settlers become roped into something as crazy as the live coral trade. The ordinary becomes rare; the mundane becomes precious: this is fortune's decay. Abundance, wealth, fortune is a quickly fading memory.

This problem of memory indexes the problem of "shifting baselines"—of running for mackerel—from the opening pages of this dissertation, where each generation's encounter with the living world creates its own set of expectations of how things are and should be. Shifting baselines and the forgetting that comes with it limits our ability to comprehend the profound forms of loss occurring all around us. In this, the people of Nambowatu are not alone: forgetting is a problem for all of us, no matter our position.

The Nambowatu injunction not to forget comes then as a challenge: not just to memorialize the world that we are losing, but to remember it by keeping it materially alive in the present, and by working to restore what has been lost, returning the world to itself over and over.

CONCLUSION
Looking for Fortune

What does it take to get by in a world that keeps falling apart? Among the greatest losses in our current moment of relentless change are the long taken-for-granted gifts of cycle, predictability, and pattern that shaped how people have lived and interacted with the earth since time before memory (Ghosh 2016; see also Nyquist 2019; Livingston 2020). Old friends—the seasons, the rains, an annual migration of fish—become estranged. Without these, every day we face the world anew, pushed to constantly learn and relearn the fickle temperaments of a planet we no longer recognize, even as those who still remember work to restore the lost cycles and stories. This requires immense, almost Sisyphean, dedication and fortitude (e.g. Vaughn 2017; Zee 2022). It also requires creativity.

For decades the idea of "sustainable livelihoods" was a lodestar for conservation and development organizations: finding ways for people to get by that didn't destroy the environment, and in particular finding "alternative livelihoods" to replace ones deemed misaligned with conservation goals. You get the illegal loggers to stop logging by giving them a better alternative: maybe being a tourist guide, or a mushroom farmer. Many such projects failed, often for predictable reasons: they failed to provide sufficient income or were vulnerable to market fluctuations, or they required intensive amounts of time or labor, or they were monotonous or demeaning. Like symbolically transplanted corals, such projects frequently failed due to a lack of ongoing support; one person in central Sulawesi described such a lackluster "micro-enterprises" initiative as being "like chicken shit, a little bit of steam at first but it quickly fizzles out" (quoted in Li 2007: 141). And many such projects were often paternalistic or even nakedly colonial in their ambitions to dictate the terms on which people should live their lives. Indeed, the political ecology and

environmental anthropology literature is full of examples of failed projects and interventions (e.g. Li 2007; Brosius et al. 2005).

But aside from such failed interventions, if "sustainable livelihood" means a patterned, regular, and ongoing way of getting by—a way which can be imagined continuing forever—then the ecological and economic parameters of that kind of sustainability are quickly narrowing. This is not just because attempts at sustainability are starting from the ruins of centuries of colonial and industrial extraction, but because the forms of planetary stability that create the conditions for ongoingness, such as the climate, are quickly eroding. Truly sustainable livelihoods—ways of living that are dependable, secure, and sufficient, are now very rare. The discursive space once occupied by "sustainable livelihoods" in conservation and development is increasingly taken up by ideas like "adaptation" and "resilience," in recognition of how difficult it will be to survive in a world gone off the rails.

And yet the idea of a truly sustainable livelihood—one which you can depend on to provide you with a dignified existence—continues to loom large, a dream, a fantasy increasingly out of reach. As people continue to be dispossessed of their land, and as labor continues to be displaced by mechanization and industrial technology, there are more people lacking a livelihood today than ever before (Li 2014). The sea itself was once an answer to this problem, as we have seen. But today the sea's capacity to support people is being dismantled by industrial extraction and pollution. Meanwhile, the promise of a "politics of distribution" (Ferguson 2015) that might enact a more equitable spreading around of the massive wealth accumulated by that industrial extraction has largely yet to materialize. Even in Nambowatu, where most families benefitted in some way from state subsidies and occasional direct transfers, a dependable way of getting by long term remains hard to imagine. State subsidies and cash infusions do not keep pace with the loss of the "subsidies" or free gifts provided by living ecosystems. On the whole there is a loss which

must be made up—a widening gap that is getting harder and harder to close. Fortune, rejeki, livelihood—remain stubbornly out of reach.

In this context, coral diving has offered itself as an attractive way of living, a choice that makes even more sense when you consider the alternatives that divers were forced to take up during the closure of the coral trade. If you are landless, then the standard options are fishing or collecting other marine products, or turning to dangerous and demeaning wage labor in the mines or plantations or aboard industrial fishing boats—and even those are difficult to get for a villager without a high school diploma, and were overwhelmingly gender restricted. Unsurprisingly, divers hoped to avoid this kind of livelihood—of predictable but very modest incomes in exchange for demeaning, repetitive, and time intensive labor that involved the risk of injury and required living away from home for months or years on end. Of course, there is always bomb fishing—with the promise of easy money, but at the risk of losing your life or your freedom. No wonder people in Nambowatu have become so economically creative—experimenting with fortune in whatever ways they can think of.

Understandably, divers were drawn to a kind of livelihood that offered them a chance at fortune—which provided small windfalls of money for a less intensive kind of labor—even if it came with bodily or financial risk. Coral diving seemed to offer a chance at building a kind of wealth that was usually out of reach for people born into circumstances similar to their own. If you got lucky while farming, you might get a decent price and have food on the table. But if you got lucky while diving, you could get rich: you could improve your life and the material conditions of your entire community. Just imagine if you managed to find a coral like the balloon mushroom! You could turn that single fleshy polyp into a life of ease and leisure. A few divers had even done it: transcended their station in life, become bosses and wealthy men. And aside from the promise of fortune, diving work was interesting—full of adventure—a chance to explore new worlds few had ever seen, to

gather new knowledge, to become a respected and skilled expert who was part of something much bigger. Who could turn down a promise like that?

⁂

This dissertation has explored some of the ways that environmental transformation is remaking economic life along a rapidly changing coastline. I have found that ecological loss has remade labor, rerouted circuits of value, and transformed the very meaning of fortune. By following coral collectors as they scour the shrinking reefs of eastern Indonesia in search of beautiful and rare corals for the global aquarium industry, we've caught glimpses of the many ways that ecological loss is remaking economic life. And along the way, we have met many other kinds of fortune-chasers learning to navigate increasingly unstable worlds in pursuit of a livelihood.

Coral divers and others have shown us that ecological loss creates a gap—a missing piece of a puzzle. The work of economic creativity is to figure out how to work around these missing pieces in the pursuit of fortune, despite everything working against you. New tools like the diving compressor are employed to augment and extend the limits of the human body, or to amplify labor to compensate for declining abundance. New strategies of conjuring credit and capital are devised. New kinds of assets are dreamed up, and new bureaucratic technologies invented, for instance, to turn a pile of mining waste into land. Along the way, economies of permission that threatened to stop you are massaged, skirted, dodged, placated, and tricked.

Here is my argument: in a world after sustainability, economic creativity, in whatever form it takes, is not a choice. It has become a compulsion—without innovating and creating new ways to garner fortune, without constantly keeping yourself prepared and ready for the next opportunity, you will soon be left behind. As they say in Kendari, the "game" is happening with or without you—and the only sure way to lose is not to play.

Figure 43: Imran.

Business as Usual

The coral trade finally re-opened in 2020, after nearly two years of closure. I was excited to return to Indonesia that summer to find out how the dust had settled—to see how things had changed, and how the divers were navigating this new world. But March 2020 and the COVID-19 pandemic changed everything—and I haven't been back to Indonesia since 2019. Because Nambowatu remains without cellphone signal, communication has been difficult. And as I finish writing, I have more questions than ever—more gaps to fill in, more follow-ups to chase. I worry that my friends in Nambowatu think my absence means I have "forgotten" them, and in some important ways, perhaps I have. I won't be able to really "remember" until I return this coming year, 2023, five years after this story first began. It feels difficult, therefore, to write a conclusion to a story whose ending I do not yet know.

Still, a few things are clear. By many accounts, when the trade re-opened it was as if nothing at all had happened. As one observer put it, coral was flowing from all corners of the country again, just "like back in the old days."

In August 2020, Vincent Chalias, a French expatriate aquarist and coral trader based in Bali who set up Indonesia's first coral mariculture farm over 20 years ago, published a short piece on the state of the trade for the popular industry site *Reef Builders*. I haven't met him, but Chalias was well known among the divers in Kendari and regarded as one of the most powerful and well connected people in the coral world—a so called "big boss," a boss's boss—and commanded respect in this role, referred to simply as "Pak Vincent."

Pak Vincent is an advocate of coral farming, and a pioneer in coral mariculture techniques. His vision is of an Indonesia with minimal wild coral collecting, and a vast industry of sustainable coral farming as the primary supplier of the aquarium industry. He recognizes that coral farming is extremely labor intensive, and sees this as a feature, not a bug: the need for lots of labor means the provisioning of jobs in Indonesia—sustainable,

well-paying jobs growing coral for the world. The picture he paints is something like the hoped-for future of organic agriculture, but in the sea. It is a tempting vision.

So it was with some distress that he described the state of the coral trade in August 2020. Apparently during all those months of the coral trade being closed, regulators had been busy revising the process by which coral farms were governed, audited, and monitored. This had completely transformed the political economy of permission: it was now harder than ever to get all your paper together to become a legitimate coral farm in the eyes of the state. This means something coming from a figure like Pak Vincent who is so well connected: if even the big boss is struggling with the new regulatory scheme, what hope was there for everyone else? Meanwhile, it was as if nothing at all happened for the wild coral collectors: that was "business as usual."

Chalias points out the obvious implications here:

> "So now you have [coral] collectors that are being asked to endure a very complicated administrative process to start farming corals but they can trade wild corals with minimum paperwork. This disparity obviously discourages them from farming anything. […] Furthermore, to the benefit of all industry players, wild corals are cheaper and so everyone is happy with the current situation that seems to favor wild coral export. […] Coral farmers can't compete with reef animals that are simply extracted from the bottom of the ocean. The set-up cost, the maintenance of brood stock colonies, and the risk involved of losing them, is just too high, compared to the harvesting cost of wild colonies. If on top of this, the bureaucracy is a lot more burdensome, then you have a perfect recipe for organized failure." (Chalias 2022).

I haven't yet been able to figure out the details of this new permitting system. And while I think Pak Vincent may be simplifying the costs and risks involved in wild coral collection, I understand his point. Indeed, it's hard to imagine a process more cumbersome than the one described to me by coral farmers in Bali in 2019—though one should never underestimate the creativity of policymakers and bureaucrats. And moreover, the motives of this restructuring are difficult to discern from afar. I can't help but ponder the cynical

version: was this another attempt for certain ministry players to cement their role in the permitting process and reproduce their administrative power? Or was the motive more earnest? Perhaps the regulators were aware that coral farms were being used to launder wild caught corals—and the new process was an attempt to make such elisions of their permission more difficult.

These are not mutually exclusive—and regardless of the motive, Chalias's assessment matched one of my early findings: that the only thing separating the ordinary divers and workers in the coral industry from the bosses who hold the permits is the ability to navigate and manage state and financial bureaucracies—to whisper to the state to make the right forms of permission emerge, and to brave the banks to get the kinds of credit and capital that could make these dreams come true. If the new regulations were as onerous as Chalias was implying, then the effect would almost certainly be to entrench this divide even more deeply.

⁂

Thinking through the implications of this assessment brought me back to a moment aboard the *Two Sons*—in that brief window of time when everything was working as it should. The permits had appeared, the compressor had been replaced, the divers were healthy, and the coral season was open. Money was flowing. It was a beautiful, sunny day in April, in the calm time between the west and the east monsoons—the water was warm and crystal clear, and the promise of fortune beckoned.

That day we didn't go far: just to the small island in the bay just offshore of Nambowatu. The crew was saving their fuel for a longer voyage. As we sat in the late morning light, with time for coffee and cigarettes before the dive, sharing jokes and stories, Imran suddenly gestured to the idyllic scene around him. What if we started a diving business here? he asked.

At first, I thought he meant start a coral diving business—to become the boss of his own collecting operation. This was something that he had hinted at before, the desire to get out from under the thumbs of the bosses, managers, and capitalists who held his permits. It was a move that a few others had tried—and a couple had even succeeded with the help of well-connected friends and family.

But this time Imran actually meant something else: he meant a recreational diving business, taking tourists on dives to explore the coral reefs of the Bay of Moramo. "We could transplant coral here and make it good again," he suggested—we could re-grow the reef, make it beautiful, bring back all the fish. No more compressor diving. No more struggling to find disappearing coral. No more weeks at sea away from his family and home. We could build a little headquarters on the island—nobody was using it anyway. Wouldn't that be great?

I had forgotten about this conversation until coming across it years later in my notes; Imran never brought it up again. The moment was fleeting: like a costume tried on, a romantic daydream of a new life. And yet, conjured into the moment by the playful conversation, the dream was now thinkable in a new way—as a possible future.

We kicked the idea back and forth for a while, testing it out, trying to find its limits, what could make it succeed, and what could make it fail. It would be difficult at first—to set up the infrastructure, to get the right kinds of boats, to build places for people to sleep, to buy all the SCUBA equipment and re-train the divers on how to use it, and to get people to come. It would require braving capital and courting the state at every level. But just picture it: sleeping in your own bed every night, diving just for fun, meeting people from all over the world, guarding what was left of the reef and its promise of fortune. We could make Tolaki food for the visitors—they would try Singongi and heirloom red rice and sample all the different kinds of grilled fish and if they came during mango season, or cashew season even, they could join in the juicy rush. The visitors would bring money, and

they would take home little bags of orchard grown turmeric powder and dried strips of sour mango for cooking—to take the taste of Nambowatu with them. They would dust off the *kalo* and find someone to make the village a new gambus and gongs and drums—they would bring back the old music, recite Tolaki *pantun* verse, and host *lulo* dances; if the visitors were too shy to dance, they would drink home-brewed pongasi for some liquid courage. We could show them the leftovers of The War—the bunkers, and if they were brave, they could hike in the forest looking for the wild anoa. They could help care for the baby transplanted corals—and the corals would in turn care for the village. And once they tasted the sweet water from the spring in the mountain, Nambowatu would be in them, and they wouldn't be able to help but come back for another taste. It could be a new chapter for the divers and for the village, a new adventure, a new kind of experiment in fortune.

Eventually the carafe of sweet coffee was emptied, and the cigarettes finished. The image floated quietly there between all of us, the crew of the *Two Sons*, before Imran stood up and began to pull on his wetsuit. "Maybe," he said. Tools in hand, a long hose connecting his lungs to the compressor and to thousands of aquariums around the world, he lingered at the side of the boat for a moment to close his eyes, his ritual of permission, before plunging into the blue. He disappeared below the surface, but the words he whispered in the silence of his heart lingered in the air: "We're all the same: we're all just here together looking for our fortune."

Notes

1 Names of most people, places, and companies, and organizations have been changed to protect privacy, with exceptions for public figures and major organizations.

2 Here I am inspired by many scholars who have expanded our analytic horizons of what might matter in "economic" analysis, including Dipesh Chakrabarty (2000), Lucinda Ramberg (2014), Julie Chu (2010), Sylvia Yanagisako (2002), Alan Klima (2020), Laura Bear (2014) and Lisa Rofel (1999).

3 https://www.wnycstudios.org/podcasts/radiolab/articles/how-important-bee__kw

4 Moore uses language like "the biological capacities and geological distributions" (304) to describe name these extra-human processes of value generation; he also maintains a species-centric position that only human labor generates value (as a specific kind of wealth under capitalism tied to socially necessary labor time). I'm not so wed to orthodox definitions or a secular ontology of value—far be it from me to say what does and doesn't exist and generate value in the world. Plus, is socially necessary labor time not determined in large part by the forms of work that are provided for free by nature? Does the loss of bees not directly transform the quantity of socially necessary labor time required for production?

5 Building from Kathi Weeks' (2011) anti-work political project, Dave argues persuasively against framing the living world in terms of work and against reaffirming the liberal politics of inclusion that reifies the goodness or "ethic" of work.

6 This dynamic is strongly reminiscent of what Moishe Postone (1993) has theorized as the "treadmill effect" of capitalism: ever increasing production chasing a static or shrinking pool of "value."

7 Studies of the impacts of coral fisheries are rare, but all of those of which I am aware came to similar conclusions; see Atkinson et al. 2008. However, while the coral trade is not responsible for reef decline, coral collecting may have impacts on the populations of specific species (see Siringoringo et al. 2021 and Raymakers 2001). Taxonomic confusion within and without the trade makes these difficult to assess.

8 At some point since 2017 the piece was updated on Outside's website; the original year of death, 2016, is now replaced mysterious ellipses. The new opener reads: "The Great Barrier Reef of Australia passed away in … after a long illness. It was 25 million years old." The ellipses mark a suspended immanence of death, a prophecy of fate suspended.

9 For instance, the limestone bedrock in my backyard in Santa Cruz, hundreds of feet above sea level and a mile from the shore, is composed of fossilized marine organisms who secreted the lime to make their shells. I pull the stones from the soil when I find them and use them to make little borders around my vegetable beds. Their calcium degrades and is absorbed by my beans and cucumbers and chiles, helping create study cell walls; I eat the fruit and then the calcium becomes part of me.

10 See: http://www.garf.org/news6p3.html; The reference to the "Prinsenpark Aquarium," may refer to an aquarium inside the hotels or theatres that were part of "Prinsen Park" in colonial Batavia, which was a center of inter-ethnic and inter-cultural arts, theater, and cinema in the late 19th and early 20th centuries, in what is now Lokasari, on Jl. Mangga Besar. More available here: https://indonesiancinematheque.blogspot.com/2020/07/batavia-bioscoop.html

11 See Zhou 2019 for more on this period.

12 Additional images of the aquariums of the Berlin Aquarium Club can be seen here: https://reefbuilders.com/2020/11/02/time-capsule-of-german-mini-reef-aquariums-from-1985/

13 http://www.orafarm.com/product/stuber-stag/. Accessed 15 May 2017

14 CITES, COP 7 (Lausanne, Switzerland, 9-20 October 1989), Prop 49-52 (Proposed by Israel): https://cites.org/sites/default/files/eng/cop/07/prop/E07-Prop-49_to_52_Scleractinia.PDF

15 https://reefbuilders.com/2022/01/03/the-price-and-size-of-frags-in-2013-will-shock-you/

16 Teluk Moramo, or Moramo Bay is also sometimes called “Teluk Laonti,” or the older Dutch colonial era “Staring Bay.”

17 In addition to an ancient place name on Buton Island, “Peropa,” (also spelled “Beropa”) is the name in Butonese languages for the “mangrove apple” (Sonneratia alba), in Indonesian often called the “pedada,” a species of mangrove widespread across the Indo-Pacific which produces a tart, edible fruit. Along with the sympatric mangrove species belonging to genus Avicennia, they grow in sheltered coastal waters; because the sediments in these coastal areas are hypoxic, the trees produce pneumatophores or “breathing roots,” sometimes called “pencil roots” that stick up from the sediment around the trees so the roots can breathe. These two taxa, along with some Rhizophora, dominate the mangrove forests that fringe the peninsula—forests which have been dramatically reduced by harvesting for firewood and clearing for settlement.

18 Peropa, is also a favorite food of the endemic lowland Anoa (Bubalus depressicornis). According to Mustari (2019: 94), they can sometimes be seen at low tide foraging in mangrove forests, enjoying fruits of both Peropa and Avicennia spp. mangroves, as well as leaves and shoots. Famously aggressive and violent, as well as spiritually potent, people are terrified of encountering anoa in the woods. Mustari (2019: 184) disputes their ill temper, describing them as shy, sensitive creatures. He also describes ritual hunting of anoa.

19 Given the widespread use of camera traps in ecological research on endangered mammal populations in Indonesia, such as the Anoa, I’m sure there was truth in their stories.

20 For more on Sama-Bajo livelihoods, cultures, and histories, see Baskara 2016, Lowe 2006, Nolde 2014, and Gaynor 2016.

21 Surat Keputusan Gubernur Sulawesi Tenggara No.98 Tahun 2016.

22 Keputusan Menteri Kelautan Dan Perikanan RI No.22 Tahun 2021. The decree also changed the name from the colonial era “Teluk Staring” to “Teluk Moramo,” named for Moramo district on the bay’s western shore.

23 The same name, ruma-ruma, is sometimes in other parts of Sulawesi for Decapterus russelli, or “Indian Scad;” the two species resemble each other but are not closely related.

24 According to Mead's classification, the Bungku Tolaki languages include: (Bungku Family): Moronene, Taloki, Kulisusu, Koroni, Wawonii, Bungku; (Mori Family): Bahonsuia, Mori Bawah, Padoe, Mori Atas, Tomadino, and (Tolaki Family): Waru, Tolaki, Rahambuu, Kodeoha. According to Donahue's classification, the Buton-Muna languages include: (Munan group): Busoa, Kaimbulawa, Muna, Pancana, and Liabuka; (Buton Group) Cia-Cia, Masiri, Island Cia-Cia, Lasilimu, and Kumbewaha. The Wolio language forms its own group with Wotu. For those languages found in Southeast Sulawesi province, Zobel (2020) suggests a subbranch called "Island Kaili-Wolio" with four languages: Wolio, Kamaru, Kalao, and Loa'/Barang-Barang.

25 Rejeki also appears as “rezeki,” “rajaki,” and other spellings, signaling the diversity of its meanings and origins.

26 For more on rejeki in Bugis contexts, see Acciaioli 1989.

27 The original design of this image is by Elise Stella, called “Finicky Fish,” visible here: https://society6.com/art/217-finicky-fish

28 Indeed, Arabic “rizq” derives from Middle Persian “rozig” meaning “daily bread,” which in modern Farsi is “ruzi” (روزی), deriving from the root of the word for “day,” which is “roz.” Interestingly (but more speculatively) there may also be an etymological link to Sanskrit derived words for bread such as “roti,” and perhaps even Greek derived words for “rice,” (English “rice,” Spanish “arroz,” which borrows from Arabic ʾarruzz, which borrowed from Ancient Greek oruza).

29 I’m grateful to Zahirah Suhaimi for this hadith reference and its relevance to understanding *rizq* and rejekei.

30 The Chinese descent of the student matters to the story: the unspoken implication, drawn from ethnic stereotype, is he is both Rich and non-Muslim; this piece of identifying information is supposed to highlight the bridging of difference in this story—across lines of class, religion, ethnicity, and even humanity.

31 In another version of the story I later heard, the Chinese student was replaced by the owner of a construction supply company in Surabaya who sold rebar, cement, and other building materials, and who had sent hundreds of millions of rupiah worth of product to an address in “Wentira”; she travelled there attempting to return a large sum of cash that had been paid in excess of what was owed. This version of Wentira emphasizes the material, physical qualities of the invisible city—which requires cement and rebar just like every other modern center. But generosity is a common element across both; the djinn from Wentira always pay their debts, plus interest—and they pay in cash.

32 Cf. Klima 2019

33 https://reefbuilders.com/2018/05/04/there-is-no-ban-on-indonesian-corals/

34 The Philippines banned the collection and export of all coral in 1977, though smuggling remained fairly common until at least the 1990s, when crackdowns by US officials seems to have put pressure on the industry in neighboring Indonesia to grow.

35 This kind of inventory accounting is not only necessary to keep track of whose corals are whose and to whom money is owed, but also is mandated by BKSDA as the CITES Management Authority as a tool which in theory could be used to check if companies are adhering to their quota; I doubt these are frequently, if ever, inspected. Indeed, the ledgers are often inscribed with pencil—allowing for retroactive “corrections” should the need arise.

36 "Sudah standar."

37 “Ayo kita bongkar semuanya.”

38 Joshua Barker (2012) noted that in times of political reshuffling, allies would call in sick from work to stay close to the phone, waiting for the president to call, claiming to have AIDS: “Aku Ingin Dihubungi Suharto,” or “I Want to be Called by Suharto.”

39 A 2008 law governing executive branch divisions changed the name of the cabinet divisions from “Department” to “Ministry.”

40 A New Order era acronym jokes (a whole genre unto itself) is that the word for judge, “hakim,” is actually an acronym: “Hubungi Aku Kalau Ingin Menang,” or “call me if you want to win.”

41 Peraturan Menteri Kelautan dan Perikanan Republik Indonesia Nomor 56/PERMEN-KP/2014

42 The wording of the entry is interesting: “Pemanfaatan (Pengambilan) Koral/Karang dari Alam Untuk: Bahan Bangunan/Kapur /Kalsium, dan Souvenir / Perhiasan, Serta Koral Hidup atau Koral Mati (recent death coral) dari Alam.” PerPres 44 2016.

43 “Sekarang nihil.”

44 "Jamur merah? Jamur merah ya? Bisa… suda ada orange… pingirnya hijau… Barangkali ada 15. Mau turun lagi ini hari… “Bagaimana kalau jamur balon… Baru bisa, jadi malas…"

45 This was loosely interpreted as a sign of her impending good fortune; the name of the local university which she hoped to attend is “Halu Oleo,” which though named for a Southeast Sulawesi folk hero, literally means “Eight Days” in Tolaki.

46 In my naivete, I asked why nobody uses mangrove wood, since it is straight, long, and strong in the water, resisting rot. He said that is all true, but it rots easily out of the water; in the sun, it dissolves, splinters, falls apart very quickly—so no good.

47 For more on Bugis commercial culture see Acciaioli 1989, 2004. See also Ammarell 1999.

48 Despite popular stereotype, plenty of Tolaki speaking peoples have long had experience making life on the sea. Tolaki had words for most of the creatures of the sea, albeit not as many nor as finely grained as the exhaustive and precise Bajo lexicon. Indeed, many classically “Tolaki” ways of living relied on marine and coastal resources—like gathering snails and clams and nipa palms from mangrove swamps. There are well known Tolaki deities and spirits who are said to inhabit the sea, and Tarimana reports that the ancient Tolaki kingdom of Konawe had its own special marine defense forces led by a “Kapitan Laut,” or a “Sea Captain,” akin to a kind of navy or coast guard (Tarimana 1989: 186; see also Lapian 1987).

49 “Belajar berbuah”

50 Carrageenan is a seaweed based emulsifier used to thicken cosmetics and food products.

51 While in many tourist areas sea turtles have become desensitized to humans, even coming close for a look, to this day, if you come across a sea turtle in the Laonti Bay while diving, they quickly dart away.

52 Though today “financial” arbitrage is common, for example, buying stock on the New York Stock Exchange for one price and selling simultaneously on the Shanghai Stock Exchange for a slightly higher price, and pocketing the difference. Pursuit of this kind of pure-profit, risk free arbitrage is its own kind of fetish for financial traders; see Miyazaki (2013) for more.

53 Disease is a key problem for aquaculture and other marine products: seaweed, lobster, and more. I once visited a warehouse where they aggregate grouper before export, and was amazed at the piles of syringes everywhere—used to administer antibiotics to the fish so they would survive the trip to market in Hong Kong. These factors forcibly limit scale (cf. Dove 2011).

54 The lures look just like these: https://www.youtube.com/watch?v=lLqmwa4Y4dU

55 Even now, in 2022, years later and with various such corals available from cultivation, they still regularly fetch over $800—and new color variations continue to command astronomical prices.

56 For divers, you’ll recognize this as a kind of make-shift BCD system composed of lift bags.

57 Additional problems are created because this category name is sometimes abbreviated in Indonesian to “KKK,” an abbreviation which is meaningless in that language, but cannot travel into English without inviting painful associations with white supremacy and racial terror.

58 https://reefbuilders.com/2014/02/27/coral-tree-life-rewritten-lps-time/; accessed 4 November 2022.

59 See Fougeres 2008 for a similar account.

60 “Saya dibuang! Ipar saya yang buang!”

61 Moreau (2001) corroborates Imran' account and further clarifies that the same ships were previously responsible for destroying the grouper populations of Thailand and the Philippines before they moved into Indonesia.

62 Locals use the name "dianfish" "diampis" or "dianpis" for several types of small ornate wrasses. May be a kind of "flasher wrasse" or "fairy wrasse." This one had a beautiful dorsal fin like a mane, with a bright blue underside and a greenish/yellow tint around the top of the back. Perhaps genus Paracheilinus or Cirrhilabrus.

63 See also Acciaioli 1989; Wellen 2015; Ammarell 1999.

64 Number 11, must have been Daunte Culpepper?

65 This year was repeated with remarkable consistency by different people. Interestingly, this timeline corresponds directly to the period in which Treffers reports that colonial officials realized that the Laonti Bay was actually navigable; Treffers (1914) indicates that the first Dutch steamships to visit the bay did so in 1911.

66 Dampier himself describes the blessing of indigenous markings on the tops of hidden reefs, small huts or structures erected on the reefs which made them visible from a distance. It's impossible to know to who these belonged; they may have been used by local people or have been semi-permanent infrastructure set up by Sama-Bajo groups, or have been shared between the two.

67 It is possible that this slaving had been going on much longer; Tome Pires, who spent 1512-1515 in Melaka, described accounts of extensive slaving and raiding, specifically singling out people from Sulawesi as the most feared slavers and raiders.

68 Warren argues that the slave raiding was directly linked to the marine product trade—that slaves were the primary labor for procuring tripang and other marine products in Sulu. This argument is debated and not fully supported by the evidence Warren provides; given the skill necessary to gather marine products, it seems likely to me that the work of gathering these marine products was done by specialists, and that the captured slaves served other purposes. Henley (2000) likewise suggests the opposite of Warren's interpretation: that the extraordinary wealth garnered through the trade in marine products like pearls and tripang enabled the Sulu elite to fund and mount slave-raiding expeditions which served as markers of status and power in Sulu society. Sutherland (2004) also contests Warren's interpretation, noting that in Makassar—the other big center of tripang trade, slaves were not used at all; she argues that the slave trade originating in Sulu was an independent, but related phenomenon where the same elites who trafficked in sea cucumbers also fronted the capital for slaving voyages, and then enjoyed a portion of the spoils.

69 Raiding had ritual significance for many groups in island Southeast Asia; for Tolaki and Tobungku in Southeast Sulawesi, headhunting was an integral part of the grieving process by which grief was discarded.

70 Pires' 1944 English translator rendered the original "BaJuu" as "Bugis," though "Bajo" seems a much more likely candidate according to Reid 1983, Gaynor 2016, Pelras 1996, and Ammarell 1999); I concur. However, while Pelras 1996 and others have suggested that these two groups represented Bugis (the traders) and Bajo (the raiders), it also seems possible that the two groups referred to by Pires were both different Sama-Bajo speaking groups.

71 Ammarell 1999, Lineton 1975, Wellen 2015, and Reid 1983, and to some degree Pelras 1996 all agree that the Bugis became known as seafarers in large numbers only after the fall of Makassar and the mass displacements. See Wellen 2015 for a detailed study of Wajo Bugis in diaspora.

72 "Whereas Southeast Asian spices were the Asian products of greatest importance in the global long-distance trade before 1650, they were replaced by Indian cloth and indigo after 1670, and by Chinese tea, Indian opium and Arab coffee in the eighteenth century." (Reid 1997: 60)

73 For more about Arung Bakung's mysterious identity, see Gaynor 2016 and Velthoen 2002.

74 In another version of the story, Arung Bakung's son, La Sambawa, marries Maho, a Tolaki princess of Ranomeeto, also near Kendari, and their son La Mangu goes on to found a dynasty of Laiwoi which brings together Bugis, Muna, Tolaki, and possibly Bajo ethnicities into a single lineage. https://ms-my.facebook.com/groups/sejarahsulawesi/permalink/3398151303534177/?comment_id=3398260786856562

75 Staatsblad van Nederlandsch Indië over het Jaar 1911

76 Uitkomsten der in de Maand November 1920 Gehouden Volkstelling (1922)

77 Harvey (1974) pointed to the Marhaen reports; I'm grateful to the Southeast Asia library at Cornell for help accessing digitized versions during the ILL shutdown of the pandemic.

78 Gaynor's (2016) pathbreaking research on this period in Southeast Sulawesi describes the lives of Sama people as they tried to navigate life amidst the chaos, with political violence coming from all sides.

79 Pauly proposes a complex model that involves, among other elements, flows of resources and subsidies, circular systems of land use change, and patterns of gender-based divisions of labor and migration. These ideas—such as that the production of gendered divisions of labor are central in understanding migration—are important, but not generalizable to a universal model.

80 See Elmhirst (1999) for an analysis of the Suharto era transmigration program. See Lu 2019 for an examination of Malthusian thought in histories of Japanese settler colonial and imperial ambitions.

81 For more about how history is embedded in Butonese landscapes, see Rudyansjah 2017.

82 In Baubau you can still visit the cave in which Arung Palakka hid. One possibly apocryphal story depicts Arung Palakka hiding from Makassar officials in a cave deep in the earth; the Sultan of Wolio, speaking technically truthfully, tells them that the Bugis prince is "Not on our soil," and that if he is lying, may all his subjects be cursed with chapped lips.

83 "Kita tahu cerita itu tidak masuk akal, tapi betul itu"

84 For more on these stories see the powerful work of Antje Missbach (2015).

85 Gene Ammarell offers an ethnographic analysis that parallels these dynamics; the social ties between islands and between bombers and non-bombers made it difficult to deal with. The bombers were residents of the islands with just as much right to access their resources as anyone else. Appeals to the state were fraught both because state agents were implicated in the bombing, and because turning to the government signaled an unacceptable failure of local remediation efforts (cf. Tsing 1993).

86 https://www.youtube.com/watch?v=DwRF5liTGB4

87 The practice of crafting bells from bombs is common across Kendari and parts of Indonesia that were heavily shelled; it is also common across mainland Southeast Asia, the residue of half a century of bombs of empire and revolution. The practice is so common and popular that in 2018 the Cambodian government ordered its schools to stop seeking out bomb shells to use as school bells for fear of accidental detonations (see also Zani 2019; discussed more below).

88 In her collection of war stories from those lived them, Aragon (1996) also documents an important set of relations between shifting patterns of material culture and their ritual significance—especially long traditions of producing bark-cloth and its adornment with shards of mica from the same mines that villagers were forced to work for the Japanese; a bark cloth garment bejeweled with mica shards shimmers and glistens, a sign of pride and beauty for the maker and wearer.

89 "Thor" was also the code name of the United State's first cold-war tactical nuclear weapon, the MK7.

90 BulletPicker.com is a good resource for examining the diversity and details of WWII era bombs.

91 M30, M57, M43, M64, M44, and M65 general purpose heavy explosive bombs were used.

92 M81, M40, M72, and M41 fragmentation bombs were used.

93 In addition to 500lb and 1000lb auxiliary napalm tanks, M6 and M7 (both containing clusters of M50 bombs), M12, M17, M78, MK1Vs, M47A2 incendiary bombs were used.

94 There are no words to adequately describe the darkness and horrific historical fallout of Haber's research. After the rise of Nazism, Haber was barred from his own lab, and would flee Germany in 1930; Haber's own research into synthetic pesticides would be weaponized by the Nazis in the form of Zyklon B, used as the primary chemical agent of Holocaust gas chambers.

95 In his essay "The Oil We Eat" Richard Manning makes the case for viewing industrial agriculture as violence; a violence whose manifestations are multiple: the eradication of natural habitat for expanding monoculture; the unequal access to healthy food that fuels health disparities and famine; the violences of nitrogen; and the oil wars to secure the fossil fuels to continue a carbon intensive system that consumes more energy than it produces.

96 The work of Fox et al. (2003; 2005) explores exactly these scenarios and informs my writing here.

97 Pasal 85, Undang-undang (UU) No. 45 Tahun 2009

98 Pasal 1 Ayat 1 Undang-undang Darurat Nomor 12 Tahun 1951

99 https://www.republika.co.id/berita/r16fe3456/nelayan-gunakan-bahan-peledak-untuk-ambil-ikan-ditangkap

100 Perhaps the first high-profile case came in 2000, with the Rizal Day bombs that killed 22 people across Metro Manilla, carried out by Philippine and Indonesian terrorists using fertilizer bombs and blasting caps acquired from fish bombers in Cebu.

101 https://jakartaglobe.id/context/detained-ipb-lecturer-made-real-bombs-not-molotov-cocktails-police-say

102 John Bowen (1986) has a fascinating essay on the nationalist origins of ideas of gotong royong and kerja bakti. Nancy Peluso (1992) comments on its origins in colonial and feudal Java.

103 The stated aims of GEMASATUKATA were: "This activity is a learning event intended to raise common awareness of the importance of the duties and functions of quarantine, as well as fish biological safety, quality, and safety of fishery products, and to realize an independent, advanced, strong, and national interest-based Indonesian marine and fishery sector with a focus on achieving the missions of Sovereignty, Sustainability and Prosperity." In other words, spectacle. "Kegiatan ini merupakan ajang pembelajaran dengan upaya untuk membangkitkan kesadaran bersama akan pentingya tugas dan fungsi karantina dan keamanan hayati ikan, mutu dan keamanan hasil perikanan serta mewudjudkan sektor kelautan dan perikanan Indonesia yang mandiri, maju, kuat, dan berbasis kepentingan

nasional dengan fokus melaksanakan misi pada Kedaulatan, Keberlanjutan, dan Kesejahteraan."

104 "Kita wujudkan / penyediaan pangan sehat / untuk peningkatan gizi masyarakat." (Note: this hearkens back to the nutritional components of state modernity in government headhunters)

105 Aquaculture refers to the controlled production of aquatic organisms in any environment; mariculture is a subset of aquaculture that involves growing marine organisms directly in the ocean.

106 Herbivore loss happens all kinds of ways. Habitat loss is key. But even over-fishing of predatory fish like grouper can have cascading effects—for instance leading to the growth in populations of algal "farming" Damselfish who defend and care for plots of macro algae on coral reefs, cultivating them as a food source.

107 Frias-Torres and Geer (2015) found that by siting their restoration project next to a healthy coral reef they reduced the labor requirements for restoration by 60%—because the herbivores did most of the work for them. However, the sites directly adjacent to a healthy reef are possibly the sites least in need of human led restoration; it is debatable if this is the best use of restoration resources, since healthy reefs may well be able to successfully expand on their own—the question of necessity or efficacy of this kind of "assisted expansion" is up for debate.

108 Boström-Einarsson et al. 2020 report that the mean size of a restoration plot was roughly 100m2.

109 "Saya bilang, begini bapak, ilmunya yang mahal, bukan uangnya, tapi ilmu yang mahal."

110 https://wajahsultra.com/tim-saber-pungli-dimintatuntaskan-dugaan-ilegal-mining-tiga-tambang-emas-di-bombana/

111 Beavis and McWilliams 2018 found elevated levels of mercury in Bombana's rivers, and note that these levels—which exceed recommended levels safe for human consumption—were likely low due to the timing of sampling, making the elevated mercury levels "a best case scenario."

112 Southeast Sulawesi media outlet archives index some of the serious number of accidents and deaths in which the trucks are implicated: 1) https://zonasultra.com/suaminya-tewas-ditabrak-truk-pt-cam-nasib-irt-asal-konsel-ini-memburuk.html, 2) https://zonasultra.com/tertabrak-truk-boks-pelajar-sma-di-konut-tewas-di-tempat.html, 3)https://zonasultra.com/wanita-asal-konut-tewas-tertabrak-truk-bermuatan-material.html

113 In 2017 roughly 97% of Indonesian nickel exports went to China according to the OEC.

114 IUP – Izin Usaha Pertambangan or Commercial Mining Permit

115 Sertipikat Hak Milik

116 There are many slightly different versions of the story of Wa Kaka; my account here draws on the work of Butonese scholar and choreographer Wa Ode Eva Ochtaviani M (2017), but see also Maula et al. 2011 for a rich account of Butonese history including the historiographic question of Wa Kaka

117 "Wa" is the Butonese feminine honorific, and Kaka is a version of "kakak" or older sibling.

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