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‘Abounds with fine oysters’:
The (post)colonial political ecology of an estuary in southwestern India

By

Adam Franklin Jadhav

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

Geography

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Michael Watts, Chair
Associate Professor Garrett Graddy-Lovelace
Professor Nancy Peluso
Professor Nathan Sayre

Summer 2024

Abstract

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The persistence of fishing, farming and forestry by peasant households still provokes “agrarian questions” today, especially in the colonial and postcolonial Global South. What is to become of such small rural producers? How are they reorganized, subjugated or remade? What is their role in the development of industry and non-agrarian economies? Can an agrarian surplus — all the produce of peasant households, only some of which ever enters markets — become the basis for broad development of capitalism? In India, these questions were asked repeatedly by European colonial administrators invested in the project of “improvement” of the rural world for the extraction of profits. In postcolonial India, they have remained trenchant concerns for the environment-making, biopolitical state interested in governing and potentially transforming agriculture for national development and the accumulation of capital. Asking after the fate of India’s peasantry — at a time of widespread agrarian crisis and increasing climate change — remains both analytically and politically fruitful.

This doctoral dissertation explores these topics of agrarian development and transformation along the coast of southwestern India. After an introduction, Chapter 2 introduces and historicizes the Aghanashini River estuary (and its dynamic and robust peasant ecology and economy) and discusses the intellectual, political, ethical and methodological concerns of this research. Chapter 3 starts by examining contemporary discursive imaginaries of the estuary, including dominant elite conceptions of the backwardness of rural coastal places, before turning to results of nearly 20 months of field research, highlighting robust, more-than-market production of agrarian abundance that supports a form of defensive politics. Chapter 4 reviews discourse and practice of India’s engagement with the U.N.-sponsored Sustainable Development Goals (SDGs) and specifically the oceanic Goal 14: Life Below Water. This analysis finds India’s “performance” of sustainable development assessment at once reifies the development industry’s fetish of quantification while also creating a mutable, ambiguous “standard” of sustainability that occludes actually existing unsustainabilities. Chapter 5 presents a collaboration with remote sensing scholars that performs an “ecosystem service valuation” of the Aghanashini estuary, estimating a dollar worth far above regional GDP, before considering critically the

usefulness and “value” of such valuations, particularly for environmental politics. A final chapter-length coda and conclusion considers the near-term future of the peasantry confronting waves of coastal capitalism.

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For Ishani,

who won't let me accept our world as it is,

because another world is possible.

कुछ भी हो सकता है

इंक़िलाब ज़िंदाबाद

Preface

This dissertation and my doctoral study have been interrupted on multiple occasions by a series of personal, mental and physical traumas: the death of a close uncle in India in 2017; a complex cycling injury in 2018 (which would require surgery more than a year later); the sudden deaths of a field research comrade and my own sister in 2019; and the global pandemic from 2020. In short, nothing has gone according to plan. My health difficulties continued until the moment of filing, and I very much needed the help of my entire team to finish. This is some cause for shame, and I owe that much more to everyone who has carried me along. I will take very small consolation knowing a dissertation does not live under the hegemony of Reviewer 2 in the same way as other scholarly writing,[1] and I was never going to write a traditional manuscript anyway. I note these struggles with zero desire for pity, but rather an interest in being transparent about the full price of doctoral study.

[1] https://www.facebook.com/groups/reviewer2/

Acknowledgements
I will start by noting some problematic conditions of possibility for my doctoral study. The University of California at Berkeley sits on the territory of xučyun (Huichin), the ancestral and unceded land of the Chochenyo-peaking Ohlone people. Today's neoliberal university continues to participate in settler colonialism and often, on balance, supports racial capitalism and American empire as much as it disrupts or challenges their hegemony. In this way, my research into colonial and postcolonial geography has relied upon institutions and legacies of the empire that I critique. What I have learned during my doctoral study inspires these political acknowledgements.

Whatever neoliberal origin story we might be told about the specialness and uniqueness of our abilities, in my experience, earning a doctorate takes a village, and even then it can be an uphill battle. During the past eight years, I have accrued many debts along with some shame at being unable to repay them.

I cannot fully express my gratitude to my dissertation committee — Michael Watts (chair), Garrett Graddy-Lovelace, Nancy Peluso and Nathan Sayre — for guidance and assistance when I needed it most; I have not washed out of doctoral study because of their backing. I also sincerely appreciate the service of past committee members Janaki Bakhle and Sharad Chari. An additional shadow committee of advisors and boosters — Ramchandra Bhatta, Aarthi Sridhar, Gill Hart, Jeff Chambers, Jovan Lewis among others — have also given generously without any obligation.

My doctoral study would have been equally impossible without student comrades, including Rosanna Carver, Jeff Martin, Jesse Rodenbiker, Eve McGlynn, Jane Henderson, Xander Lenc, Alexander Arroyo, Leonora Zoninsein and Ailén Vega and many others. I also had crucial help and friendship from Berkeley staff, including Dan Plumlee, Josh Mandel, Sarah Varner, Alicia Cowart and Susan Powell, as well as folks at the Tang Center who pieced me back together more than once.

My research has developed in me a deep appreciation for library, archival and other collection/curation staff (i.e. laborer-thinkers) at numerous institutions, including my PhD home. Simply put, librarians make my world go 'round, and universities need to value them far more than chancellors, presidents and the like.

Mangal Shetty, Panchabhuta Conservation Foundation, and WWF-India provided institutional and financial support for field research, which only happened because of the team efforts of Shahista Banu, Adarsh Bhat, Govind Birkodi, Praveen Haller, Shilpa Haller, Shridhar Hegde, Abhishek Hinakar, Akanksha Kohli, Bharath Kumar, Depeesh Naik, Dennis C.J., Mythreyi Kumaraswamy, Akhila Machaiah, Manaswi Raghurama, Madhu Srinivasan and Shivaprakash Yaragal. PCF Field Station Manager V. Rajalingam, who died in 2019,

deserves special mention for his unceasing, behind-the-scenes support of this research and genuine concern for my well-being. I am selfishly sad to have lost a friend (and *imli* dealer); far worse, conservation and sustainable development efforts around the estuary suffer from his absence. Other Aghanashini long-time hands including Prakash Mesta, Balu Hegde, Mahabaleshwar Hegde and M.D. Subash Chandran also gave help at important moments.

I of course simply can never compensate Aghanashini Estuary residents themselves, who patiently put up with me and my team for *hundreds* of hours of interviews and surveys, trusting us with their ideas, fears, ambitions and knowledge.[2] And that's to say nothing of all the readily shared *chai*, *kaju*, *imli* and *paan*.

Finally, I thank all my kin, including those who have gone before, for enabling me to tread my path and for giving *everything*. My little birdy buddy also deserves special mention as a source of constant affection and potent treatment for depression and anxiety. Above all, I owe Ishani, the love of my life, for holding my hand at every step.

[2] I cannot escape the extractive, colonial character of such research, however critical or radical my analysis or intent might be. See **Chapter 2** for additional reflection on research methods, politics and ethics.

Chapter 1 | 'Abounds with fine oysters': Encountering the Aghanashini River estuary

> I went a long journey, called four cosses, and encamped on the south side of a river opposite to *Mirzee* (Mirjan). About two cosses from *Hulledy-pura* (Haldipur), I came to a town named *Cumty* (Kumta). It seems to have been formerly a place of some note. Its lanes are straight, and fenced with stone walls, and it has many coco-nut gardens. Twice it had the misfortune of having *Tippoo's* (Mysorean ruler Tipu Sultan) army encamped in its vicinity; and on both occasions it was burned down by some of the irregulars. On its south side is a plain, intersected by a salt-water creek, which allows much salt to be made. The soil of the plain, which extends all the way from *Hulledy-pura*, is very sandy. For a coss north from *Cumty*, the ground is high, with very little cultivation ; but a great part of it seems to be fit for being formed into *Mackey*, or at least into *Betta* land. Between this and the river is a very fine plain, called *Hegada* (Hegde), from a small town near which I encamped. The low lands here are subject to being inundated by the swelling of the river, which frequently spoils the *Catica* crop of rice when the farmers attempt to cultivate it. **The appearance of the farm-houses at *Hegada* denotes that the inhabitants are in a much more comfortable situation than is usual in India. The river is called *Tari-holay* (Tadri, the contemporary Aghanashini River), and abounds with fine oysters.**
>
> — Francis Buchanan, travelogue "entry" for 24 February 1801[1]

Introduction

In winter 1801, colonial surgeon, naturalist and surveyor Francis Buchanan had already spent months traversing the new territories gained through the metamorphosis of the British East India Company (EIC) in the late 18th century from armed, interloping mercantilists into tax farming, bureaucratic overlords. His voluminous relatively chronological diary would eventually be edited and published in three volumes (1807), full of colonial observations on ecology, economy and even politics across the newly expanded Madras Presidency. Traveling cross country on palanquin, Buchanan had sponsorship from none other than EIC Governor-General Richard Wellesley, who had personally overseen the war that deposed Tipu Sultan and claimed a vast swath of South India. Buchanan's assignment was a rapid assessment that Wellesley could use with his directors to "confirm the economic benefits to the Company of his controversial war with Tipu and justify the conquest of the region" (Watson and Noltie 2016).

This work brought him, on 23 February, to a region he would call *Haiga*, after the dominant brahman community of agriculturalists who were "cunning as foxes, and much alarmed concerning my intentions in questioning them on such subjects" (1807, Vol. 3: 139). In this region — the contemporary (mostly) coastal tract of Karnataka's Uttara Kannada District

[1] Emphasis added, Buchanan 1807,152. I have chosen to reproduce Buchanan's spellings as they appear in the original work, rather than attempting any still imperfect transliterations of my own.

on the southwestern coast of India — Buchanan noted multiple local land uses such as *betta* (terraced)*, cumri* (shifting cultivation)*, gujiny* (flooded, brackish) *and mackey* (rainfed, non-terraced)*,* and recorded nearly a dozen currencies in local circulation, some ancient, some of European invention. He also found that most cultivated lands were something akin to a British idea of private property, a supposed "discovery" also made by a young Thomas Munro, then the district collector in the region, years before he would become governor of Madras and a key architect of the British colonial state in India.[2] This finding was both relevant to broader debates about land taxation in British India and central to the task assigned by Wellesley a year earlier: "The first great and essential object of your attention should be the Agriculture of the Country," reads the letter from Fort William in Calcutta to Buchanan (1807, Vol. 1: v-x), before detailing specific requests under headings for:

- esculent vegetables
- cattle
- farms
- cotton, pepper, sandalwood and cardamom
- mines, quarries, minerals and mineral springs
- manufactures and manufacturers
- climate and seasons of Mysore

Wellesley instructed the expedition to also collect specimens of "whatever useful, or rare, and curious" plants, seeds, arts, crafts, minerals and manufactured goods Buchanan might encounter. Given the company's crown monopoly on British trade in and out of India, Wellesley's interest in commodities, industries and land uses is unsurprising, but he also sought *anthropological* and *sociological* reconnaissance of the company's new subjects. An additional request makes apparent the newer, less-mercantile gaze of the EIC, as a proto-nature-improving, environment-making, population-organizing state (cf. Drayton 2000; Parenti 2015; Scott 1998). In short, Wellesley wanted much of the knowledge necessary for modern state rule and biopolitics (Foucault 1991): demographics, public-private relations, social hierarchies/inequalities, institutions, economics, health, wellbeing, etc.[3]

> "The condition of the inhabitants in general, in regard to their food, clothing, and habitations, will engage your particular attention; you will also enquire how far their situation, in these respects, may have been affected by the different changes in the government. The different sects and tribes, of which the body of the people is composed, will merit your observance; you will likewise note whatever may appear to you worthy of remark in their laws, customs, &c.; and state, with as much accuracy as may be in your power, the nature of their common usages in matters of personal traffic at their markets, their weights and measures, the of money, and the currency among the lower

[2] The details and significance of which are recounted more in **Chapter 2**'s historicizing of the Aghanashini. See also Stein (1989).

[3] Such population accounting was advocated even by Malthus (1798), as a way to manage the poor of England who constituted a de facto threat to class power.

> orders of people : and such matters in respect to their police, as may seem to you to have an immediate or particular tendency towards the protection, security, and comfort of the lower orders of the people" (Buchanan: 1807:viii-ix).

On 24 February, 1801, a day after his meeting of the "cunning foxes" of the Haiga agrarian elite, Buchanan arrived on the shores of a river he named "*tari-holay,*" today's Aghanashini River in Uttara Kannada District. His government entourage and livery established camp opposite the imposing stone fort of Mirjan, which still stands today. He was impressed by homestead gardens and recorded details of *betel-nut* (areca) coconut care and harvesting, noting differences between rich and poor households. Overall, he was surprised to find a peasantry already (re)producing its ecology and economy in "a much more comfortable situation than is usual in India" (1807, Vol. 3: 152). In the only refence to any Indian bivalve fishery in almost 1,800 pages of travelogue, he also commented explicitly on the abundance of the estuary — "abounds with fine oysters."

Buchanan's single-night stopover is one of the estuary's earliest brushes with the British colonial state and the on-ground operations of the "colonizer's model of the world" (Blaut 1993). Buchanan also inadvertently records perhaps the first — though not the last — occasion when the peasants of the Aghanashini would contradict external imaginaries about "development" or otherwise surprise officials, elites and other agents of prospecting, surveilling (post)colonial racial capitalism (Gilmore 2002; Koshy, Cacho, Byrd, Jefferson 2022; N.B: Robinson 1983). These peasant fishers, farmers and foresters of the Aghanashini River estuary — and their abundant coastal political ecology and economy past, present and future — are the focus of my doctoral dissertation.

Overview and arguments

This dissertation proceeds through four "chapters." The first two form an extended presentation of coastal development history, politics, imaginaries, ambitions and politics at the scale of an estuary along India's southwestern coast. **Chapter 2** introduces and historicizes the Aghanashini River estuary's dynamic and robust *peasant* ecology and economy, before turning to a discussion of intellectual, political, ethical and methodological concerns of my research. **Chapter 3** starts by examining contemporary discursive imaginaries of the estuary, including dominant elite conceptions of the backwardness of such rural, coastal places. I then explore at length the results of 20 months of research, highlighting robust, more-the-market production of agrarian *abundance* that supports a form of defensive politics. I conclude by discussing the political and analytical stakes of identifying peasant abundance as a category, especially in light of widespread agrarian crisis, climate change and the advance of extractive market forces and interests into India's rural coast. **Chapter 4** offers a discourse and policy analysis of India's engagement with the U.N.-sponsored Sustainable Development Goals (SDGs) and specifically the oceanic Goal 14: Life Below Water, already published (Jadhav 2024) in a Springer edited volume on the SDGs in India. This analysis finds India's "performance" of sustainable development assessment at once reifies the development industry's fetish of quantification while also creating a mutable, ambiguous "standard" of sustainability. Using the case of the Aghanashini, I then explore how contemporary coastal and oceanic development in India

creates actually existing unsustainabilities, which reflect all manner of neoimperial dreaming and scheming. **Chapter 5** presents a collaboration with remote sensing scholars (Jadhav 2017) that performs an "ecosystem service valuation" on the Aghanshini estuary, estimating a dollar worth far above regional GDP, before considering critically the usefulness and "value" of such valuations particular for environmental politics; our goal was to interrogate and problematize — but not outright dismiss — the epistemic paradigm of ecosystem goods and services, which is legible and amenable to both policymakers as well as capital. Ultimately, this open-access publication in *Sustainability* became a small environmental political object in its own right, wielded as evidence by environmental activists in India.

Chapters 2 and **3** adopt a reflexive, personal language and perspective insistently, in line with calls in critical scholarly and practical fields — including political ecology — for such attempts at transparency (see Liboiron 2021; Loftus 2015; Sundberg 2017). I am also intentionally choosing to write similarly to how I speak, for both personal and political reasons, as well as writing directly to a dissertation audience first and foremost of advisors, colleagues and other friendly scholars and activists — especially in India. These chapters also notably spring intellectually from critical agrarian and development studies traditions that have often promoted scholar-advocacy,[4] and so the writing consciously leans political and rhetorical at times. **Chapter 4** largely follows a similar political economic analysis, but trains its sights on the commanding heights of national and international sustainable development policy and discourse (while still keeping a weather eye on the estuary). **Chapter 5** was written most with its audience of Indian policy makers and advocates in mind and in a language broad accessible to multiple political and ideological view points (for example, using the word "capitalist" just once).

The assembled chapters here are not intended to form one linear narrative nor do they aim to be a traditional doctoral dissertation. Though **Chapters 2** and **3** are sequential, they do not need to be read before the others. Each chapter does inform the others in some fashion, even if **Chapter 5** served as a collaborative analytical salvo early in doctoral study. Chapter formats also diverge some from very traditional academic writing, and I have perhaps taken liberties in voice and style that at times might seem windy and pretentious. This of course isn't particularly novel as my home field of critical human geography tends toward accepting and embracing more eclectic or experimental writing, not all of which "works."

Though they can be read separately, when taken together, the chapters of this dissertation support to three interlocking claims concerning the fates of *peasant* life and livelihoods:

- *Argument 1*: The **devaluation of rural, coastal landscapes** — including dynamic, contemporary, ecologies and economies not fully subsumed under market forces

[4] Throughout parts of doctoral study I have maintained nominal membership in the Agroecology Research Action Collective, the Emancipatory Rural Politics Initiative and the Too Big To Ignore small-scale fisheries collective; each offers a home for collaborative and even transdisciplinary scholars whose work embraces the task of political and normative critique and action. Each has provided me a *much needed* space at different times for reinvigorating and reaffirming commitments to politics-forward scholarship.

and commodity logics — **can be as discursive as it is material**. Pollution, degradation and despoliation of marine and estuarine geographies are frequent concrete outcomes of creeping of capitalism or the "agrarian transition," but elite imaginaries, storytelling and even official declarations (e.g. in a dubious environmental impact assessment) also work to ignore, downplay, dismiss, occlude, erase or **reframe peasant production as dwindling, vestigial**, backwards and available for/in need of transformation.

- *Argument 2*: "**Development" and "improvement"** and similar concepts and interventionist practices **remain as crucial to (neo)imperial dreaming and (neo)liberal politics/policies** as they were to European colonial projects. Activities under these rubrics often survived independence movements, often via bourgeois and passive revolutions,[5] and continue **to convert the supposedly postcolonial rural world into sacrifice zones and internal colonies** for accumulation.
- *Argument 3*: As much as development ideas and doctrines — and indeed the logics and motivations of capitalism's march — constitute **lasting forms of imperial duress, they are not hegemonic always** and everywhere across agrarian geographies. Indeed, **Peasant abundance — broadly understood — can and does serve as a basis for its own defense**, and examples abound (not unlike oysters) of marginalized and dispossessed people and communities organizing their own (re)production through more than market means while fighting political struggles at various scales against (neo)colonialism and neoliberal extraction. This will be continually more true as climate change stresses and transforms ecologies and economies.

These admittedly are grand broad arguments, and I suggest that each of my dissertation chapters provides perhaps "small-cut" empirics and analysis that lend support to each of these claims. For example, all four chapters support *Argument 1* by highlighting the discursive production and reframing of the Aghanashini's peasant ecology and economy as vestigial or marginal as well as a sign of poverty, rather than a bulwark against it. **Chapters 2** and **3**, in particular, work against this discursive negation through an analysis that insistently holds open the category of the peasant against narratives of agrarian transition that cast peasants only as struggling commodity farmers who are not efficient enough to stay afloat. **Chapters 2** and **3** also most clearly address *Argument 2* through historicization of the estuary and its relation to broader colonial and postcolonial development projects. **Chapter 4** in a sense combines *Arguments 1* and *2* to show how the discursive flexibility found in India's performance of the SDGs serves neoimperial development ends. **Chapter 5** provides something of a heterodox accounting of the estuary's high "value in support of *Argument 3* and in the policymaker's language and tools of "ecosystem goods and services." The monetary estimate reported also serves both as an object for critiquing (neo)liberal approaches to valuing nature and points to the potential for politics around important ecological abundance not captured by market pricing. **Chapter 2**, meanwhile, recounts the estuary's history of resistance to state or capitalist appropriation, and **Chapter 3** provides

[5] And specifically in India, the blocked dialectic between nationalism and colonialism that would never challenge the historical association between reason and capital (N.B. Chatterjee 1986).

an empirical portrait of this more-than-market ecology and economy as the basis for peasant (re)production as suggested by *Argument 3*.

Broadly, my research is in conversation with often-Marxist scholarship on peasants and capitalist development in the countryside (Kautsky 1988; Lenin 1956; Cooper 1993; 1996; Byres 1996; Gupta 1998), as well as now classic research in political ecology on the historical, social and political economic configurations of power and struggle attendant in the production, development, use and abuse of "nature" (e.g. Watts 1983; Peluso 1992; Peet and Watts 1996). Commodity (and commodity chain) studies have repeatedly shown how "nature" is produced through historical processes that persist in markets and industry (Cronon 1991; Prudham 2005; Beckert 2014). My research also builds upon lesser-known, recent political ecology and economy of oceanic resources that highlight processes of commodification of not only fish but also access, rights and space (Bresnihan 2016; Carothers 2010; Longo, Clausen and Clark 2015; Mansfield 2004, Subramanian 2009). In taking these questions of development and capitalist transformation to India's coastline, I also engage social science in India often concerned with the fate of small-scale or subsistence fishers past and present (cf. Bavinck 2014; Johnson 2002; Hoeppe 2002; Subramanian 2009).

Research overview

This dissertation grows out of more than a decade of engagement — through advocacy, research, even journalism — with multiple coastal spaces and places along India's coastline, and in particular rural, "traditional" fishing communities. As such, some of the data, observations and experiences presented here predate my doctoral study or draw on other peer-reviewed and policy publications on related topics of Indian coastal development, conservation and politics. In 2012, as a "consultant" researcher for Greenpeace India,[6] I produced an atlas of marine conservation data along with an accompanying analytical essay identifying multiple oceanic "spaces" with ecological, economic *and* social value. For a small marine conservation NGO in 2015, I wrote an extended analysis of India's political economic ambitions and regulatory state of play for upcoming seabed mineral extractions projects as well as established marine oil and gas drilling. During doctoral study, I collaborated with Indian colleagues to write a chapter for a book global implementation of FAO fisheries guidelines. Our analysis (Gunakar, Jadhav, Bhatta 2017) traced the history of India's flagship fisheries regulation — coast-wide bans on fishing during rough monsoon seas — and argued that broad consensus politics negotiated between fishing communities have contributed as much to its "success" as either ecological or economic justifications. A year later, I published a chapter of critical quantitative analysis of poverty in Indian fishing villages (Jadhav 2018) in an edited volume focused on social wellbeing in small-scale fisheries globally.

Since 2014, the geographic focus of my research and advocacy has been the Aghanashini river estuary — the same estuary that Buchanan noted "abounds with fine oysters" (1807: 152) — and its surrounding agrarian communities on the southwestern coast of India (in

[6] https://www.greenpeace.org/static/planet4-india-stateless/2018/06/Identifying-Conservation-Needs-in-Indias-Offshore-Waters.pdf

the northern coastal district of Karnataka state). I first encountered the estuary in 2014 when I was assigned to the Indian central government's National Centre for Sustainable Coastal Management (NCSCM) as a Nehru-Fulbright fellow, assisting a household survey project intended to inform coastal zone management.[7] The Aghanashini estuary appears in Indian conservation literature as a "lightly touched" biodiverse (wet)landscape, one that was routinely in the cross hairs of industrial development; as such, it offers a fruitful early pilot location for NCSCM's survey. In early 2015, I would return to design and manage research and programming for a fledgling NGO, the Panchabhuta Conservation Foundation (PCF), based near the estuary. Over nearly 20 months, I led a team of assistants fluent in local languages; collectively we ran two large-n household surveys, conducted hundreds of interviews and took thousands of photographs. We intended to document the agrarian ecology and economy of the estuary; investigate local aspirations and fears for "development," "conservation" or other; and experiment with conservation education and sustainable agriculture demonstration, based upon our research.

PCF's most intensive survey research asked questions about natural resource dependence, development and conservation at the scale of the estuary, against the backdrop of a political-economic contest over a state-led proposal to situate an industrial shipping port within the estuary. Our advocacy-oriented study — with partial funding from WWF-India's Small Grants / Conservation Catalyst Programme — included dozens of questions, scales and even a quasi-contingent valuation of the proposed shipping port. After six months of scoping interviews, meetings, design, translation, external reviews, piloting and revision of our questionnaire, we carried out the survey from May to August 2016. Running OpenDataKit on Android smartphones, we collected a spatially referenced sample of households (grand n=1,003) from villages adjacent to or within the estuary, increasing our confidence in the social and geographic representation of the findings.[8]

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[7] https://ncscm.res.in/esa-cvca/

[8] Without population rosters for sampling, we relied on a field method guided by Census of India data (2011) and state government coastal zone data and maps. Survey teams walked transects along public roads and foot paths throughout the villages bordering the estuary, attempting surveys at every fourth house (continuing if unsuccessful to adjacent homes until completing a survey before restarting the sampling interval). Using smartphones and Open Data Kit apps to deliver surveys, in Kannada, Hindi/Urdu and English, also enabled us to spatially reference respondent households and track/adjust survey effort on the fly and perform spatial analysis in the future. I designed the survey questions, scales, response options and prompts based on literature, more than 100 semi-structured interviews, informal focus groups and a half-day "community meeting" that drew more than 50 participants from around the estuary. This helped me employ categories, names and response options that were suggested by estuary residents themselves. The entire research team also provided input before and after a pilot run. Surveys opened with an informational disclosure and required verbal consent; any knowledgeable adult in the household could participate Interviews were conducted in public view or in private according to the respondents' choice, and respondents could withdraw at any time. Privacy safeguards included logging GPS points of households with reduced precision (striving for a minimum +/- 30 meters) and never recording respondent names. At the survey's end, respondents could opt-in to receiving updates and follow-up regarding the research and PCF's work, by providing a cell phone number that was delinked from survey answers. As an aside, I hate the clinical character of the word "respondent," which betrays a fundamental limitation of survey research. However, words that might imply more dialogic (or even dialectic) exchange, collaboration or partnership would disingenuously describe a traditional survey interaction. I do regularly employ "interlocutor" to refer to people with whom I (and PCF staff) worked and talked regularly. But delivery of a structured survey questionnaire is *not* a conversation —

In addition, PCF created an agroecological catalogue and calendar to a systematic-if-broad scoping of the local peasant ecology and economy. Carried out from September through December 2015, this work relied heavily on key informants, community elders and locally identified agroecological "experts." Using a semi-structured questionnaire, we asked producers, cultivators and harvesters about dozens of individual fruits, vegetables, and other produce regularly cultivated in fields and home gardens, in addition to dozens more fishery and non-timber forest products harvested from forest, grassland and wetland commons. PCF's repository of this data — aggregated interview notes, photographs, survey returns, policy analysis and other data concerning the Aghanshini estuary — provides a substantial "secondary" dataset for this doctoral dissertation. My analysis of these particular "datasets" is, of course, supplemented by other experiences and observations[9] gained from managing PCF, and my claims are further refracted through subsequent years of doctoral study on marine and coastal development, politics and science in colonial and postcolonial India.

The global coronavirus pandemic ultimately pre-empted further fieldwork in India and forced drastic shifts in my research plan, sites and methods. I spent more than year conducting archival research primarily around institutions in the United Kingdom. This included nearly six months working through the private papers of a colonial fisheries administrator held in the University of Cambridge Library, and nearly as much time digging through the India Office Records and other colonial materials pertaining to fisheries, coastal development and the Aghanashini River estuary held in the stacks of the British Library. I also made shorter visits to the British Natural History Museum, the British National Archives, the Victoria and Albert Museum, the Museum of the Docklands, the Port Authority of London archives, the library of the Zoological Society of London and the Viktor Wynd Museum of Curiosities, Fine Art & Natural History. Additionally, I spent three weeks "in-residence" at the library of the United Nations Food and Agriculture Association. During these visits, I digitized nearly 100,000 individual pages of material pertaining to colonial and postcolonial fisheries development and science in India. I have only scratched the surface of these materials for this dissertation, but apart from specific citations and historical details, my archival research records and experience critically inform my arguments about the imperial project past and present. This materials also will provide prime research fodder when I begin an environmental history and conservation postdoctoral fellowship at the American Museum of Natural History in New York in September 2024.

My doctoral study and research have been funded through a Fulbright-Hays Doctoral Dissertation Research Abroad, a Social Science Research Council International Dissertation Research Fellowship and a Simpson Fellowship from the Institute of International Studies, in addition to departmental and university stipends, tuition and paid labor. PCF research

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no matter how inclusive we might strive to make its design — so I accede to convention and use a word I detest.

[9] To be clear, while I might investigate my (and my team's) various observations of life and livelihood around the estuary through further interviews, PCF intentionally did not conduct ethnographic research.

(including as my salary) was funded by the organization itself with additional material support from WWF-India and an in-kind grant of satellite imagery from the Digital Globe Foundation (now subsumed within Maxar Technologies).

Chapter 2 | The Aghanashini River estuary: History, geography and research design

> "The small-holding peasants form an enormous mass whose members live in similar conditions but without entering into manifold relations with each other. Their mode of production isolates them from one another instead of bringing them into mutual intercourse. The isolation is furthered by [the country]'s poor means of communication and the poverty of the peasants. Their field of production, the small holding, permits no division of labor in its cultivation, no application of science, and therefore no multifariousness of development, no diversity of talent, no wealth of social relationships. Each individual peasant family is almost self-sufficient, directly produces most of its consumer needs, and thus acquires its means of life more through an exchange with nature than in intercourse with society. A small holding, the peasant and his family; beside it another small holding, another peasant and another family. A few score of these constitute a village, and a few score villages constitute a department. Thus the great mass of the … nation is formed by the simple addition of homologous magnitudes, much as potatoes in a sack form a sack of potatoes."
>
> — Karl Marx, *The Eighteenth Brumaire of Louis Bonaparte*, 1926 [1852]

Setting the scene

It's early March and the mid-afternoon sun blazes high above the calm expanse of the Aghanashini River estuary on the southwestern coast of India. The advancing dry season has already baked the narrow coastal flatlands and backwaters of northern Karnataka that sit between the sea and India's Western Ghats mountains. Croplands, gardens, meadows and even the forests have begun to wither and brown. The river's flow falls conspicuously as creeks, rivulets and other small tributaries throughout the watershed dwindle to a trickle. Though wisps of clouds or haze rolling off the ocean will sometimes dull the sun and provide temporary shade, the steaming landscape will see little if any rain until late May or early June when patchy showers herald the much-awaited South Asian monsoon.

This regional desiccation sets the stage for a spectacular hydraulic transformation of the wide, shallow estuary. When the tide pulls out, the already diminished river retreats to its main channel — as if someone unplugged a great drain in this bathtub-calm expanse — exposing shallow sand bars and mudbanks to the oppressive sun; the humidity is palpable. Regiments of terns and kites and occasionally even a grand white-bellied sea eagle soar overhead or jockey for a perch near the estuary's edge. As the riverbed dries and cracks, crabs, snakes, fish and other estuarine creatures scatter for the safety of deeper pools or the shade of mangrove roots. If solunar and climatological forces are strong enough — the days around a full or new moon or when the strongest winds blow out to sea — you can practically ford the estuary on foot.

With the riverbed revealed, phalanxes of sari-clad fishers fan out with knife and jug in

hand, to hunt for the oysters and clams that contribute to a historical tradition of bivalve harvesting (see **Figure 2.1**) in many estuaries and backwaters along India's southwestern coast. Fishing canoes made of stitched, oiled wood panels meanwhile sit aground, and fishers check on their bag nets fixed to the now-visible river bottom. Larger trawlers and purse seine boats stand idle in the deepest sections of the estuary or lie stranded in the shallows, waiting for the tide push back in. The halt in fishing effort also offers the chance to prepare for future trips; hulls can be sealed, barnacles scraped off, nets mended and supplies restocked. The salt panners close their sluice gates to hold the levels of their reservoir and salterns, while fish ranchers open theirs to drain their submerged fields, netting all manner of fish and crustaceans in the process. Small-scale fishers do likewise as traditional *gajni* floodlands, ponds and swamp commons dry out.



Figure 2.1 *— Upper left and right: Two women return from mudflats exposed at low tide with a headload of oysters. Lower: Bivalve collectors bury surplus harvest for in situ "storage" in mudflats near their homes before the return of the tide.*

The low water also affords the opportunity for mangrove planting by farmers who use the trees to shore up dikes and conservationists vested in afforestation projects. If allowed (or when authorities aren't looking), a shadowy dredging industry also sometimes descends on the shallows to dig up dead oyster shells or river sand for lime and concrete production. A few households might trudge out to dig up some of the black "soil" that accumulates in corners of the estuary where river currents tend to deposit the degraded leaf litter and tannin-rich detritus of the watershed. Meanwhile, the peanut harvest is coming in and the meadow grasses in a nearby abandoned hill fort are ripe for cutting. Overdue seasonal

chores await some family members while others may labor in the fields for their neighbors or large landholders locally. Still others may take work farther away in petty factories processing coconut, cashew or areca, or in Karnataka's coastal cities (sometimes in the fishery, sometimes outside the sector entirely). This is also the time of year for weddings and pilgrimages when the demands of marine and agrarian work, like the river's flow, run slack. The tides do always return, of course. And the all-important monsoon does come nearly every year, despite its mercurial timing, variable intensity and "market-moving" drama.

I paint this picture of this relatively remote and "lightly touched" estuary — a soaked and salty interface between land and sea — to demonstrate how specific rhythms and vagaries of oceanic forces and seasonal hydrology can and do interweave with and co-produce coastal life and livelihood in India. The tidal retreat unveils not only the Aghanashini River estuary's physical topography but also what I argue is the estuary's wide social (wet)landscape and its abundant, persistent, "*peasant*" economy and ecology.

My collage of scenes portraying a dynamic, robust, small-scale agrarian economy and ecology stands notably in contrast to dominant, external narratives about India's rural coastline. Elite (mostly urban) imaginaries and official development policies have long ignored dynamic coastal social ecology and derided agrarian economies as "backwards" and non-modern (Bene 2003; Jadhav 2018; see Platteau 1984 and Subramanian 2009 for this discourse at work specifically South Indian fishing communities). In these discursive framings, fishers, farmers and other small-scale producers and harvesters appear as stubborn holdouts or vestigial relics who refuse to accept the presumed demise of their peasant lifestyles and livelihoods. Such rural producers and communities supposedly resist all attempts to "improve" their lands or fishing and farming methods; they work against conservation and despoil their own environments. They block projects that would bring jobs and industry that will "develop" the nation. They supposedly lack entrepreneurial spirit, thrift and economy. They live without comfort, subsist on bare means and fritter away their meagre resources.

These elite and external analyses often fail to comprehend either the dynamism of agrarian ecologies and economies or the specific sociopolitics and structures such as caste/class that specifically configure any given geography. In effect, this biased narration problematizes agrarian livelihoods and ecologies as backwards and uniformly so, rendering them in need of and amenable to technical interventions (N.B. Li 2007). Public policy "solutions" are almost always the imposition of supposedly "sustainable" (sometimes international) projects and programs, ranging from toilet building to cold storage to rural broadband internet access to subsidized machinery,[1] replaying what Cowen and Shenton (1998a; 1998b) identify as the "agrarian doctrine of development." Meanwhile, the de facto outcome of (immanent) capitalist development for many coastal producers has been stolen or fouled fishing grounds, wetlands and the commons, along with heightened inequality and the precarity of land rushes, state appropriation and reproduction squeezes (Ali et al.

[1] Upon hearing talk of "solutions," one of my interlocutors once poignantly asked: "But what is the problem that needs solving?"

2021; Kanan et al. 2020; Research Collective 2018). Along India's coastline, such "development" also increasingly appears under the sign of the "Blue Economy," a global oceanic policy, political and political economic agenda and discourse (cf. Silver et al. 2015; Carver 2019; Childs and Hicks 2019; Mallin and Barbesgaard 2020; **Chapter 4**).

Throughout this dissertation, I drawing on 20 months of NGO-based research and activism to interrogate the Aghanashini River estuary as a coastal and estuarine "political ecology" (Peet and Watts 1996, 2002; Peet, Robbins and Watts 2011), configured by power, history and the material vagaries of oceanic, estuarine and riparian natures. Here, fishing and farming villages set around mangrove-dominated backwaters have for decades weathered periodic attempts by the state, entrepreneurial capital and civil society to foster "improvement" of local economy, natural resources or both. Efforts since the 2000s include a state-led proposal to convert shallow fishing grounds and oyster beds into an international industrial shipping port as well as a "successful" public-private mangrove afforestation drive that has increasingly colonized fishing commons. The estuary region has also seen multiple aquaculture booms in recent decades in addition to the steady creep of coastal "eco-tourism.

In this chapter, and **Chapter 3**, my research and analysis takes aim at prevalent imaginaries of these rural, coastal producer communities as desperately poor, naively regressive or aligned against long-term sustainability or conservation. I provide a contrary empirical picture of an actually existing peasant ecology and economy dominated by diverse agrarian livelihoods and a more-than-market production. Households of the estuary generally claim sufficiency, and while many notably demand "development" of some kind they also remain skeptical of capitalist transformations, eschew permanent out-migration and refuse outright state-led industrialization. I suggest this resistance to mainstream "development" animates/is animated by a *politics of abundance,* directly informed by households' contemporary agrarian reality. The rest of this chapter explores the Aghanashini estuary of theory, geography and history, before turning to a discussion of practical, political and even epistemological considerations.

What we talk about when we talk about peasants

Before proceeding further, some clarification is necessary: I use the term "peasant" to refer to members of a (mostly) agrarian subaltern class vested in other-than-market relations between/among its members, other social/economic classes and, importantly, with terrestrial, estuarine and marine ecologies and non-human "natures." In this paper, the "peasantry" is explicitly not ambiguous, static, passive or ambivalent. Nor do peasants operate without logics, ideas, cultures and internal and external social relations. Neither are they vestigial or automatically surplus. Instead, I adopt the critical agrarian studies deployment of the category of "peasant" as always geographically and temporally particular, (re)constituted dialectically in relation to/with colonial/imperial and capitalist projects.

Such a framing is hardly mainstream in global (as well as Indian national) policy, political or political economic circles. Instead, multiple veins of development theory and practice tend to discursively produce the peasantry in the negative: non-modern, anti-progress and

apolitical. In this narration, the peasantry must "naturally" decline as urbanization and industrialization organically entice labor away from the drudgery of the countryside and raise living standards with new, better employment and commerce; land, ecology and their productivity meanwhile are freed for "improvement" or extraction by/for capitalist profit such that newly cheapened agrarian produce can be fed back to cities. Diverse thinkers from Lenin (1956) to Rostow (1960) — and their intellectual lineages — have found the peasantry's continued existence incompatible with or an obstruction to the inevitable development of capitalism. Multiple doctrines of development (Cowen and Shenton 1996) have more or less embraced this telos and it pervades many contemporary "sustainability," planning, "green" "smart city" discourses today. Historical agrarian transformations have, of course, never been as neat, and the ethnic and class divisions of the countryside further complicate what actually happens to which (sometimes fractional) peasant. That many Global South rural producers remain stubbornly attached to and wary of alienation from their environments nonetheless seems only to confirm, the "backwards" character of the peasantry (Jadhav 2018, on Indian fisheries specifically). While Marxists more frequently identify this trend of urbanization and industrialization built upon the extraction from and dispossession of peasants, who nonetheless remain a vestigial, ambiguous "sack of potatoes" with little to no political potential nor integral role in the proletarian struggle; worse, they might even be an active obstacle to the revolution (Marx 1852, the epigraph of this paper; see also Hahamovitch and Halpern 2004). One broad point of agreement then between many (neo)classical, (neo)liberal and (neo)Marxist thinkers is a belief that peasants today — if there are any left — linger as amorphous and inconsequential if somewhat mysterious groups largely disconnected from the motor of history. The destiny of this "great mass" (again, Marx 1852) is inevitable depeasantization and proletarianization — the ultimate subsumption of their land into and labor into circuits of agrarian capital.

Rather than simply foretelling peasant extinction, a rich body of critical agrarian scholarship has concerned itself with the contingent / open-ended fate of peasant social, political and economic formations past and present and their different "paths" or "roads" of "development," only some of which have wended their way to a clearly capitalist agriculture (Lenin 1956[1899]; Wolf 1966; Kautsky 1988 [1899]; Luxemburg 1913; Chayanov 1925; Shanin 1971; Goodman and Redclift 1982; Patnaik 1986; 1987; Cooper et al. 1993; Chari 2004; Akram-Lodhi and Kay 2009; Levien, Watts and Hairong 2018, Akram-Lodhi, Dietz, Engels and McKay 2021, among many others). Hardly limited to tracing the political economy of "agrarian transitions," other critical agrarian scholars (and fellow intellectual travelers) have studied (and even participated in) myriad facets of peasant culture, cosmovision, economy, ecology, sociologies, politics, social movements and more. In this tradition, my research foregrounds the politics, interests and social ecology and economy of what I regard as a 21st-century peasantry (Patnaik, Moyo and Shivji 2011; Moyo, Jha and Yeros 2015). Yet arguing that the small-scale agrarian producers of the Aghanashini estuary can be helpfully analyzed and even politicized does not mean I am oblivious to scholarly as well as urgent practical "agrarian questions" over the fate of globally "disappearing peasantries." Small-scale fishers, farmers and foresters globally face multivariate forces of agro-industrial capitalism, rural neglect/sacrifice, large-scale land grabs and dispossession, emptying of the seas and despoilation of all commons (cf.

Bryceson, Kay and Mooij 2000). These diverse but interrelated crises have become practically endemic across agrarian geographies, but an insistence that peasant economies and ecologies can and do persist — and that households and communities might actively defend them — does not amount to selling "cruel fantasies" or romanticizing rural poverty, as some cynical defenders of capitalist agriculture claim (cf. Smaje 2023). I will readily accept the criticisms that I am "taking the part of peasants" (e.g. Bernstein 2010). My analysis also departs from that of scholars who see the category of "peasant" as no longer useful analytically and perhaps even politically (e.g. Bernstein 2006; Watts 2009 provides a good on-ramp to the lengthy debate on how to understand agrarian producers). However, my deployment of the term peasant should not be mistaken as rendering the Aghanashini's interwoven economy and ecology as some idyll of social and environmental harmony disconnected from broad and disconcerting trends of agrarian development and crisis. It is precisely this widespread pattern of sacrifice of agrarian life and livelihood (most often in the name of development) that sets the stakes for understanding the estuary specifically as peasant "political ecology" (c.f. Peet, Robbins and Watts 2011).

Concretely, I am reporting research on a rural, coastal ecology and economy that today is only partly penetrated by cash exchange, wage labor and liberal, competitive economic logics. Around the Aghanashini River estuary, significant portions of household focus, effort and labor time each day — and nearly all daylight hours at critical moments in some seasons — remain dedicated to diverse forms subsistence production. Households do this not as mere strategy for survival but as traditional practice that keeps alive the question of whether they are more than mere petty commodity producers (N.B.: Harriss-White 2023). Agrarian livelihoods also require at least periodic coordination across groups of households and draw on social/communal traditions — e.g. for sharing labor or draft animals or making collective decisions about when to drain fields or when not to fish because of weather. Households often further socialize windfall harvests and bumper crops, effectively (re)distributing agrarian surplus through formal and informal kin/caste/community groups, networks, "organizations," producer co-ops, and the like, creating a kind of peasant moral economy in the process (cf. Scott 1976). Regional and seasonal folklore, mythology, festivals and celebrations — Hindu, Muslim, Christian and even pantheistic/locally syncretic — further socialize households and hamlets into villages, panchayats, blocks, regions and so on, all structured conditioned by biology/ecology/climatology. Furthermore, these not-fully-capitalist modes and socialized relations of production ardently persist alongside and even resist capitalist agricultural development today. I argue the actually existing peasantry described in this paper stands as contemporary rebuttal to Marx's "sack of potatoes" model, which has all too often (re)inscribed the telos of agrarian transition (cf. Goodman and Redclift 1982), foreclosing peasant possibilities along the way.

The estuary's relational (wet)landscape

Flowing out of the Western Ghat mountains, the Aghanashini River gathers strength from myriad small tributaries running through jungle and across plantations before it spills out onto the small coastal plain of northern Karnataka. There, the river passes paddy fields, aquaculture ponds, jetties, village centers, clusters of homesteads and innumerable swaying coconut palms, drawing ever closer to the sea. Patches of mangroves appear on

embankments as soon as the salty wash of ocean tides can be reliably felt; for roughly the last 10 kilometers of its run, the river is brackish year-round, braiding among islands large and small, swamps, fishponds, salt pans, rice fields and other estuarine habitats. Before it reaches the sea, the Aghanashini widens into a shallow, "natural harbor" of mudflats, sandbars, anchored fishing nets, moored boats and extensive stands of mangroves, all sheltered by the rocky headlands guarding the river's narrow mouth.

Roughly 14,000 households live in the more than 30 villages that encompass the estuary; its wetlands and surrounding fields, forests, hillocks and swamps account for much of the coastal portion of Kumta *taluk* in Karnataka's contemporary Uttara Kannada District (**Figure 2.2)**. Fishing, farming and other small-scale production remain the dominant livelihoods across the region. Small ocean-going trawlers and purse seiners dock and unload at Tadadi harbor and other jetties in the main channel, while lesser boats and canoes are tied up at small docks and pylons or beached among the mangroves. Many households also claim traditional tenures/rights to *gajni* plots[2] and other aquaculture/fishing ponds adjacent and connected to the river. Apart from the marine and estuarine commons, the majority of cultivated lands remain devoted to peasant agrarian production. Caste, class and other social stratifications do create inequalities and variation among rural communities, though PCF's own research suggests a large majority of Aghanashini households stand with only one foot in the market. Households do produce major crops such as rice (mostly subsistence) and peanut (mostly petty commodity), while traditional agroforestry stands of coconut, areca and fruit trees — all with understory gardens — surround many homesteads. Households also harvest from village and beachfront commons, while other forestlands — including unmanaged reserves, mixed tracts, acacia plantations and cashew orchards — are controlled (and sometimes leased out) by the state Forest Department. Notably, the Aghanashini remains undammed through its course and receives little to no direct industrial or urban effluent. The nearest town centers of Gokarna (a pilgrimage and beach tourist enclave to the north) and Kumta (a trade, transit and government hub to the south) both remain removed by several kilometers from estuary banks and neither hosts significant polluting activities.

[2] *Gajni,* also sometimes called *khar* land in other parts of the southwestern coast, refers to estuarine (i.e., brackish water) flood lands demarcated/protected by embankments, bunds and/or mangroves. Households traditionally held and maintained these plots for cultivation of salt-tolerant rice in the monsoon planting season and small-scale aquaculture or fish trapping/ranching during the remainder of the year. In recent decades, many shallow plots have been aggregated, deepened, used, polluted and ultimately abandoned in the so-called Blue Revolution boom-bust cycle of industrial aquaculture in the 1980s and 1990s (see also Bhatta and Bhat 1998).



Figure 2.2 *— Left: the Aghanashini River estuary (adapted from* ***Chapter 5****). Inset: map of western and southern India; the state of Karnataka appears in black with the estuary marked with a star. Upper right: A family dries* meenu *(fish) from the estuary. Lower right: Fringed by mangroves, the estuary sits at the foothills of the Western Ghats range. Author photographs.*

Dozens of fish species spend parts of their lives in the estuary, and small-scale fisheries for numerous fish, crabs, shrimp and bivalves support thousands of households. More than 100 bird species also reside around or regularly visit the estuary. Mangroves — the dominant habitat fringing the backwaters — provide myriad material benefits and feature prominently in local Hindu traditions; one particularly old stand of mangroves has been protected as holy ecology — i.e., a sacred (man)grove — and temples and shrines are dedicated to a river deity throughout the region (sometimes even honored by local Muslims). A combination of relatively less human pressure throughout the Aghanashini's watershed and *de jure* protections for estuarine habitats in India has resulted in steady mangrove expansion for two decades, a stark contrast to the trend of mangrove loss and wetland degradation globally (Valiela, Bowen and York 2001; Hagger, Worthington, Lovelock et al. 2022). As a result, the Aghanashini is often hailed by environmental activists and conservation scholars as one of the last "unspoiled" and "free-flowing" rivers in India (e.g. Daniels, Chandran and Gadgil 1993; Jojan 2017; Nilekani 2019), with some of the largest contiguous mangrove habitats on the west coast of India. **Figures 2.3 to 2.7** visualize this (wet)landscape, while **Section 5** details PCF's research on this interlaced peasant ecology and economy.



Figure 2.3 *— Upper left: Multiple scales of fishing exist here. Upper right: Cashew is a traditional tree fruit crop. Center right: Women from area households cross a railroad bridge carrying headloads of forest products. Lower right: Mangrove stands provision small-scale fisheries. Lower center: Rice is one of several subsistence grains cultivated across the estuary. Lower left: A small fleet of purse seiners docks in the estuary. Author photographs.*



Figure 2.4 *— Left: A bag net fisher prepares to check nets at low tide. Upper right: An oyster harvester has a good day. Lower right: The river feeds croplands sometimes used to grow salt-tolerant rice. Author photographs.*



Figure 2.5 *— Upper left: The sheltered backwaters have long inspired planners and officials to dream of industry in a "natural" harbor. Upper right: A brahminy kite soaring above the estuary is a common sight. Lower right: Trapping and ranching in ponds along the river's edge is a traditional method of harvest. Lower left: Goods have long been transported out of India's hinterlands to coastal cities and ports. Author photographs.*



Figure 2.6 *— Upper left: Cashews are an important commodity and subsistence crop across the region. Upper right: The southwestern peninsula of the estuary, where clusters of houses are tucked away mostly under coconut trees, while many fields are planted with peanut for the winter crop rotation. Lower right: In the backwaters, much of the river bank is lined with roads, shops and houses. Lower center: Discarded clam shells will be aggregated for use in lime production. Lower left: Pre-independence salt pans draw from the estuary's brackish water. Author photographs.*



Figure 2.7 *— Upper left: Thick stands of mangroves line islands and embankments throughout the braiding channel. Upper right: Estuarine traditions include cobras in a sacred pantheon. Lower right: Old mangrove swamps are noted sacred groves. Lower left: A spectacled cobra hides in mangrove pneumatophore roots. Author photographs.*

Together, the river, estuary and ocean create a complex, multi-scalar hydro-ecological regime that provision what various scholarly and policy literatures call "ecosystem goods and services," including fish nurseries, storm breaks, water filtration and even socioecological *culture* (Boominathan et al 2008; Stone 2008; Chandran et al. 2012; Bhat 2014). In 2017, with other remote sensing scholars, I estimated that the annual value of these environmental goods and services — what we might think of as the Aghanashini River estuary's ecological abundance — could be equivalent to roughly $250 million,[3] far more than regional GDP (**Chapter 5**).[4] While such valuations and comparisons can and

[3] 2015 dollars.

[4] Estimates from Indian Institute of Science scholars suggest our valuation is quite conservative (Ramachandra, Raj and Aithal 2019).

should be problematized,[5] they nonetheless provide evidence — spoken in the language of monetary metrics legible to policymakers — of the myriad relations and dependencies among human- and non-human natures.

I do not, however, mean to suggest that this stretch of the coast should be interpreted as confirming or conforming to the stereotype of static peasant idyll, locked in timeless state of "pristine nature." Though industrial effluent is absent from the Aghanashini, control, management or treatment of most forms of pollution — non-degradable garbage, sewage and engine oils, among others — remain as scarce here as anywhere in rural India.

Nor is it isolated from the world or otherwise awaiting the arrival of — or perhaps conquest by — development or "modernity."[6] To be sure, the estuary remains geographically remote today; Bangalore, Karnataka's state capital, is still a torturous overnight bus journey that winds over and down the Western Ghat mountains, or a longer train ride that can easily stretch beyond 24 hours during delays. Yet if you could look closer at my mental images above, you would begin to see everywhere hallmarks of connection to regional, national and global economy and society. Mobile phones are abundant across class, communities and age. Petty shopkeepers and producers who sell parts of their harvest for cash also routinely use India's national digital payments system, for even the smallest transactions.[7] Cross estuarine community members actively participate in local Facebook and WhatsApp groups. Local schools still send "toppers" to regional and national colleges and universities. Vehicles of all sizes, wheel-counts and luxury can easily be found if in less abundance than the state's capital, Bangalore. Some "small" fishers and farmers also readily adopt new commercial equipment and technology — tractors, seed drills, fiber hulls, synthetic nets, cell phones, the Internet (including YouTube) — if they can afford or when it makes productive sense.[8] Because of sporadic electric outages, candlelight remains frequent in households that can't afford a battery back-up or generator, just as in many of the country's largest cities, though when the power is on the glow of televisions lights homes large and small. Except during the worst monsoon storms, wired and cellular high-speed internet allows wealthier households to stream Netflix, and young people to live global digital lives from their fishing villages, or just watch porn. Amazon will fight with its competitors in India to satisfy all local shopping needs, perhaps with some delivery delay.

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[5] Our analysis produced an ecosystem service valuation in the context of public protest and local campaigning (mostly) against the industrial shipping port. We argued for the political potential of such methods, while still acknowledging — and often agreeing with — the robust literature critical of both the ecosystem services paradigm and the methods of quantitatively valuing "nature" (**Chapter 5** offers a brief introduction).

[6] This perspective is articulated by the (mostly) urban elites discussed in **Chapter 3**, though I have also heard this in interviews from contemporary fisheries administrators, scientists and development officers, in offices in Mangalore, Bangalore, Mumbai and Delhi.

[7] The stories of "demonetization" mandated by the Indian government, the incredible toll it took on peasant and proletarian alike and the even more fantastic benefits it provided to merchant and financial capital are beyond the scope of this paper. Fouillet, Guérin and Servet (2021) offer critical context and evaluation.

[8] New-fangled gear often doesn't, and peasants, simply put, aren't dumb. I know more farmers in Aghanashini who chose to rely on their cattle for ploughing and manuring the fields, than those who pay for either machine power or chemical fertilizers (even some who could afford it). I also argue in this dissertation that the estuary's productive lands and waters provision a level of subsistence comfort that further reduces pressures to scale up, farm for cash or gamble on expensive experiments.

Historical framing of the estuary

On critical reading, the Aghanashini's remoteness is as mythic as it is literal (or littoral). Indeed, the imaginary of marginal agrarian communities, underdeveloped and of no historical consequence, is itself a discourse penned by elite and external authors. Perhaps peripheral *at times* in policies and imaginations of both colonial and postcolonial rulers, this thin liminal strip of land and water wedged between sea and mountain nonetheless appears *at times* in a global history that even predates encounters with European colonizers or the conquest, congealing and production of India (cf. Bhattacharya 2019; Goswami 2004). I do generally follow the critical geographer's insistence on expecting/looking for global interconnections and relations across space and time, decentering and dethroning the colonizer's world view that holds European expansion as the engine of modernity (Blaut 1993). A *relational* frame of analysis (Coronil 1996; Hart 2006, 2018) further helps to avoid reinscribing the Orientalist and Occidentalist gaze and logics of both colonial anthropologists-cum-bureaucrats (Jadhav 2022) as well as postcolonial (high) modernizers who have routinely declared rural and agrarian peoples to be backwards and, without development, stuck in (or even lingering outside) the waiting room of history (cf. Scott 1998; Jodhka 2002; Rignall and Atia 2017).[9] Contra the idea of a "people without history" (Wolf 1982), I offer an abbreviated, "momentous" accounting of times when the Aghanashini Estuary and the wider coastal plains of today's Uttara Kannada District have indeed entered into the historical record in ways that are far from inconsequential.[10]

Historians have documented interchange among peoples from contemporary Africa, the Middle East and South Asia. Evidence suggests that human migrations along with plant and animal transfers have occurred around the Indian Ocean rim since at least 2500 BCE (Fuller 2006; Rangan, Carney and Denham 2012), creating a kind of ecological imperialism (cf. Crosby 1986) long *before* European arrival or the parceling of landscapes into the fiefs, kingdoms and eventual nation states familiar from recorded history. Scholarship further suggests this movement and intercourse happened on land, in shallow coastal waters and even sailing across the open sea (Rangan, Carney and Denham 2012), producing over the *longue durée* the nested geographies of estuaries, harbors, bays and gulfs, organized as much around the *oceanic* vagaries of the South Asian monsoon as the affairs of *landed* territory (cf. Braudel 1972). So much does Indian Ocean life and livelihood depend on this climatological-hydrological cycle and its planetary weather teleconnections (Shekar et al.

[9] When I speak of colonialism, unless otherwise indicated, I am referring chiefly to the British project to conquer, subjugate, extract from and sometimes resettle people and places across the non-European world (and substantial parts of the European world that existed as peasant hinterlands for emerging cities and capitalist economies). At least some of those colonies remain in operation today (e.g. the disputed British Indian Ocean Territory, which currently hosts Naval Support Facility Diego Garcia). There is, of course, another, more encompassing and capacious definition of colonialism as the *land relation* that justifies and maintains dispossession and occupation of Indigenous lands and waters. That land relation is today the *sine qua non* and unspoken assumption of all manner of settler society/culture/power (Liboiron 2021).

[10] This paper, however, is not a historiographic intervention (e.g. Guha and Spivak 1988), an ethnohistory (cf. Dirks 1987) or deeply personal, relational history made possible by narrating one's own place (Das 1987). In this section, I simply wish to highlight the threads of history (including the precolonial) of a people/place often presumed to be without one.

2022) that Hall (1996) deems the millennia of Indian Ocean rim exchange of goods, ideas and people as tantamount to "empires of the monsoon." The most robust trade and migratory networks would last until (and in some cases after) the 17th century CE when European imperial meddling and profiteering in South Asian waters began in earnest (Das Gupta 1967; Chaudhuri 1985; Ho 2006; Pearson 2003; Ray and Alpers 2007; Bose 2009). Colonial power and the rise of steam shipping in the 19th century would further remake the Indian Ocean and reduce merchant capital's dependence on monsoon energies, though mercurial seas and malevolent weather still assert themselves today, and rural South Asia's economy and ecology — including that of the Aghanashini — remain very much subject to the monsoon's "unruly waters" (Amrith 2018).

Local written Hindu traditions date at least to the 4th century CE, identifying the Mahabaleshwar temple at Gokarna just north of the estuary as a popular pilgrimage site. At this time, the wider region was the seat of power for the Kadambas, sometimes regarded as the originators of a Kannadiga/Karnataka historical identity. A shifting patchwork of kingdoms and fiefs would control what is largely the Uttara Kannada District of today, until nearly all of the subcontinent south of the Krishna-Tungabhadra doab was incorporated into the Vijayanagar Empire (Naik 2014; Bhat and Naik 2013; Bhat 1998, 2001). Global travelogues from Muhammad al-Idrisi, Yaqut al-Hamawi, Marco Polo and Ibn Battuta describe ports of contemporary Uttara Kannada — Honnavar, Bhatkal and others — as nodes in a vibrant oceanic trade, while Netrani Island off the coast is mentioned in the *Periplus of the Erythraean Sea*.

The Aghanashini estuary itself appears in these histories as a productive wetland and sheltered harbor providing a critical link between already global oceanic trade and small peasant producers and montane estates. For example, oral histories and colonial gazetteers recall Rani Chennabhairadevi, the 16th century CE queen who ruled a "little kingdom" within the empire of Vijayanagar from the still-standing historic stone fort at Mirjan, where the Aghanashini beings to meander and braid. Regarded as India's longest ruling queen, she held back early Portuguese influence in this spit of coast and for some five decades successfully controlled pepper exports to European *dis*advantage; the Portuguese nicknamed her "Rainha de Pimenta" (Campbell 1883). The ruins of a second stone fort, Rajamundroog, purportedly an outpost of Mirjan, still sit atop a large promontory guarding the river mouth, and today, local families graze cattle and harvest meadow grasses and cashews inside the crumbling ring wall.

As Vijayanagar declined in the 1500s CE, Bijapur, Sonda, Keladi, the Marathas and others powers at least nominally ruled the north Karnataka coast through the 17th century CE, even as Europeans traders, armies and states increasingly inserted themselves into economics and politics (Naik 2014). Apart from the Portuguese, sitting directly to the north in Goa, the Dutch also took interest in the pepper, cardamom and other spices from the region. The region's exports — including spices and textiles) would also attract a British trading company *not* named the East India Company (EIC). In 1638, with a grant explicitly from Charles I, the Courteen Association established a factory on the Kali River at Kadwad, a few miles from Uttara Kannada's contemporary district headquarters, Karwar. Though largely a commercial failure, the association also had "factories" at Honnavar and Bhatkal

ports, playing the role of antagonist to the East India Company. After the English Civil War and the execution of Charles I, Cromwell ultimately forced Courteen to merge with the EIC as the latter increased its reach across India with renewed royal trading rights.

Expanding from mercantile trade ("buying cheap and selling dear") to grow its extractive enterprise repeatedly brought the British into military conflicts against both South Asian polities and European competitors (in particular, the French). After becoming tax farmers in Bengal, the increasingly dishonorable East India Company continued to diversify its portfolio, morphing at times and places into a rather dis-"honourable company" of conquering bureaucrats, (ill)liberal planners, duplicitous diplomats, governors by proxy or de facto landlords, guided by both profit and Orientalist and Occidentalist logics (Dalrymple 2019; cf. Keay 1991). The Western Ghats mountains would help to insulate Karnataka's narrow coastal plain — by then known as Kanara — from these power struggles until new South Asian rulers ascended in the inland kingdom of Mysore: Haidar Ali and his son and successor, Tipu Sultan. This father-son duo would pursue their ambition of ousting the EIC from Indian soil through a combination of military prowess, industry, modernizing governance, an alliance with the French and territorial expansion in search of resources and strategic geographies in the second half of the 18th century.

Taking control of Kanara in the 1760s, then, offered Ali and Sultan productive lands, established ports for trade and specific military objectives. The sheltered backwaters of the Aghanashini estuary, the Mirjan fort and its coastal battlements would provide returns from spice exports and land rents from a prosperous region as well as sailors, boat builders, and a drydocks sufficient for outfitting naval ships (Campbell 1883; Naik 2014). Here again, this supposedly isolated stretch of coast populated by peasant producers outside history would come appear far more central to world historical affairs. During the Second Anglo-Mysore War, in late 1782, British commanders at sent contingent of Bombay Marine down to the Kanara coast to create a threat from the west that might pull Mysore forces away from their assaults on company territories on the eastern Coromandel Coast. Their first target? The Aghanashini estuary, where Mysore operated a shipworks guarded over by the coastal bastion Rajamundroog and the stout Mirjan fort upriver, both which had held back Portuguese spice adventuring two centuries before (Campbell 1883; Naik 2014; Riddick 2006). Haidar Ali's death weeks before had pulled Tipu Sultan's attention away from the coast, and resistance was light (Price 1839); Rajamundroog and Mirjan forts fell, and EIC forces also burned a 50-gun ship under construction at Tadri. From these footholds, British troops and ships turned attention south to the ancient trading port of Honnavar on the Sharavati River where Mysore held a strong fort, but the EIC also had a factory with small batteries.

These and other Kanara possessions claimed by the British would be returned to Tipu Sultan in 1784, when the Treaty of Mangalore settled the conflict *status quo ante bellum*. In subsequent wars, the EIC continued to buy or bully allegiances from other Indian powers, while Tipu Sultan repeatedly courted French support, including making direct appeals to

Napoleon Bonaparte. The threat[11] represented by this last overture motivated the company to assault Tipu's capital Srirangapatnam, kill the rebellious sultan and assume suzerainty over Mysore as a future princely state.

The EIC and the making of colonial India

A more revealing or lively history of how the Karnataka coast came to be under the aegis of the British East India Company is beyond the scope of this paper. Instead, I have offered this abbreviated account primarily as context for what happened next: an episode where this supposedly disconnected, insignificant region would have an outsized impact on the affairs of the entire subcontinent. With Tipu's death in 1799, the EIC claimed Karnataka's coast and created an administrative territory named Kanara, which encompasses contemporary Karnataka's three coastal districts. Who would serve as Kanara's first collector, tasked with settling and assessing the post-war, post-Tipu landscape of restive petty lords, chiefs and peasant producers, made all the more remote by a mountain range to the east, the ocean to the west, and cross-hatched with rivers and wetlands?

A young Thomas Munro, still two decades removed from the Munro who, as governor of the Madras Presidency, helped lay the foundations of what would become the British colonial state (Stein 1989).

As the EIC turned increasingly to taxation of acquired territories for steady profits, debates in the 18th and 19th century raged among British political, aristocratic, intellectual and investor classes about the best way to maximize extraction of profits from India (for company and crown), while still encouraging the formation of a capitalist class willing to buy, sell and invest in land's "improvement." Policies in Bengal would make the *zamindari* landowner class responsible for collecting permanently fixed duties for peasant producers, effectively leaving in place feudal lord-tenant relations. Munro and others, meanwhile, argued for, refined and enacted an alternative governance system — what became known as the *ryotwari* — where the colonial state would collect moderate, revised land revenue directly from the *ryot* (peasant). The complex justifications and impacts of these and other "rule(s) of property" (cf. Guha 1963) — all integral to the creation of India through British conquest of *space* — have occupied generations of scholars (Jazeel and Legg 2019). Munro's legacy itself has multiple historiographies (Gleig 1830; Beaglehole 1966; Stein 1989) though they largely agree on at least one point: Munro's first collectorship in Kanara crucially shaped his thinking about the best strategies to bolster Britain's colonial fortunes and rule its new colonies. Consider Munro's letter in 1801 to a retired mentor, several months after leaving Kanara (Gleig 1830):

> "By means of a variety of [local historical records], I traced back the existence of landed property above a thousand years. And it has probably been in the same state from the earliest ages; the inhabitants having so great an interest in the soil, naturally adopted the means of preserving their respective

[11] Dirks (2001) describes EIC's future suzerainty at this point in history as "highly fraught. The Mysore rulers Haidar Ali and Tipu Sultan had to be engaged four times before their final defeat in 1799, before which many commentators noted the possibility of a very different political future for the subcontinent."

> estates, by correct title-deeds and other writings… Litigations are endless in a country where there are so many proprietors; and [village/community elders] are continually sitting to decide on the rights of the various claimants. Landed property being thus the subject of discussion among all classes of [peasants], every thing relating to it is as well understood as in England. The small landlords are probably as comfortable as in any country in Europe. The never-failing monsoon, and the plentiful harvests of rice, far beyond the consumption of the inhabitants, secure them from ever feeling the distress of scarcity Rents are therefore easily collected — no complaints about inability — no absconding at the close of the year… The landlords of Canara are, I am convinced, fatter in general than those of England."

Far from encountering a regressive, static peasantry locked out of time or in thrall to local despots and elites, Munro found in Kanara what he thought could be the Indian basis for the development of agrarian/landed capitalism:

> "In Canara, there is already established to our hands all that the Bengal system, supposing it to succeed according to our wishes, can produce in a couple of centuries — a wide diffusion of property, and a permanent certain revenue, not only from the wealth of the inhabitants; but also farther [sic] secured by the saleableness of land."

Put another way, the future governor of the Madras Presidency "would not be able to look at any district without measuring it against Kanara" (Beaglehole 1966: 54).

The remaining story of British colonial Kanara in general, and the Aghanashini Estuary in particular, is a task for another day. We could read travelogue and catalogue and innumerable other reports, articles, missives and bulletins compiling data, records and surveillance required by the emergent colonial company state to govern its conquered resources and peoples. For example, Mackenzie (Wilson 1828) and Buchanan (1800, 1801) both surveyed Kanara; Buchanan himself camped at multiple locations around the Aghanashini estuary, which he noted "abounds with fine oysters" (1801: 152). We could certainly hear how old and new trade routes, harbors and patterns continued to deliver the region's produce of spices, foodstuffs, cottons, sandalwood and more to subcontinental and global markets; in 1862 during the American civil war, for example, the Bombay Presidency took control the northern division of Kanara (today's Uttara Kannada district) with an eye to expanding cotton exports via the port at Karwar. The southern half of Karnataka's coastline would remain under Madras rule, further constructing this geography as a liminal satellite at the border between two Presidencies, peripheral to either colonial Metropole.

We would certainly see the British plan to force sales play out as even the `fat landlords and comfortable peasant proprietors observed by Munro would struggle to keep up with cash revenue demands, pushing the most marginal into landlessness. Naik (2014) narrates how the combined squeeze and neglect of colonial administrations ripened the northern Kanara region for anti-colonial politics. If we listened carefully enough, we could hear the slow crescendo of resistance and emergent peasant politics across the region (see also Bhat

1989). The 1887 Kanara Forest Grievances Association offers an early example of local institutional opposition to British land policies. By April 1930, a mature peasant resistance would display both discipline and a grand sense of political theater as 3,000 Gandhian "volunteers" carried *matkas* of seawater to a local government headquarters, where they proceeded to make and auction salt in defiance of government monopolies.[12] The din of rebellion would only grow louder in Kanara during the no-tax campaigns of the 1930s and the more radical student strikes, colonial document theft, cutting telegraph wires and road burning of the 1940s.

Colonial developmentalism — especially infrastructure projects of roads and railroads — largely skipped Uttara Kannada, adding to mounting rural immiseration and a narrative of "underdevelopment."[13] Since independence, the estuary region has remained a literal, littoral and metaphorical backwaters in the eyes of government planners, politicians, bureaucrats, scientists and entrepreneurial capitalists. The region's continued "low" level of economic industrialization appears as the hallmark of underinvestment and underdevelopment. State-produced reports that measure Karnataka's "development" find Kumta *taluk*[14] to be a middling *taluk* in a middling district, in terms of economic performance (GoK 2015b; 2022). This "condition" of underdevelopment in many coastal districts, according to official numbers, animates all manner of public and private proposals allegedly to alleviate rural immiseration that at once reinforce state authority and paint the Aghanashini as in need of, in effect, industrial capitalism. Multiple state and central government agencies actively court capital to the region for mega projects (i.e. a shipping port) and micro-development (i.e. homestay tourism via individual Airbnb rentals). Simultaneously and contradictorily, the estuary also serves as terrain and territory for the exercise and (re)production of the power of the environment-making state (Parenti 2014). State forest management bureaucracies, scientific institutions and conservation regimes exist specifically for the study, protection and propagation of wetland habitats protected under Indian federal law; this invests them collectively with authority to prioritize putative national goals of, for example, mangrove afforestation, further setting up conflicts with fishers and other traditional estuary users.

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[12] Stay absolutely quiet and you might even catch the whispered plotting to avenge the arrests of marchers that followed the salt *satyagraha*. Not a month after the salt-making demonstration, a decidedly rowdier crowd raided the Government-appropriated Sanikatta saltworks, which use brackish water directly from Aghanashini estuary. Naik (2014) provides a fascinating oral history of this and other anti-colonial action across Kanara, and her interviews recount how early in the morning of 12 May 1930 more than 1,000 peasants swarmed the saltpans and godowns from all directions, bewildering armed police before making off with headloads of salt.

[13] Geography of course continued to play a role. The rivers, wetlands, backwaters, jungles and mountains that presented difficult terrain to early colonial authorities and surveyors (e.g., Munro) also delayed the construction of motorable roadways and a railroad line. Until national highway construction began to connect Mumbai and Mangalore in the 1960s, coastal ships remained the primary means of interconnection between small harbors and lighterages; the portion of railway line linking Uttara Kannada to both Mangalore and Goa only began operating in the late 1990s. Thomas (1985) offers a more detailed history of rural road building as an anti-poverty program in India.

[14] An administrative, legal and political unit somewhat akin to a county in a U.S. context. Kumta taluk's population in the latest central government census in 2011 was 150,000. Uttara Kannada District is the next largest administrative division, encompassing several taluks.

Research design and epistemological framing

The data reported and analyzed here are drawn from roughly 20 months of fieldwork conducted while I managed research and programming for the Panchabhuta Conservation Foundation (PCF), a fledgling environmental non-profit NGO, situated in a beachside hamlet just south of the Aghanashini River mouth. PCF's founder-director, a retired businessman then residing in Bangalore, hired me to scope projects and advocacy around sustainable development, environmental education and conservation, while also conducting baseline socioecological research. From January 2015 to August 2016, I trained and deployed a rotating cast of assistants, translators, project fellows and local student interns for much of this work. PCF's practical programming included: birding hikes, a schoolyard garden and an after-school eco-club for local children; classes, field excursions and seminars for NGO workers as well as college students; agroecology and permaculture demonstrations and trainings aimed at farmers, entrepreneurs and architects; and direct analysis and advocacy on local issues including (un)sustainable development, waste management and environmental protection (especially of estuarine mangrove swamps). In research, we canvassed the region through interviews, surveys, photography and mapping exercises; our topics ranged from drinking water provisioning/use to agroecological practices to traditional medicine cultivation to environmental politics. We operated with the explicit intent of informing and guiding our own participatory NGO projects and activism, and we collaborated periodically with other civil society actors and scholars locally, regionally and internationally.[15] This paper's analysis draws primarily from two specific PCF research projects: 1) a large-*n* household survey of estuarine villages assessing conservation attitudes, development ambitions, social capital and dependence on estuarine commons (especially mangroves); and 2) an agrarian producer/harvester catalogue and calendar, aimed at establishing the extent and seasonality of production for both subsistence and market uses.

The research methodologies, questions and data under analysis here reflect foremost the realities, needs and demands of PCF operating as a newcomer in the estuarine community, a kind of charity-in-retirement, non-profit venture founded by an Indian businessman and staffed by a skeleton crew without even a Web site. Our research was *always* "applied," intended to support an organization functioning at that time in an exploratory mode — i.e. still seeking what kinds of projects, politics, enterprises and experiments might be possible under the broad rubrics of "sustainable development" and "conservation." To this practical NGO context, I also brought multiple intellectual and political commitments common to the overlapping fields of scholarship and activism known as political ecology and environmental justice (cf. Harvey 1996; Holfield, Porter and Walker 2010; Reed and George 2011; Robbins 2011). These have been refined through further graduate study and research but they remain no less important.

First, PCF's work followed a critical geographic insistence that *spaces* and *places* — and the variations, differences and relations within, across and among them — matter

[15] References to "we" and "our" refer to PCF's research staff, recruited from environmental civil society networks in Bangalore as well as schools and colleges near the estuary.

foundationally in producing social, political, economic and ecological life and livelihood. From this point of view, "the environment" is a terrain of vitality, meaning and struggle, configured unevenly by social hierarchy and inequality but also a potential wellspring for liberatory or emancipatory politics and praxis (cf. Massey 1996; Hart 2006; Peet and Watts 1996; 2002; Ranganathan 2017). Coasts in general and estuaries in particular are by definition ecotones and geographies of inter-relation in quotidian/concrete and grand/socio-historical senses. Watersheds empty out of estuaries just as the sea blows and washes in. The opening scene of this paper visualizes the Aghanashini's dynamic social ecology produced in the interplay of oceanic and terrestrial forces — e.g. the meeting of saline tides and freshwater river flows or the battle between an entire watershed's soil deposition and the ocean's never-ending erosion. In the process, a liminal biology and ecology emerge from (also submerge in) the brackish water. Numerous fish species caught in the open ocean, for example, spend some portion of their lives growing in the estuarine backwaters, while many bivalve species can *only* thrive in particular places in the estuary with the necessary combination of soils, nutrients, currents, turbidity, salinity and other biochemical conditions. Coastal and estuarine flora and fauna (as well as the built environment) must tolerate the conditions of seasonal climates, weather patterns and an eco-hydrology that routinely swells, storms, floods and otherwise spills over boundaries (e.g. those between fresh and saline vegetation but also the demarcations of property). What has resulted are diverse yet particular agrarian economies (e.g. traditional fish ranching in combination with salt-tolerant *kagga* rice), architectures (e.g. a coastal style of clay-tile bungalow) and cultural traditions (e.g. an estuarine river deity resident in sacred mangroves). At the same time, estuaries across India's coasts have served as sites of human interaction, mingling, trade and passage (i.e. relation); harbors, docks and ports large and small have been critical to the global movements of people, ideas, goods, militaries, ecologies and, of course, unintended consequences. It is the constant interrelation of these human and non-human natures and histories that dynamically (re)produce coastal and estuarine spaces. The Aghanashini's own past and present, outlined earlier in this chapter**,** suggests the same.

Second, our research was guided broadly by a skepticism and critique of "sustainable development"[16] policy, politics and practice — especially popular iterations and campaigns embraced by governments, industries and corporations. Take the immediate relevant example of the 2014 mandatory environmental impact assessment (EIA), conducted for the proposed Aghanashini Estuary industrial shipping port, which would unambiguously clear hundreds of hectares of mangroves, bivalve beds and fishing grounds while permanently degrading estuarine air and water quality. Despite this ecological sacrifice, the EIA from a central government research institute hails the project as "an example of development in harmony with the nature" (NEERI 2015, 7.8). To make such a claim, the report's authors downplay numerous social and ecological impacts while occluding other effects through publishing selective, misleading and dubious data on local biodiversity and agrarian

[16] An intellectual history of this dyad term is both unnecessary here and beyond the scope of this paper; the many critical entries in *The Development Dictionary* (Sachs 2010) are an excellent starting point, as is Watts' series (1993, 1994, 1996) in *Progress in Human Geography*. **Chapter 4** also offers an abbreviated history and analysis specifically of India's engagement with sustainable development politics and practice.

livelihoods (PCF 2015). Where impacts are acknowledged, the EIA rehearses boosterish promises from government sponsors about mitigation without agreement from the future developer:

> "Adequate budgetary provision shall be made towards implementation of suggested management plans towards control of air, noise & water pollution, solid waste management, green belt development, CSR activities etc. including regular environmental monitoring/auditing and continual improvement leading to sustainable development of the region" (NEERI 2015, 11.6).

These promises are wishfully ignorant — if not simply duplicitous and cynical — and undermined by the material facts of the port project as proposed; simply put, there is no reality where an industrial shipping facility for ocean-going steel and coal freighters coexists "sustainably" with anything like the Aghanashini's mangrove-dominated estuarine, social ecology. Rather than serving as a safeguard required by Indian environmental law, the EIA report for the proposed Aghanashini port *performs* a flexible, ambiguous (potentially rigged or corrupted) claim of sustainability that foremost works to devalue the estuary's ecology and economy and manufacture consent (in a Gramscian sense) for their destruction and sacrifice in the name of national development. Such a compromised sustainability discourse is also increasingly, strategically deployed in India and elsewhere to justify projects under the heading of the Blue Economy (**Chapter 4**; see also Modi 2024). In 2018, after sustained protest and critical analysis (in which PCF participated), the project unofficially entered a bureaucratic stasis, when a review committee of the central government neither approved nor denied environmental clearance permits. However, the recurrent nature of industrial development dreaming in the estuary likely foretells a day when this or another port proposal is brought back in an example of "zombie neoliberalism" (Peck 2010).

PCF's critique of supposedly sustainable development also included proliferating projects and plans (such as those often heralded as part of the Green Economy) that promise environmental protection, stewardship and benefits — sometimes even placing these concerns ahead of costs/profits — while nonetheless ignoring (often being complicit in) social and political injustices. Top-down state-led conservation efforts and middle-class/bourgeois environmentalism can also follow this pattern (cf. Scott 1998; Neuman 1998; Harris 2005; Li 2007; Mawdsley 2004). Instead, we heeded the suggestion of scholars and activists advocating for deep democratization of environmental and development agendas (Appadurai 2002; Kothari 2014). This more "radical" conception suggests that to be *deeply* sustainable, development *also* requires informed consent, inclusive participation in decision-making, transparent processes, an anti-inequality agenda and strong democratic spirit. Put another way, development policy and practice — from local project to global performance standard — that strictly pursue long-term profits and protect ecological health should be considered *unsustainable* if they still ignore social and political injustices.

Third, though nominally a "conservation" NGO, PCF approached this field — like that of

sustainable development — with skepticism and wariness, especially of the (neo)colonial impulses, logics and behavior that often accompany environmental protection. "Conservation" practice, of course, comes in many shapes and sizes, some laudable and all backed up by a range of environmental politics (Guha and Martinez-Alier 1997; Robbins 2012). Yet globally many contemporary frameworks and regulations for managing and protecting ecology, wildlife and "nature" betray coloniality, sometimes even relying on archaic laws, principles, imaginaries and science about the environment leftover from imperial periods (Neumann 1998; Rajan 2006; Rangarajan and Sivaramakrishnan 2012a, 2012b; cf. Drayton 2000); the most relevant example is that postcolonial India largely maintained strict control of forest lands that were seized by the British colonial government. States and their representatives (including NGOs) also routinely enroll or subsidize coercive means — including surveillance, policing, fines, seizure of goods, arrest, beatings and even shootings — on behalf of conservation ends (Peluso 1993; Ybarra 2017; Ramutsindela, Matose and Mushonga 2022). Even when overt forms of violence and destruction are not part of the toolkit, conservation regulations can promote creeping dispossession, exclusion and socioeconomic transformation that amounts to "slow violence" (Nixon 2011). In an argument that resonates globally, Garland (2008, 52) goes further to suggest that wildlife conservation in Africa today "is foremost a productive process, a means of appropriating the value of … nature, and of transforming it into capital with the capacity to circulate and generate further value at the global level." In other words, this appropriation and circulation of value — analytical terms of critical (often Marxist) political economy — of course builds on colonial legacies but it also relies on contemporary dynamics of North-South inequality (frequently domination of the latter by the former) through commodification of nature and the circulation of capital (Castree 2003; Kelly 2011; Büscher and Fletcher 2015). Consider the example of some of the largest Global North conservation NGOs which have been criticized for sidelining the interests of indigenous and local communities while effectively accumulating property/territory, exemplifying a practice of conservation by landgrab and dispossession (Chapin 2004; Kelly 2011). That's not to say that Global South states, organizations, communities and individual do not *participate* and are simply *recipients* of Global North monies, ideas and practices, but unequal power dynamics do reproduce colonial divisions of labor, authority and privilege. As Garland notes,

> "Western scientists and conservationists translate their intimacy with African animals into Ph.D.s, research grants, jobs with international NGOs and tourism companies, academic positions, gigs on the conservation lecture circuit, popular memoirs, starring roles in *National Geographic* specials, and on and on… but the historical and racial politics of the international wildlife field are such that their intimacies rarely translate into the kinds of successes enjoyed by their non-African counterparts and employers." (2008, 67).

I note that these critiques undermine the popular-if-specious binary opposition of conservation vs development, of environmental stewardship vs economic growth (cf. Ramesh 2010). Actually existing public and private projects and plans to conserve or protect wildlife, landscapes or ecosystems function not in realms separate from markets and industry but rather very much within the operating theaters of capital, as part of what

Brockington and Scholfield (2010:570) label as the "conservationist mode of production." This critique situates those government branches as well as private enterprise and civil society groups at least nominally concerned with something called conservation well within "a broader framework of capitalist endeavour, facilitating economic growth, creating new commodities, promoting and legitimizing visions that require considerable alterations of nature and society" (570). As described in brief **Chapter 4**, the success of state-led mangrove protection and afforestation in the Aghanashini estuary — itself one piece in a political economic agenda known in India as the Blue Economy — offers the promise of future increases in *planted* mangrove habitats, paradoxically smoothing sacrifice of actually existing wetlands for capitalist "development." Such a process would present one type of a process Kelly (2011) deems "conservation practice as primitive accumulation."[17] All of which is to reiterate a by now familiar critique that supposed environmental stewardship can enable rather than defend against capital's churning of the earth, blowing up the putative economy vs. environment dichotomy. Drawing on a related line of Marxist thinking (i.e. Harvey 1982), I might suggest that the Aghanashini case demonstrates how capital periodically needs a "conservation fix."

Fourth, and relatedly, we proceeded with a reflexive awareness that development by NGOs (sustainable or otherwise) is itself a contested proposition. Organizations often remain deeply embedded (even vested) in the status quo of neoliberal political economy and its inequalities (Sachs 2010); far from disruptive or transformative, NGOs often model the participation and voluntary association advocated by the World Bank, international aid agencies and economic elites (Rahnema 1990). For critics, then, many NGOs are simply "thoroughly domesticated to the ideologies and agendas of the mainstream development institutions, donors and their client states" (Townsend, Porter and Mawdsley 2004, 872; see also Wallace 2003); apart from representing a kind of elite capture, this trend suggests that one key NGO function today is to smooth the displacements and hardship brought on by capitalist transformations and industrialization, provide financial integration, (re)skill workers, impart economic ideologies and otherwise maintain a ready, disciplined supply of labor and/or natural resources. This alignment of NGO work to dominant political economic interests also can reinforce existing inequalities, precisely by not disrupting status quo hierarchies of race/caste, gender, class, etc. Even when NGOs objectively provide broad, inclusive social supports and advocacy, much of this work takes the place of state and public safety nets in the global age of neoliberal austerity, in what "amounts to privatization by NGO" (Harvey 2005, 177). Put another way, NGOs, representing a voluntary and often elite-driven civil society, run risks of being co-opted by a wide array of interests and less often work with robust downward accountability or democratic consent.

I do not mean that NGOs can *never* provide rich spaces and organizational forms for radical

[17] Drawing on a Marxist tradition, Kelly argues that capital, capitalists and their allies — in different time-spaces — periodically require and enact theft, dispossession and other forms of violence (of varying sorts) to force into circulation or otherwise create/preserve economic "value" of labor and nature; seen critically, conservation too can offer a form of violence that does work *for* capitalist accumulation now and in the future, whether through genetic storehouses that "save" biodiversity for future generations (to capitalize) or the maintenance of protected areas that often materially dispossess rural peoples to bolster lucrative tourism capital.

politics and resistance. Indeed, any review of scholarship on radical social movements and environmental activism could highlight the diverse, critical roles played by NGOs in sometimes organizing and fostering counter-hegemonic struggle, change and even liberation (Peet and Watts 1996; Townsend, Porter and Mawdsley 2004; Hawken 2006; Appadurai 2005; Wolford 2010; Wanner 2015). PCF itself collaborated with a range of other civil society actors, some of which even harbor anti-capitalist sentiments. The realization of any such radical potential, of course, requires significant effort as well as historically and geographically contingent conditions of possibility (e.g. material environments, politics, social structures, communities, leaders and more). Even then such work remains full of practical and ethical questions and potential contradictions to navigate (cf. Nagar 2002; Nagar and Raju 2003).

Finally, I came to this work aware (and was regularly reminded by respondents) that many colonial and postcolonial geographies have been repeatedly subjected to "field research" that amounts to data extraction, often with little informed consent to either the immediate practice of gathering information or to the larger political, economic or other uses to which such data are put. Tilley's standout scholarship (2011) on the African Research Survey in British colonial Africa as well as much of Drayton's work (2000 among others) on "nature's government" under the British offer examples of how science and scientific knowledge were instrumentalized and wielded for the purposes of development and "improvement" (i.e. exploitation) of colonial resources and subjugated people. In South India generally, and Malabar, Kanara and Konkan coasts in particular, different generations of colonial officials from Francis Buchanan to Francis Day to Edgar Thurston to James Hornell "toured" and "surveyed" territory, economies, landscapes and peoples that would justify, enable and guide their further command and control.[18] Of course, this pan-imperial knowledge assembly also relied upon, professionalized and further developed scholarly disciplines, including natural sciences and resource management as well as anthropology, (liberal) political economy, geography, history and others, suffusing "science" with colonial ideologies and aims. Recent sociological analysis of colonial administration and development of fisheries law makes this point beautifully: "early fisheries science in India [functioned] as a field of postcolonial politics by other means" (Sridhar 2024:1). The reams of printed material produced by colonial administrators, intellectuals, writers and travelers across the globe would eventually demand systems of recordkeeping, data ordering and information bricolage (c.f. Tough and Lihoma 2012). Many of those records still today fill innumerable shelves in what are now treasured collections in archives, institutions and repositories preserved disproportionately "at home" in the U.K. and secondarily across the (supposed) postcolonies. The approximately nine miles of shelving occupied by the India Office Records, held at the British Library in London, are testament to this recordkeeping which underpinned what we might think of as Britain's "empire of paper."[19]

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[18] As noted earlier, Buchanan (1801) specifically camped in the Aghanashini region and noted the estuary's "fine oysters."

[19] My own doctoral sojourn also included days, weeks and months glued to the always rather hard chairs of more than a dozen libraries, centers and archives across London, Cambridge and Oxford. Emphasizing the far-reaching tendrils of the colonial knowledge project, I have also collected colonial and early postcolonial records in Berkeley, Amsterdam, Rome and various corners of India.

This colonial surveillance, description, classification and reporting endured into the postcolonial period, as mostly urban scholars and scientists — many of them elites in newly demarcated independent nations — proceeded to conduct new rounds of resource assessments and industry surveys and reports of expert commissions. Consider one example: In the two decades after independence, India's National Council of Applied Economic Research published socioeconomic, technological and industrial surveys in the 1950s and 1960s that in many ways reproduced the colonial imaginary of India as deficient in capital, industry, infrastructure, and entrepreneurial spirit. Such assessments would also provide justification for teams of development experts to fan out across the Global South bringing "modern" science, technology and industry in the name of development (Sachs 2010); in India this took multiple forms — from the evangelism of Green Revolution crops (Patel 2013) to attempts at industrial inception in Keralan fisheries (Kurien 1985). Much time has elapsed between the postcolonial era of Big D Development (Hart 2001; 2010), and yet our own respondents reminded us now and then as we worked that rural people across India — and in particular in the Aghanashini area — have encountered scholars, social workers, government technicians, ag extension agents, NGO staff and others who carried out research or promised a new technology or "came asking questions not that long ago," often to never be seen again. More than a few times we heard some variation of "Why don't you just use that other person's notes?" or "I've already told someone everything I know. What benefit is there to telling you?" These questions, only partially rhetorical, contain critique and serve as a reminder of the durable neocolonial pattern of researchers (often from urban centers) descending on the countryside to collect information from communities sometimes for "development" and sometimes for indeterminate or hidden ends (see also Tuck and Yang 2014).

These political and intellectual commitments then conditioned PCF's research methodologies in multiple ways.[20] First, we privileged methods that would return practical information and provide assessment quickly yet respectfully (cf. Bauer and Johnston 2013) with the aim of avoiding the colonial habit of knowledge and "data" extraction for unwanted "development." Second, we chose methods that would consciously decenter my own positionality (and attendant limitations) [21] in favor of team social science carried out

[20] Simply claiming or espousing these critical, ethical or practical standards is neither sufficient nor any great guarantee of "success." Indeed, these reflexive critiques imply that sustainable development and conservation work — especially that of NGOs — *always* risks being complicit in projects of blatant unsustainability, inequality and injustice. As Liboiron (2021: 36) observes about critical science: It's all compromised at some level. "There are colonial ways to be in the world, whether intentionally or otherwise, and there are less colonial and anticolonial ways to be in the world." PCF strove to do the latter with our "research," even if we surely fell short.

[21] Consider the following composite description of me: U.S.-born/raised, "half-Desi," diaspora mixed settler, Kannada-ignorant, city-dwelling, bicycle-riding, ocean-swimming, graduate-educated, unobservant converted Hindu "scholar" and armchair activist with Marxist tendencies, who spends his days asking questions about environmental injustice and talking up radical sustainability on behalf of a new NGO founded by a semi-retired capitalist. Each of these concrete "positionalities" was reflected in a piece of biography I shared, an explicit comment relayed in real-time to me by a research team member, or gossip I would hear later from other PCF employees. I take no offense at such characterizations and can easily understand how the gaze reflects curiosity, bemusement and perhaps caution rather than animosity or fear. By dint of my citizenship, upbringing, education, habitus, locus of enunciation and other positionalities, ideologies or habits, I

by paid research assistants, translators and student interns able to collectively speak Kannada, Konkani, Hindi, Urdu, Tulu and English. As much as possible, we hired locally and collaborated with other regional civil society organizations. Third, we intentionally sought to make our data geographically *representative* and locally *inclusive*. PCF insistently pursued more-than-anecdotal evidence of the diversity and multiplicity of practices, ambitions, opinions and concerns for/about "sustainable development." Our scoping research quickly found local ideas about and ambitions for "development" that ran contrary to dominant but largely external narratives of peasant poverty, backwardness and underdevelopment. This ultimately led us to our multiple methods, including a large-*n* household survey with spatially referenced findings, as a basis for geographically representative, democratic-minded advocacy and programming.

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fundamentally stood apart from estuary residents who have myriad, *justifiable* reasons to be skeptical of me. Yes, I did regularly ride a mountain bike about the estuary for fun (**see Chapter 6**). And yes, I did once swim — in a fit of confidence and idiocy — a mile-and-a-quarter stretch of ocean around a rocky cliff to reach a secluded beach. News of that went far after a local coast guard launch motored by to check on me. I have no wish here to be preening or performative, but this long footnote signals my agreement with Liboiron (2021, Introduction, footnote 10) that "introducing yourself is part of ethics and obligation" to the communities where we work as well as the audiences who read our scholarship. Nor do I imagine my experience to be unique. Navigating these considerations should be commonplace and explicit across social science, and political ecology broadly calls for more open, self-reflection regarding our scholarly politics, entanglements and methods (cf. Sundberg 2017; Loftus 2015). We rarely spoke openly of these things in graduate school; I gesture to them here in the name of transparency; at a minimum, my comrades can consider not following in my missteps.

Chapter 3 | 'We have enough for our need': A political ecology of the Aghanashini estuary and the development project

Contemporary imaginaries of the estuary

The Aghanashini River estuary's mangrove-fringed backwaters, its rarity as an undammed river in India, its peasant ecology and economy and the region's relative lack of industrialization have for decades drawn the attention of a small but devoted following of scholars and conservationists (Bhatta and Bhat 1998; Chandran et al. 2012b; Daniels, Chandran and Gadgil 1993; Menon and Kohli 2015), many of whom explicitly or implicitly want to preserve the region precisely because it remains "a rare, pristine estuary" (Jojan 2017). I first encountered this literature in 2014 when I went to work as a Nehru-Fulbright fellow for the Indian central government's National Centre for Sustainable Coastal Management, assisting a multi-site, household survey project intended to inform coastal zone management.[1] Given its reputation, the Aghanashini served as a kind of heuristic figure and survey piloting ground for our research, demonstrating the range and possibilities of human dependences on and relations with estuarine ecology. In short, I had heard tell of the "pristine" Aghanashini River estuary, before ever setting foot on its banks, and the opportunity to work for its protection — whatever that ultimately meant — enticed me to join PCF in January 2015.

Arriving in the estuary, I found the biodiverse, "lightly touched" agrarian reality that I have thus far described. The proposal to build a shipping port in the estuary, of course, animated regional environmental politics, as did, to a lesser extent, mangrove afforestation efforts. With mangrove cover increasing alongside the maintenance of dynamic estuarine economy, the estuary reads — from some perspectives — as an anomaly along India's coastline, where pollution and degradation have become common. This seeming conservation success story has also inspired multiple proposals for institutional protection — under Indian law as a Biological Heritage Site, an Ecologically Sensitive Area or a Critically Vulnerable Coastal Area (Chandran et al. 2012a; Gadgil et al. 2004; Hegde 2014); or as an international protected area. In early 2024, advocates cheered as India declared the estuary one of international importance under the Ramsar Convention on Wetlands, a conservation designation long-sought by the estuary's defenders (Prasad et al. 2002).[2]

Apart from research that sought inputs from the actually existing peasantry, my work at PCF also put me in conversation with an array of area scholars, activists, officials and entrepreneurs (i.e. elites), who routinely shared their dreaming and scheming about the future of development in the estuary. The topics of these conservations ranged from neglect of the region by far-removed governments (since the pre-colonial period), to the (un)likelihood of the proposed shipping port living up to its promises, to the creeping

[1] https://ncscm.res.in/esa-cvca/

[2] Whether, when and how the Ramsar tag will have any practical bearing on the Aghanashini estuary remains to be seen. Implementation of Ramsar guidelines for management and protection of wetlands has been an ambiguous and uncertain affair in India (Bassi 2014; Farheen et al. 2022), though an educated guess suggests that small-scale estuarine fishers will ultimately *lose* more from state-led, institutional "conservation."

return of industrial aquaculture after a boom-bust cycle in the '80s and '90s. **Table 3.1** presents a sampling of claims about the modes and means of development needed in the estuary Aghanashini Estuary. Taken together, they represent the estuary in mosaic, if somewhat fragmented or contradictory.

Table 3.1 — The estuary's development discourse and politics

Development of ports and harbour [sic] contribute substantially to the successful economic development of the country by way of reducing dependence on air transportation and providing many others associated economic benefits. [...] This will set an example of development in harmony with the nature for the socio-economic development not only for the region but also for the whole Karnataka State and the Country.	Draft EIA for industrial shipping port proposed for the Aghanashini Estuary, August 2014
We're not doing this for the local people. We're doing it for the foreigners who are going to come and pay us trillions of fucking rupees.	Mumbai gem dealer/investor visiting the estuary to scout investment opportunities, January 2015
This is our river. Of course we will fight for it.	Elderly river fisher, March 2015
We see this estuary as one large ecology, one commons. We like to say that the river has rights to the land."	Retired ecologist and local environmental activist, March 2015
So many of these (mangroves) were planted by the Forest Department. That's not the work of nature, and now they're taking over, breaking bunds, letting in saltwater and spoiling our farmland… No, we don't threaten mangroves. Mangroves threaten us.	Nushikote rice/peanut farmer, March 2015
No one need worry. We'll never allow anything like (the proposed shipping port). Of course we will still say that we are for development and we are. We want development. This area has not had development and we deserve it. The boys from our community do not find good employment or jobs… But we will place so many conditions on this project such that they cannot construct it. We will only allow development that protects our river and our nature and benefits our people.	Upper caste manager of a producer co-op, May 2015
It would be a great service if your research can tell my department how we can convince the people to not cut the mangroves. It is the community's resource but some of the fishermen or the farmers, they resist, they don't listen to us, they go behind our backs and cut the trees we plant.	Forest Department region ("circle") head, May 2015
These people, they can't do anything like this. They need to be taught. If you don't teach them, they'll spend their money on alcohol. I can come here and bring some economic development,	Bangalore aquaculture developer leasing

and of course everyone can get rich. I can only make so much, so after I've made my billion, others can also.	traditional *gajni* lands in the estuary, September 2015
We deserve development, certainly, but not just any kind, not the kind that risks our current way of life. And we deserve to have a say. We should be even able to say no.	Oyster harvester, September 2015
The local people are looking for development. It has to be done according to their community agreement, but they need to improve upon their low livelihoods. And they need our help. How can they do it themselves?	District-level government fisheries scientist at Karwar, September 2015
It would be great if you could do something to help the investors… Without helping investors, there is no helping these people, is there?	Israeli investor touring the estuary with a property broker, October 2015
These people should want to protect their environment, to keep it pristine and build their natural economy. But they have no entrepreneurial spirit. They don't want to work.	Bangalore ecotourism/hotel developer, January 2016

The above quotations give voice to contradictory epistemological and ideological perspectives about "development" in the estuary, as well as their varying positionalities and loci of enunciation (cf. Mignolo 2009). External and elite viewpoints frequently offer paternalism (and even explicit condescension) hitched to caste/class privilege and assumptions that the spread of capitalism — the proposed port, tourist resort construction or industrial aquaculture — is inevitable, welcome and widely beneficial. Estuarine social ecology, meanwhile, appears as a resource to be commodified (if also managed and conserved/protected for its "pristine" qualities and future income-earning potential). Many such voices also implicitly repeat framings of the region as under-developed (and potentially regressive), echoing longstanding development policy/discourse in India and elsewhere about the supposed backwardness of fishers and the entrenched poverty of their rural coastal communities (Bene 2003; Jadhav 2018). This is hardly a position, however, limited to bourgeois, middle class or capitalist ideologies. Many a critical Marxist scholar and activist has aggressively derided the peasantry as non-modern and stubbornly attached to their habits and environs (see, most famously, the epigraph of this paper, Marx 1926[1852]), and assumed that they must meld (or die off) — through dispossession, pauperization and proletarianization — into a labor surplus for urban growth engines (Li 2010). Note, too, that blaming peasants and other rural people for their own poverty and for supposedly not protecting their own environment (often incorrectly but sometimes knowingly so) likewise has historical precedent in colonial and postcolonial settings (Agrawal and Sivaramakrishnan 2000; Davis 2007; Fairhead and Leach 1995; Jarosz 1996; Zimmerer 2016). Many of PCF's local interlocutors and collaborators unsurprisingly greet such discourses — and the projects, schemes, gazes and visions of rural development they have inspired[3] — with skepticism, emphasizing instead the risks industrial and commercial

[3] For the grand scale of such "development" in both colonial and postcolonial India, see Scott (1998) or Bhattacharya (2019). Or sit down with a cup of coffee to read Roy (1999).

transformations pose to local ecology and economy. Some people even explicitly politicize the terms of development, hailing a "we" who will fight to protect "our" rights, livelihoods or environment, even if the countryside is hardly uniform and quite variegated by caste, class, religious community and other social hierarchies.

However, I neither intend to romanticize them as pre-capitalist nor suggest an all-too-neat dichotomy of "virtuous peasants and vicious states" (the latter typically in league with capital). Many households are indeed petty-commodity producers, self-exploiting their own members and occasionally hiring extra, (often) marginalized labor.[4] Even those households that spend a majority of their labor time in production for non-market ends still find their lives infiltrated by concerns of the capitalist economy: Is today's catch/price good enough that we should sell instead of eat it? Will we need to buy extra rice or cattle fodder to get through this winter? Where will money come for the children's tuition? How will we pay the loan we took to cover last year's medical bills (or farming inputs)? Intra-household dynamics and gendered divisions also condition which household members are more likely engaged in market production or wage earning, and which (typically women) are responsible for subsistence provisioning as well as household management and care.

Beyond household encounters with capitalism, what I identify as a peasant ecologies economies across India's coastline must also confront the country's neoliberal (and increasingly Hindu nationalist) Blue Economy agenda, which frames numerous sacrifices of oceanic life and livelihood as necessary for national development (**Chapter 4**). Some peasant households eagerly participate/cooperate with factions of capital and the multi-faceted state in such transformations. Consider that eco-tourism is promoted not only by hotel developers, travel companies, investors and state agencies external to the region, but also by local residents with ambitions to list even a single a room on Airbnb, run a beachfront snack kitchen or charter their fishing boat to a tour group. Meanwhile, peasant households with *gajni* tenures in practice become small-time landlords and shareholders when they lease their lands to outside developers who aggregate and excavate the small plots to build, for example, industrial-scale shrimp or cobia farms. Such "developments" might indeed represent the creep of capitalism in the countryside, with new and old class differentiations and oppressions; in such an analysis, many estuary households might constitute a kind of contemporary "middle" peasantry — neither the clear primary exploiters, nor the most abjectly exploited, but persistently straddling market and non-market realms.[5]

The actually-existing agrarian economy/ecology of the Aghanashini Estuary

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[4] More often, however, our research found households borrowing or trading labor (or draft animals) along with other shared or redistributed produce, often through community or kinship networks. For example, one respondent explained, "We give our dried peanut plant to our relatives for their cattle feed as we use their cattle to plough the fields."

[5] This framing draws on classical agrarian studies literature (i.e. Kautsky 1989, Lenin 1899) as well as the many contemporary analyses and debates focused on Indian agrarian political economy (among many possibilities, Amin 1984, Patnaik 1987; Byres 1991; Gupta 1998; Lerche 2013; Lerche and Sah 2018; Lerche 2021).

Amidst/against the discursive framings of the previous section, PCF conducted research on agrarian political economy/ecology as well as understandings of and aspirations for "development." What forms of market and subsistence production did households engage in? What kinds or modes of development did they want/need and why? Committed to the proposition that rural people, peasants and agrarian producers actively participate in political economy and behave in political economic ways[6] — irrespective of narratives outlined above — we sought answers broadly and directly via a large-*n* household survey, further informed by hundreds of interviews on a range of topics.[7]

Tables 3.2 through **3.13** provide data summaries for the full sample as well as sub-samples split partially and imperfectly along class lines. Taken as a whole, these data provide a multi-faceted picture of estuary-wide agrarian (re)production and livelihood and a window into sociopolitical ideas about and ambitions for "development." Reading across the tables, five thematic findings — and implicit arguments — arise.

1. Diverse agrarian livelihoods

We found a broad, heterogeneous array of livelihoods and income sources across households, including only partial production for the market economy. Our survey catalogued 22 distinguishable income sources (**Table 3.2**) contributing at least a quarter of households' *money* earnings (in addition to offering a catch-all "other" category), reflecting in a broad sense the diversification and differentiation (along with specification and articulation to capitalist modes of production) observed across contemporary peasant social ecologies and economies (Akram-Lodhi and Kay 2009; Bryceson, Kay and Mooij 2000; Levien, Watts and Hairong 2018; Moyo, Jha and Yeros 2015). Survey categories, of course, are never perfect and by default hide even more diversity; for example, the range of activities that might support "selling fish we catch from the river/*gajni* land" includes at least a dozen different kinds of fishing differentiated by gear type, location in the estuary and social community of the fisher, while the fish caught might be one of dozens of species. We settled on basic categories that made sense to our respondents in pre-survey scoping interviews; from those, we find unsurprisingly that the agrarian economy predominates.

[6] I.e., they are not Marx's potatoes. Peasants think, they strategize, they operate and make choices — if frequently from positions of marginality — amid (often transforming) social ecologies and economies, though they may not do so according to liberal economic reasoning (pace Popkin 1979). This has been a long-standing observation of critical agrarian studies (cf. Scott 1976; Wolf 1966;) that continues to be observed today (cf. Li 2014; Matthan 2021, 2022; Sethi 2021;).

[7] The survey also included an array of questions focused specifically on the estuary's mangrove habitats, their values, threats to them and ideas for their management (Jadhav 2017). These chapters focus primarily on quasi-agrarian class and development analysis; for that, I regret not asking more questions about household means/modes/scales of production as well as standards of living (to track, for example, uneven standards of living or access to means of production). Survey methods and logics are described in more detail in **Chapter 2**.

Table 3.2 — Major sources of household annual monetary income (at least one fourth)

n=1,001	*%*
Agrarian production	
selling produce from own farm field or plantation	23.5
selling fish we catch from the river/*gajni* land	14.1
selling fish we catch in the ocean in large boats	9.5
selling fish we catch in the ocean in small boats	8.2
selling bivalves (oyster/clam/etc.) collected for meat	4.4
selling forest products we collect including firewood, timber, bamboo, herbs, medicinal plants, etc.	0.7
Labor	
working as paid farm labor for another owner	17.3
wages as a laborer / business employee (not owning or managing)	7.8
working as paid fishing labor for another boat owner	4.4
working in sand mining	0.6
work that includes digging/mining/selling dead empty shells from the river	0.2
Commerce and (petty) capitalism	
renting our farm/land to someone else	6.6
owning/running a small business/shop (trader, restaurant, tailor, etc.)	5.7
owning/running a large business with many employees	1.1
owning boats used by others	0.6
selling/marketing farm, forest or fish products not harvested by our household	0.5
Professional work	
wages from a government job (including teaching in a government school)	5.9
wages from an office job or other professional job	3.6
Miscellaneous	
money sent from family members living outside the household	4.4
pension/government benefits	4.0
many small sources; no single source contributes a quarter of our income	3.1
returns from investments in property/stocks/bonds/securities	0.1
other	16.9

The wide array of livelihoods can be roughly mapped in political economic terms, creating broad economic classes based on major income categories (**Table 3.3**). Nearly 50 percent of households earn at least a quarter of their income from agrarian production — i.e. selling some portion of their family's fish, farm and forest products. One common cropping pattern: peanuts in the winter (selling most but not all for money while storing stalks for fodder), and rice during the monsoon (supplying the *entire* household annual rice budget). Those with adequate holdings typically also cultivate multi-story gardens yielding a range of agroforestry produce such as banana, areca, coconut, jackfruit, betel leaf and/or pepper, among others. Households with the largest holdings may be most easily described as capitalist farmers, with land "improved" and dedicated to small coconut, banana, areca or spice plantations or local specialty crops for regional sale: "Gokarna cucumber" and "Kumta onion." Collectively, households intentionally grow dozens of other fruits, vegetables and other plants. Fishers of nearly all scales sell some or much of daily catches, but the diversity of production, processing and exchange (and rarely ever is an entire harvest sold) complicates any suggestions of mature "agrarian transition." A large majority of households report that they *prioritize* subsistence, only selling their produce *if* they need to dispose of surplus or have extraordinary money needs and only when transport and labor requirements align with the chance to make a good sale. Key commodities (e.g. peanuts and

cashews) or particularly standout harvests (e.g. high-value crabs, prawns or fish) might be bought by roving wholesalers, while others sell through state-supervised wholesale *mandis* (e.g. areca or nutmeg). The pettiest of commodity producers may sell harvests locally in village shops, town bazaars in Kumta or Gokarna, or the many roadside stands in between.

Table 3.3 — Household participation (%) across income categories

	Full sample	*Agrarian production*	*Labor*	*Commerce, (petty) capitalism*	*Professional work*	*Misc.*
n	*1001*	*481*	*288*	*138*	*91*	*271*
Households earning from agrarian production	48.1	-	34.7	39.9	11.0	16.6
Households earning from labor	28.8	20.8	-	17.4	4.4	6.3
Households earning from commerce and (petty) capitalism	13.8	11.4	8.3	-	8.8	8.5
Households earning from professional work	9.1	2.1	1.4	5.8	-	4.1
Households earning from miscellaneous activities.	27.1	9.4	5.9	16.7	12.1	-

Almost 30 percent of households (including some of those producer families) earn money via wage labor: often physically demanding work in fields, on docks or at construction sites, but also working in small businesses as "shop boy." Reflecting the gendered division of rural labor, women in particular find work in small-scale processing factories (e.g. of coconut and cashew), though in poorer or more socially conservative households women also labor in fields as much (or more) than men. Less than 15 percent of households earn at least a quarter of their income through commerce and petty capitalism (primarily renting land to others or running small shops selling dry goods, local produce and sundries). Fewer than one in 10 households earns substantially from professional work; those that do are also least likely to earn from other income categories.

2. More-than-market economy

Households broadly report *low* money incomes (**Table 3.4**); 70 percent of respondents estimated annual money income to be 25,000 rupees / $375[8] or less; and more than 85 percent of households fell under a threshold of 100,000 rupees / $1,500).[9] More households engaging in commerce and (mostly petty) capitalism claimed higher incomes,

[8] Unless otherwise noted, currency conversions through this paper use a rate of 66.66 rupees to $1, the approximate exchange rate in May 2016, when PCF launched its survey.

[9] Agrarian household incomes are notoriously difficult to establish, especially given the diversity and variability of sources observed in large, inter-generational households (cf. Fisher, Reimer and Carr 2010). Detailed accounting can be an exhaustive endeavor for even a small sample of households, so we asked households to pick only an estimated range.

but nearly 60 percent still only earn up to 25,000 rupees / $375. Households drawing "professional" wages were unsurprisingly the best off "class," with more than 50 percent of households earning about 1 lakh rupees. For officials, planners, entrepreneurs and economic elites more broadly such estimates of income serve to confirm claims about middling economic development in the region; according to Karnataka's Planning, Programme Monitoring and Statistics Department (GoK 2022), Kumta *taluk*'s HDI in 2019 ranked 85 out of 176. A lack of money income and dependence on agrarian household (re)production — i.e. peasant lifestyles — are rendered in this government report — produced in the state capital, Bangalore — as underdevelopment.

Table 3.4 — Households (%) by annual money income in rupees

	Full sample	*Agrarian production*	*Labor*	*Commerce, (petty) capitalism*	*Professional work*	*Misc.*
n	*881*	*447*	*260*	*119*	*76*	*220*
Up to 25,000 rupees	70.3	72.5	85.4	59.7	36.8	56.4
More than 25,000 and up to 50,000 rupees	6.2	6.9	3.8	5.0	3.9	8.2
More than 50,000 and up to 75,000 rupees	4.2	5.1	2.7	5.0	1.3	6.4
More than 75,000 and up to 1 lakh rupees	5.6	5.8	3.8	5.0	6.6	9.1
More than 1 and up to 1.5 lakh rupees	4.8	3.8	3.1	8.5	10.5	7.3
More than 1.5 and up to 2 lakh rupees	2.7	2.0	1.2	5.0	3.9	4.1
More than 2 and up to 3 lakh rupees	2.4	1.8	0.0	5.9	10.5	2.7
More than 3 and up to 4 lakh rupees	2.7	1.8	0.0	2.5	17.1	3.6
More than 4 and up to 5 lakh rupees	1.0	0.2	0.0	3.4	7.9	2.3
More than 5 and up to 7.5 rupees	0.0	0.0	0.0	0.0	0.0	0.0
More than 7.5 lakh and up to 10 lakh rupees	0.0	0.0	0.0	0.0	0.0	0.0
More than 10 lakh and up to 15 lakh rupees	0.0	0.0	0.0	0.0	0.0	0.0
More than 15 lakh rupees	0.1	0.0	0.0	0.0	1.3	0.0
Don't know/ Declined to answer (n)	122	34	28	19	15	51

Yet PCF's data also point to a recurring problem of poverty measurement: How useful are

money income or GDP as measures of "standard of living?" An answer starts with noting a philosophical and practical truism: There are many things in life that money cannot buy, and this is all the more so in the rural world. Leaving aside more esoteric concerns,[10] many commodities — including services — simply aren't available around the Aghanashini estuary, even if you wanted to spend the money. Consider the example of healthcare for estuary residents. Certainly small hospitals and radiology centers exist that readily accept cash or a bank card, though they might be more than an hour away by motorbike from some parts of the estuary. Small local clinics and visiting doctors also might prefer payment in cash or the ubiquitous digital payment system, but the latter today may also accept payment in kind from a money poor household, according to our research. In short, the money economy represents only a part of productive activity that occurs around the estuary. At some point, money measures leave out more than they cover.[11]

Our research finds that meager annual cash intake is offset by and often subordinate to a wide (and widespread) range of subsistence production strategies, many shot through with elements of social economy, cooperation and dependence on the commons. Consider that 90 percent of households, in a broadly cross-class fashion, report diverse forms of *subsistence* production (**Table 3.5**). Tree products are most common across income source classes; coconut, banana, mango, areca, jackfruit and cashew are staples found in gardens and on homesteads across the region. Challenging any notion of fixed economic identities of households, those with commercial/capitalist incomes also report the highest levels of non-market production of tree and farm products.

Coconuts provide, perhaps, the example most ubiquitous throughout the estuary of crop production as *agri-culture*. The trees themselves are strategically planted around buildings to produce shade; fronds become woven mats, fishing traps and brooms. The fruit itself offers sweet water and of course flesh, which is further prepared myriad ways — as tender meat, fresh shavings, pulp, dried flakes or oil, among other wants/needs; husks may be saved for fibers (including for ropes and nets) or may be burned with shells and other woody bits for fuel or added to composts. At the end of a tree's life (or if felled prematurely), trunks may be used in construction of boats and houses, or sold to paper mills as pulp stock. Coconuts provide so many material benefits that a sprouted coconut sapling is a common and welcome wedding gift. The fruits, leaves, grasses, branches, etc. of numerous other field and forest plants are likewise put to many uses, and many households report intentionally cultivating or harvesting multiple products as a hedge against risk and increased opportunity for surplus.

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[10] Such concerns — what is the "good life" and what is its "cost"? — remain fruitful for analysis and politics (cf. Roy 1999), especially when climate change already and increasingly disrupts economies of all scales. In terrible-but-entirely-possible altered futures, destructive events such as flooding, storms and fires all have the potential to fracture supply chains and transportation networks as well as brick (at least temporarily) the digital infrastructure, utilities and internet access that urban, money economies need. In a world where such a catastrophe strikes urban centers regularly, the viability and persistence of rural, peasant subsistence ecologies and economies will be only more relevant.

[11] All models are wrong (Box and Draper 1987), and indeed many are far *less* useful than they are given credit for.

Table 3.5 — Households (%) engaged in subsistence production (i.e. "that it does not sell but instead consumes at home")

	Full sample	*Agrarian production*	*Labor*	*Commerce, (petty) capitalism*	*Professional work*	*Misc.*
n	*989*	*477*	*283*	*137*	*91*	*268*
Tree/fruit products including coconut, cashew, mango, etc.	75.7	73.2	82.3	83.2	82.4	74.3
Farm products like rice, peanut or food crops	37.6	46.5	41.0	52.6	28.6	41.0
Fish/shrimp/crabs/ bivalves	24.5	44.2	19.4	21.2	2.2	7.8
Other forest products including firewood, timber, bamboo, herbs, medicinal plants, etc.	1.0	0.0	1.8	1.5	0.0	1.5
Other	1.4	0.4	1.8	2.2	0.0	2.6
Nothing harvested	10.9	5.9	10.2	8.0	14.3	14.6

Though PCF's survey did not specifically query animal rearing and use, households across the region also keep livestock (e.g. cattle, goats and poultry), mostly at small scales and rarely for commercial production. Much animal rearing has also "developed" and differentiated along social lines. Bulls/cows are almost exclusively kept by Hindu families[12] and are typically integrated into household-scale production systems: as beasts of burden and sources of milk and dung. Keeping more than a few cows is uncommon, and some households have none and instead borrow/hire when an animal is needed. Many cows roam freely across property boundaries grazing at will, further communalizing land and contributing to traditional architecture designed to manage cattle. Foremost is the *goshala*, a traditional shed-like building that offers monsoon protection to cows, collects manure and stores fodder. Home garden plots are also traditionally bounded by walls (mostly of red laterite stone blocks) built with very narrow gateways that impede cow entry.[13] Goats, meanwhile, are more likely to be found seasonally in better-off Muslim households, particularly in advance of the typical Eid al-Adha sacrifice and celebration.[14]

In interviews, households also report broad patterns of community sharing and reciprocal dependence — e.g. "We give our dried peanut plant to our relatives for their cattle feed as we use their cattle to plough the fields." While surplus harvests may yield extra cash

[12] Cows are culturally revered across much of India according to diverse Hindu beliefs (even held as truly sacred in some specific traditions). Their ownership, use and care in India are also bound-up in complex right-wing ethnonationalist politics, which makes them a kind of culturally and politically restricted "asset," and often a de facto source of inequalities. When synched with violent social groups and movements (e.g. Hindutva in the present moment), cow "protection" has turned into "vigilantism" (Chitageri 2008; Staples 2019).

[13] They also comically frustrate the large occasional American social scientist, who risks ripping buttons off his shirts every time he squeezes through sideways.

[14] In parts of South Asia, this holy day is colloquially known as *bakri* (goat) *eid*.

income for households that need it, windfalls may instead be redistributed (particularly in festivals and celebrations). Sharing also extends to household labor as families in neighborhoods, social communities and extended kin networks trade helping hands, sometimes for cash but often for a meal, a share of harvest or the presumption that the favor will be returned. Notably, sharing within a "community" — i.e. households with common traditions who benefit from mutual reciprocity or protections — may simultaneously represent and reinforce social exclusions and hierarchies, by precluding sharing across caste, class, community, religious or other social boundaries.

The sharing of produce and labor often accompanies coordination and group decision-making in agrarian activity (e.g. when to collectively drain rice fields, open sluice gates or harvest a meadow commons). Many respondents also report, approvingly, social consensus (or at least pressure) not to overharvest or unfairly claim parts of the commons such as forest patches or the hilltop meadow inside the ruins of Rajamundroog, that sea-facing outpost precolonial rulers. In interviews, we regularly heard comments like "We only take what we need," "People here only take their share," and "We are able to get enough." Meanwhile, diverse fishing in the estuary — while a *de jure* open access resource — remains governed by *de facto* social prescriptions and proscriptions that favor cooperation over competition: respect others' nets/gear, do not harvest immature bivalves, do not fish (especially in the deeper sea) during rough weather, etc. Fishers say such "rules" are rarely spoken but enforced through social pressures and relations (including sometimes with recourse to caste/class hierarchies) applied to neighbors, friends and community; "There's no communication explicitly among families, but everyone takes only what is required and there's never been any confrontation."

3. Demands coupled with skepticism and refusal

The idea of "development" — popularized as *vikaas* — and its demand as a universal good (even a public right) has become practically hegemonic in India's popular, political and policy common sense, as in many postcolonial geographies (cf. Li 2007; Sachs 2010). This, despite historical experience in India, especially among rural people, with the unevenness, failures, dispossessions and high costs of so-called development and economic growth (Baviskar 1995; Gadgil and Guha 2000; Levien 2018; Shrivastava and Kothari 2012; Sud 2021; Sundar 2016). Consistently, throughout our research, we found few people in Aghanashini willing to completely disavow the idea of development, *in the abstract*, though plenty of respondents would offer at least mild critique of specific projects old and new. Some respondents, for example, would qualify their own strong criticisms of the shipping port proposal with a claim that they still support development for the region.

When discussing ambitions, households generally prioritized public and social goods and projects — a hospital, school or paved road — over increased economic opportunities for wage labor in a factory or a tourist resort. Some respondents also shared worries about the social or ecological disruptions to local life such as increased inequality or conflicts over community norms (for example, when beach tourism brings a libertine party culture to conservative beachside villages). We also regularly heard skepticism about seeking employment or new lives in frenetic, anonymous cities — either regional hubs like Mangalore or mega-urban centers like Bangalore — though some households already send

members (usually young and middle-aged men) to commercial fishing harbors for work as seasonal labor during peak harvests (e.g. that of the oil sardine).

To further probe these multivalent ideas and ambitions, our survey presented respondents a simplified agree-disagree scale. The results (**Table 3.6**) demonstrate that "development" has many meanings and forms, not all of them equally welcome among estuary households. Widely, households agree that the area "needs" public infrastructure such as roads, schools and hospitals (81.4 %) more than they endorse industries, large business and new jobs (57.3%). Roughly 70 percent disagreed that environments and ecologies must necessarily be sacrificed for development — a common political/policy proposition that sits at the heart of the shipping port proposal and much of India's Blue Economy agenda (**Chapter 4**). The survey also detected measurable skepticism at the promises of mainstream economic development. More than a third of respondents say that businesses would bring with them new "trouble" (e.g. inequality, inflation or environmental degradation), fully half of the sample also openly stated they distrust government projects to create benefits locally. Consider the critique of a middle-aged Muslim river fisher:

> "We are not against all kinds of development. That which benefits us and our people, our village, we will surely support. But if they build that large shipping port, who will benefit? I will not, my family will not. Common people like us will not. ... How could we? Can we start a trucking company (capitalizing on port business)? Of course not. Where we get money? Will my son become a manager at the port? No. Those jobs will go to people with degrees — engineers and the like — brought in by the company. ... Maybe he will become a *coolie,* because we will lose our access to fishing when the estuary is ruined. Only that is certain."

Table 3.6 — Household agreement (%) with development ideas and ambitions

		Full sample	*Agrarian production*	*Labor*	*Commerce, (petty) capitalism*	*Professional work*	*Misc.*
Area needs industries, big businesses, jobs	Agree	57.3	51.6	58.4	60.3	68.9	65.0
	Maybe	6.2	7.2	5.3	6.6	5.6	6.8
	Disagree	36.5	41.3	36.3	33.1	25.6	28.2
	n	983	475	281	136	90	266
We are comfortable in our current lifestyle	Agree	83.4	84.9	82.8	91.3	84.6	79.2
	Maybe	9.9	10.4	8.8	5.1	14.3	11.2
	Disagree	6.7	4.6	8.4	3.6	1.1	9.7
	n	993	477	285	126	90	269
Area needs roads, schools, hospitals and other public infrastructure	Agree	81.4	80.0	82.3	73.7	82.4	82.4
	Maybe	5.9	7.4	4.2	11.7	5.5	7.1
	Disagree	12.7	12.6	13.4	14.6	12.1	10.5
	n	990	476	283	137	91	267
Big businesses will bring trouble to the	Agree	36.5	44.1	36.2	41.8	32.9	29.4
	Maybe	13.4	14.5	12.0	15.7	10.6	14.5
	Disagree	50.1	41.3	51.8	42.5	56.5	56.1
	n	958	467	276	134	85	255

area							
We are interested in migrating from this area	Agree	9.5	8.6	12.3	11.6	10.0	7.4
	Maybe	5.3	5.5	5.6	5.1	6.7	6.7
	Disagree	85.2	86.0	82.1	83.3	83.3	85.9
	n	992	477	285	138	90	269
We don't trust gov't projects to really bring benefits for our villages	Agree	51.6	52.4	53.6	51.1	49.4	53.0
	Maybe	12.1	12.1	9.9	12.4	13.5	14.0
	Disagree	36.3	35.6	36.5	36.5	37.1	33.0
	n	966	464	274	137	89	264
Natural resources must be sacrificed for development	Agree	20.8	23.1	26.0	20.7	27.9	11.5
	Maybe	10.1	9.4	9.2	16.3	15.1	11.9
	Disagree	69.2	67.5	64.8	63.0	57.0	76.6
	n	963	467	273	135	91	261
We hope our children can remain in our kind of work	Agree	18.7	21.5	19.6	18.8	22.5	11.2
	Maybe	2.2	1.9	1.4	1.4	3.4	2.2
	Disagree	79.1	76.6	79.0	79.7	74.2	86.8
	n	986	474	281	138	89	269

As explained in **Chapter 2**, the proposal for the stalled industrial shipping port loomed large during our research as a singular exemplar of "development" and potential engine of transformation of estuarine life and livelihood. While port promoters downplay social, economic and environmental impacts, they acknowledge that monetary compensation and/or relocation and retraining assistance may be a necessary minimum for households facing displacement or loss of resources, income or subsistence (NEERI 2015). To test household willingness to accept (WTA) compensation, PCF's survey incorporated a quasi-contingent valuation prompt. After listening to the scenario specification,[15] respondents received one of seven hypothetical cash compensation "bids" at random; if an initial bid was rejected, the respondent was offered a second bid, 25 percent higher. While the lowest bid (40,000 rupees / about $600) would severely undercompensate almost any household,

[15] The contingent valuation prompt read: "The Karnataka state government wants to build a large industrial shipping port at Hiregutti / Nushikote on land it acquired many years ago. The government wants the port to ship in coal and bring out iron. If successful after some years, the project might generate revenue for the government and a private partner corporation. If the port comes, other factories or a power plant may follow, though these might not locate in Kumta taluk but instead could be located far away. There will probably be an increase in truck, transport and travel business locally. People with higher education may also get jobs as engineers or managers at the port. The port may also offer some jobs for daily laborers and would also probably attract migrant workers from other regions. A hospital or school could also be built near the port. To construct the project, the government will clear out many mangroves and old *gajni* land in the areas near Hiregutti, Nushikote and Morba. The construction of the port and the traffic of large coal and iron ships will reduce the water quality of the backwaters. As a result, fishing, *gajni* use and salt making around the backwaters will suffer or even stop. Many other mangroves and other wetland plants may also die off. The port will also make the backwaters very deep near Aghanashini for large international freight ships to enter. This will destroy the oyster and clam beds. The fishing jetty at Tadri and other docks upriver for large fishing boats will also probably be closed. Scientists are uncertain how far other problems such as air pollution or salt water in wells will be spread. Certainly the backwaters as they are today will be changed. Please think about how this project could affect your household. Project promoters and government laws suggest compensation may be given to people whose land, lifestyle or livelihood are negatively affected. To offset any negatives you could face, would your household be satisfied with a one-time compensation, paid by the government directly to a bank account of (randomized compensation "bid")."

especially those who lost property, it was chosen to roughly correspond to annual cash incomes of many households. The highest bid (40 lakh rupees / about $60,000) might align with what a small-holding household would get in a land sale.[16] The overwhelming result: *widespread* refusal to accept cash compensation for dispossession and disruption of estuarine life and livelihood (**Table 3.7**). Bids up to 4 lakh rupees were rejected by roughly 95 percent of respondents. Even the maximum offer was rejected by three in four respondents.

Table 3.7 — Household responses to randomized compensation "bids" in contingent valuation exercise

Initial compensation bid	*n*	*Bid rejection (%)*	*Revised bid (rupees)*	*n*	*Bid rejection (%)*
40,000 rupees	140	97.9	50,000 rupees	137	99.3
80,000 rupees	135	94.1	1 lakh rupees	125	97.6
2 lakh rupees	166	95.2	2.5 lakh rupees	157	99.4
4 lakh rupees	133	94.7	5 lakh rupees	125	100.0
8 lakh rupees	140	88.6	10 lakh rupees	123	96.7
20 lakh rupees	131	87.0	25 lakh rupees	113	95.6
40 lakh rupees	112	75.0	50 lakh rupees	81	92.6

This rejection of hypothetical compensation for dispossession — put another way, this refusal to accept the sacrifices the port would require — could of course be animated by any of myriad household concerns over economic inequalities, environmental degradation and social disruptions. Even the economic planner who dreams of exporting immense accumulations of commodities could find reason enough to doubt *this* project's viability from a commercial standpoint alone.[17] Remember, however, that a string of development projects have been attempted or proposed and then *resisted* and blocked in the estuary in recent decades (see also **Chapter 4**). Meanwhile, our research has identified reluctance to participate in mainstream development models (found across coastal India, increasingly hailed under the sign of the Blue Economy), both in survey responses and interviews.

4. (Relative) abundance politicized

When considering the estuary's history of opposition to destructive industrial "development" (most recently the shipping port project), it is tempting to read a *politics* of *anti-development*. Such a finding would be a notable inversion, given how often

[16] While working for PCF, I heard asking prices ranging from 10 lakh to 1 crore rupees for a hectare of farmland, slightly smaller than 1.2 hectare-average landholding for an agricultural family in Karnataka in 2017 (NABARD 2018: 18). Yet agricultural land prices vary wildly by geography (soil, topography, water, microclimate, ecology/biology/zoology, physical access, social environment, local political economy and the like). Land for development is also "hot" in India (Sud 2021), so estimates of real estate prices of several years ago are woefully out of date.

[17] The multiplicity of critiques ultimately led to the strange, multi-scalar political bedsharing; the ranks of those opposing the port project included local citizens, local/regional/national conservation organizations (including PCF), state scientists and a rightwing "justice" organization affiliated with the Hindu nationalist Rashtriya Swayamsevak Sangh (RSS). This is not the space for such stories from the trenches, but I suspect my experience at PCF would resonate with other development practitioners who have confronted without resolving the messy contradictions inherent to coalitional politics.

d*evelopment* itself produces a kind of *anti-politics*, manufacturing the consent to expert or technocratic rule (cf. Ferguson 1992; Li 2007; Mitchell 2002). More than hopeful, however, such a claim would also be wishful, as PCF's research clearly documents households' explicit demand for "development" of some kind — restricted, sensitive, limited, "sustainable" or otherwise qualified to be sure, but demanded all the same.

Yet acknowledging that "development" remains a demand in the region is neither a concession to the elite refrains of "desperation" or "backwardness" nor a suggestion that residents would consent to or desire capitalist transformation. Instead, our research consistently found that local ambitions — for the "good life," for social ecology, and, yes, for "development" — largely seek to maintain, support or conserve the actually existing peasant *abundance* of the Aghanashini River estuary region.[18] As noted, estuary residents in interviews were willing to openly criticize the "development" on offer from state agencies and capitalist developers.[19] Apart from objections to the proposed shipping port, many respondents also expressed skepticism about the boosterish claims made about the aquaculture and mariculture expansion supposedly key to India's sustainable Blue Economy ambitions (**Chapter 4**). Estuary residents can easily recall the boom-bust transformation of wetlands that occurred during an earlier aquaculture wave in the 1980s and '90s. After a few rounds of profitable , which ultimately left behind abandoned, polluted ponds too deep for traditional, more sustainable cultivation methods (see also Bhatta and Bhat 1998). Large-scale aquaculture production in the estuary today is largely driven (again) by remote investor capital (e.g. an entrepreneur from Bangalore, an established company from Gujarat, investors with their own labor gang from southern Maharashtra). Households with traditional *gajni* wetland tenures can turn profits by leasing them to developers, but river fishers, farmers and saltpan owner/operators, whose livelihoods depend on river water quality, say they fear widespread environmental risk (e.g. accidental or intentional release of fishpond waste). As another emerging sector, beach/estuary tourism also provokes similar fears over the social and ecological transformations it may bring (e.g. sex/drug/party culture, pollution, inflation and dependency on wage employment).

As the matriarch of a multi-generational farming household explained:

> "We wouldn't want any major development in this area as factories or industries could cause lot of noise and dirty the place. Our lifestyle here should stay the same. We do not have strict work timings and are not under any sort of pressure to do things from others. Our life is peaceful and comfortable. I would like that to remain the same. […] We would like to stay here. We have been settled here for a couple of generations now and have become comfortable in our way of life. Where else would we go? We built this

[18] Remember that more than 80 percent of survey respondents agreed that "we are comfortable in our current lifestyle." Agrarian producers and laborers *also* agreed at similar rates, as did more than 90 percent of households with income from commerce/capitalism (Table X, above).

[19] Many households were also willing to openly criticize the Forest Department for its mangrove afforestation and conservation enforcement efforts.

> house from our sweat and blood and would like to see our future generation settle here. Even my second son who works in Bangalore for a car company wants to come back and settle here."[20]

A further sign of satisfaction: Less than 10 percent of respondents agreed that "we are interested in moving away from this area," and when asked to pick "the most important need of your household" from a list (**Table 3.6**), less than one percent of households considered moving even some family members to be their top priority.[21] Residency in the estuary is overwhelmingly long-term — more than 80 percent of households indicate that their family/ancestors have been living in the region for at least 100 years (**Table 3.9**). We also heard familiar, skeptical refrains about the frenetic, grasping pace of life in Indian cities such as Bangalore; though teaming with possibilities for socioeconomic mobility and innovation, megapolises in India and globally also frequently produce hyper-dense menageries of exploitation and urban precarity (Sassen 2001; Davis 2005). In interviews, we consistently heard resistance to the kinds and forms of development that would drastically ramp up local commercial activity or otherwise sacrifice socio-economy/ecology when, "we have enough for our need,"[22] as one river fisher put it. "The life we have here is good, it is a happy one, I am old now and I have lived here all my life. I have been happy. The environment is good, and there is clean air and peace here." Or a middle-aged woman from a farming household said, "Our lands should stay the same. They give us security. The calm and quiet of this place is nice, and is good for growing children to play and it is very safe here. We don't want that to change."

Table 3.8 — Households (%) by "the most important need of your household"

	Full sample	*Agrarian production*	*Labor*	*Commerce, (petty) capitalism*	*Professional work*	*Misc.*
n	*994*	*479*	*283*	*138*	*91*	*270*
Getting good education for children	42.1	39.9	51.2	39.1	49.5	33.3
Protecting our existing way of living	13.7	15.0	12.4	22.5	4.4	16.7
A steady job / income locally that is not fishing or farming	13.4	12.3	11.0	11.6	11.0	19.6
Bringing in business, goods, services and general	10.5	8.8	9.9	11.6	12.1	10.0

[20] Interviews such as these, conducted seaside at the pace of life in the estuary certainly might draw comparison to other peasant narratives both in India (Guha and Spivak 1988) and beyond (Berger 1992).
[21] Notably this holds in the estuary region despite the multi-decade trend of rural-to-urban-migration across India (cf. de Haan 1997; Mitra and Murayama 2009).
[22] One other piece of admittedly anecdotal evidence that is nonetheless instructive for me: Over the course of more than a decade, I have conducted hundreds of formal and informal interviews among marine/estuarine fishers, fishworkers and their allies in nearly 20 coastal districts in eight Indian states and territories. The Aghanashini estuary is the *only* site where I've ever heard fishers claim sufficiency: "We don't face shortages and we can always get what we need."

development						
Good prices for the farm or fish products we sell	9.4	15.4	8.1	5.1	4.4	4.4
Medical treatment of illness for a family member	4.2	4.6	3.5	5.1	7.7	4.1
Moving some or all members of the household away from the area	0.6	0.6	0.0	0.7	1.1	0.7
Other specific priority	5.2	2.7	3.2	3.6	7.7	10.4
Don't know	1.0	0.6	0.7	0.7	2.2	0.7

Table 3.9 — Households (%) by family residence time in the estuary

	Full sample	*Agrarian production*	*Labor*	*Commerce, (petty) capitalism*	*Professional work*	*Misc.*
n	*998*	*479*	*286*			
Fewer than five years	0.4	0.0	0.0	0.0	2.2	0.7
At least 5 years but less than 10	1.0	0.8	1.0	0.7	0.0	0.7
At least 10 years but less than 25 years	2.9	1.7	3.1	2.9	2.2	3.3
At least 25 years but less than 50 years	4.6	4.0	5.6	2.2	5.5	4.1
At least 50 years but less than 75 years	4.4	4.0	3.5	6.5	3.3	4.8
At least 75 years but less than 100 years	2.6	2.3	3.5	2.2	2.2	3.0
100 years or more	82.9	86.8	81.8	84.8	81.3	82.3
Don't know	1.2	0.4	1.4	0.7	3.3	1.1

What, then, do households prioritize as development priorities? More than 40 percent of all households chose "getting good education for children" from our proffered list. This desire for education, however, should not automatically be assumed as a demand for urban development, office buildings, industry or professional jobs (i.e. the capitalist landscape available to workers with college degrees, in broad brush strokes). Looking at the total picture of PCF's data, I suggest an alternative explanation: Present-day household needs might be met sufficiently — and thus the grip of precarity loosened — such that intergenerational mobility (or even liberation) promised by schooling can indeed be prioritized (though still not by a majority of respondents). Other "needs" were less common, though "protecting our existing way of living" was the second most popular.

Other survey findings lend support to households' widespread claim of comfort or sufficiency. Less than a quarter of households said the most important need could be met by a job outside fishing/farming, mainstream economic development or migration

(responses most closely associated with capitalism transformation). Meanwhile, in nearly 90 percent of households at least one member already possesses a high school education up to the 10th grade, while in more than 25 percent of households at least one person has at least a bachelor's degree (**Table 3.10**). While categories of land/land-use are difficult to measure via survey, abject landlessness is rare (**Table 3.11**). Nearly 19 in 20 respondent households own their home, almost half claim farmland and not quite one third have a stake in *gajni* wetlands. Just five percent of households claim no land/property at all.

Table 3.10 — Highest education of any household member (%)

	Full sample	*Agrarian production*	*Labor*	*Commerce, (petty) capitalism*	*Professional work*	*Misc.*
n	*995*	*479*	*287*	*138*	*91*	*268*
Up to 5th standard	4.2	4.0	4.9	2.2	1.1	5.6
Up to 10th standard but not 10th pass	6.6	7.1	10.8	5.1	0.0	4.1
10th standard passed	19.2	22.8	23.7	10.9	3.3	19.8
Up to 12th standard but not 12th pass	4.7	5.4	3.1	5.1	4.4	6.3
12th standard passed	25.7	28.4	25.1	21.0	14.3	24.3
Additional training/studies without obtaining degree, certificate, diploma	8.6	8.1	8.0	9.4	13.2	7.8
Vocational certificate / diploma or other qualification / certification less than four years	2.5	2.7	3.1	2.9	4.4	3.0
Bachelor's degree obtained	19.6	15.4	16.7	29.7	30.8	19.8
Some post graduate education (beyond bachelor's) without obtaining degree	0.3	0.4	0.0	1.4	0.0	0.0
Master's degree obtained	6.0	4.4	1.4	11.6	25.3	6.3
Studies beyond master's degree	0.6	0.4	0.7	0.0	0.0	1.1
Other	1.8	0.8	2.4	0.7	3.3	1.9

Table 3.11 — Households (%) with title, *patta* or a claim to land/property

	Full sample	*Agrarian production*	*Labor*	*Commerce, (petty) capitalism*	*Professional work*	*Misc.*
n	*995*	*481*	*285*	*138*	*91*	*270*
Our house/plot	93.3	95.8	93.0	96.4	94.5	91.1

Farm/field	45.3	50.7	47.7	56.2	47.3	47.0
Gajni land	29.8	36.6	35.4	36.5	19.8	20.4
Forest/plantation	16.2	22.7	18.2	27.0	16.5	10.0
Business property (shop/storage)	2.6	0.8	0.7	16.8	2.2	0.7
Other residential property (e.g. a rental)	0.8	0.4	1.4	0.0	0.0	1.1
We own no property	4.9	2.7	5.3	2.9	5.5	6.3
Other	1.8	1.0	2.8	2.2	1.1	2.2

5. Inequality and paradox

Yet our data also clearly show that some households have more than others, and some households who do report comfort, satisfaction and sufficiency likely even get there through the exploitation of others around them.[23] Reading across the tables above, examples readily appear where households that draw wages from labor fare "worse" than average while those that gain income from commerce/capitalism and professional work do substantially "better." Not quite seven percent of the sample explicitly disagrees that their household is "comfortable," and this subset of households (**Table 3.12**) unsurprisingly tends to produce *somewhat* fewer resources (cash or subsistence), have lower levels of education and appear more likely to work in menial labor jobs. Their development ambitions and needs also put *somewhat* higher emphasis on mainstream economic development and paying jobs, a trend also observed in interviews. Social and communal difference in the estuary (**Table 3.13**) also contributes to structural precarity and inequality,[24] according to interviews and observation. I note however that a household survey and semi-structured interviews, though chosen intentionally for reasons gestured to above, are hardly sufficient methods to fully understand and unpack trenchant oppression, exploitation or precarity. Further research including but not limited to local language ethnography would be necessary to critically reveal how the local abundance stratifies along axes of oppression and precarity.

Finally, I highlight a paradox clearly visible from survey data. As previously noted, fewer than one in ten households say they are interested in migration (and not one in 100 suggested it was their overall priority). At the same time, 79 percent do not wish for their children to continue in their line of work.[25] To what extent are respondents simply stating pessimism about agrarian futures (even if stated from a position of contemporary security)? How much do they contradict assertions of abundance and self-sufficiency? Does this instead lend credence to elite viewpoints (see **Table 3.1**) that frame the estuary's producer communities — and rural, coastal geographies more generally — as backwards

[23] Consider, however, that in interviews many of what might be considered "rich peasant" households also report having difficulty hiring additional hands at laborious points of the crop cycle. While PCF's data certainly identifies households who might fit the descriptor of "landless" laborers, this evident shortage — in the absence of obvious great outmigration — also suggests a limit to the local exploitation marginal agrarian workers.

[24] Inequality also remains among those who report being comfortable, with precarity partly distributed along class (which are routinely also caste/religion) lines.

[25] Also, a plurality (42 percent) of respondents prioritize a good education for their children as their top household "need."

and in need of development, "improvement" and upliftment? Is the actually existing agrarian landscape — abundant or otherwise — still to be fled or escaped? Put dramatically, are the livelihoods and lifestyles I have described here *only* arduous toil, drudgery or "hard life" that rural parents wouldn't wish on their children?

These are largely rhetorical (or at least academic) questions, though they also reflect much cynical policy and political wisdom about rural landscapes which frequently serve as hinterland for extraction or sacrifice zones simultaneously buffeted by winds of agrarian crises (cf. Edelman 2021; see also Shapiro and McNeish 2021). Considering PCF's data as a whole, I suggest rather simply that multiple propositions can be true at once. For a start, valuing education and desiring something other than the often physically demanding character of rural life for descendent generations seems an entirely common-sense ambition for households, without necessarily serving as a damming commentary about rural prospects always and everywhere. And households can surely enjoy and prioritize their own agrarian abundance (over destructive projects and plans) even while remaining relatively pessimistic about the longer-term (especially given their experiences of "development," including the contemporary Blue Economy).

Table 3.12 — Key statistics from households NOT "comfortable in our current lifestyle"

	n	%	Full sample %
Major household income sources:			
Selling own farm produce	67	16.4	23.5
Farm labor	67	22.4	17.3
Business labor	67	10.4	7.8
Government job	67	1.5	5.9
Office/professional job	67	0.0	3.6
Annual household cash income			
Up to 25,000 rupees	59	78.0	70.3
More than 25,000 and up to 50,000 rupees	59	6.8	6.2
More than 50,000 and up to 75,000 rupees	59	6.8	4.2
More than 75,000 and up to 1 lakh rupees	59	3.4	5.6
Household subsistence production			
Farm products	66	30.3	37.6
Fishery products	66	13.6	24.5
Nothing harvested for subsistence	66	12.1	10.9
Development ambitions:			
Agree area needs industries, large businesses and jobs	65	80.0	57.3
Agree that we are comfortable in current lifestyle	67	0.0	83.4
Agree area needs roads/schools/hospitals/infrastructure	66	87.9	81.4
Agree that big businesses will bring trouble	65	18.5	36.5
Agree that we want to migrate from area	66	18.2	9.5
Agree that we don't trust gov't projects to bring benefits	64	57.8	51.6
Agree that resources must be sacrificed for development	64	17.2	20.8
Agree that we hope our children can remain in our kind of work	67	13.4	18.7
Most important need of your household:			
Good education for children	67	40.3	42.1
Protect existing way of living	67	4.5	13.7
Good local job that is not fishing, farming	67	19.3	13.4
Migrating some or all of our family away	67	1.5	0.6

Highest education of any household member			
10th standard passed	66	29.9	19.2
Bachelor's degree	66	13.4	19.6
Household property			
Our house/plot	67	88.1	93.3
Farm/field	67	34.3	45.3
Gajni land	67	28.4	29.8
Forest/plantation	67	4.5	16.2
No property	67	10.4	4.9

Table 3.13 — Households (%) by social/religious community

	Full sample	*Agrarian production*	*Labor*	*Commerce, (petty) capitalism*	*Professional work*	*Misc.*
n	*989*	*477*	*283*	*138*	*91*	*266*
Hindu Other Backward Class (OBC)	75.7	83.2	73.5	77.5	64.8	70.3
Muslim	9.6	11.1	8.5	7.2	7.7	9.0
Hindu Scheduled Caste (SC)	7.8	2.5	14.1	3.6	4.4	11.3
Other Hindu	5.9	2.7	2.8	9.4	20.9	8.6
Christian	0.6	0.0	1.1	0.7	1.1	0.4
Adivasi/indigenous/Scheduled Tribe (ST)	0.2	0.2	0.0	0.0	0.0	0.4
Other	0.2	0.2	0.0	1.4	1.1	0.0

Abundance and the dream world of development

These data — drawn from months of research conducted by an NGO team — describe an ecology and economy dominated by peasant production. A majority of our respondents do indeed demand "development," but they also remain skeptical of "transitions" to capitalist agriculture, a future of wage labor or out-migration to cities. Better than four in five respondents explicitly agree that they are comfortable in their current lifestyle." Estuarine communities along this stretch of coast have long histories of attachment to their land and livelihoods as well as a notable post-colonial habit of refusing industrial projects, including the proposed-but-stalled industrial port that would upend life and livelihood while destroying local ecology. I mark this resistance specifically as a (possibly latent) politics that seeks to maintain and protect an agrarian *abundance* derived from livelihoods and lifestyles rooted in a more-than-market, social existence.

Scholars of agrarian political economy since Kautsky (1988) and Lenin (1956) have found peasantries persisting and reproducing themselves amid the reorganization/subsumption of agriculture, though often through self-exploitation (or exploitation of others even more marginalized) in de facto service to capital (rather than out of resistance). The ways in which this side-by-side existence of peasant production and capital continues (or not) and for whose benefit remain core concerns of the contemporary "agrarian question":

> "…defined as the continuing existence in the countryside of poor countries of substantive obstacles to an unleashing of the forces capable of generating economic development, both inside and outside agriculture. It represents a failure of accumulation to proceed adequately in the countryside – that

> impinging powerfully upon the town; an intimately related failure of class formation in the countryside, appropriate to that accumulation; and a failure of the state to mediate successfully those transitions which we may encapsulate as the agrarian transition" (Byres 1995: 509).

In India, this question has been asked repeatedly both as a matter of analytical and political practice. This chapter is hardly the place to rehash the illuminating but potential oxbow of the "modes of production" debates in India in the 1970s and 80s; in sum, numerous scholars — e.g., Alavi (1975), Banaji (1972), Patnaik (1971), Rudra (1975), Alice Thorner (c.f. 1982) and others — sought to understand how capitalism had or could develop specifically in Indian agriculture through the "colonial mode of production," or the recombination and expansion of "antediluvian" forms of capital — merchant, petty trade, usury, land rent — that were inhibited from industrial transformation by colonial projects (Patnaik 1972). While the participants debated furiously points of history and political economy, they generally agreed that "the capitalist transformation of the rural petty commodity production accordingly will be a diverse, differentiated process determined by the mix of capitals and their respective modes of expansion in agriculture" (Goodman and Redclift 1982: 94). These were hardly intellectual debates alone; they also occurred alongside and in reference to actual agrarian policy, politics and the enactment of development (cf. Gupta 1998). One result of this social differentiation has been today's uneven agrarian landscape populated by multiple social classes of peasant and capitalist.

This splitting and fracturing over time appears in the Aghanashini estuary today in the sheer diversity of aims, crops, means of production, labor relations, extent of exploitation and market enthusiasm/skepticism of households. In PCF's data, some producers indeed look like poor and middle peasants of classic agrarian theory (cf. Lenin 1956), while smaller numbers have transitioned into successful petty commodity producers or even entrepreneurial capitalists. The most marginalized households — ones who say they are not comfortable and are more likely to want economic development, wage jobs or even out-migration — may even represent trends of depeasantization or rural proletarianization. All such agrarian development (or lack thereof) also today occurs in relation to local, regional, national and international capitalist economies. In political economic terms, "the nub of the problem" remains:

> "how to characterize small commodity producers when their real subsumption to capital is incomplete — that is, they retain possession of the means of production and exercise some control over the immediate labour process, so they are not wholly dependent on the wage-form for their reproduction" ((Goodman and Redclift 1982: 97)

In this paper, I have insistently chosen to characterize the Aghanashini's producers as peasants, flagging them as not fully subsumed or dominated by capital. The extent to which this is more than transitory or ephemeral remains to be seen.[26] Contemporary agrarian debates — whether the agrarian question has been bypassed (Lerche 2013), whether rural

[26] A future more directly queried in **Chapter 6**.

peasants are now surplus to the accumulation of capital (Li 2010), whether the corporate international food regime can be opposed by a cross-class alliance (McMichael 2009) — merit a separate treatment for coastal India today, especially considering the development policy of the rightwing Hindu nationalist government seeks to unleash market forces in agriculture and real estate (Balakrishnan 2019; Lerche 2021; Lerche and Shaw 2018; Levien 2018; Kumar 2021).

I have suggested, however, that an answer to the question of the fate of the peasantry — and whether Aghanashini producers are anything more than petty commodity producers — is at least partly a question of framing, analysis and comprehension of peasant production in a way that doesn't foreclose the future or uncritically accept the concept of "agrarian transition" (N.B. Goodman and Redclift 1982). In place of more firm conclusions, I shall content myself with offering a provocation: Academics, journalists, politicians, policymakers, bureaucrats, activists, humanitarians, environmentalists and even entrepreneurs suffer analytical *and* political failures of imagination when they assume that extraction, despoliation and/or dispossession are the only fates remaining for small, cash-poor rural agrarians.

In this elite, uncritical imaginary, a dynamic peasant ecology and economy such as the Aghanashini's appears "backwards," full of ignorant people engaged in menial, unproductive activity, toiling without basic comforts.[27] Seen through this "developmentalist" lens, the peasantry's lack of reliance on a money economy and stubborn (material and cultural) attachment to land, water and their own means of (re)production are transmuted into a description of abject poverty that becomes definitional and a practically a metonym for small-scale production, especially fishing (cf. Bene 2003; Jadhav 2018). Reduced to a collection of statistics about their supposed backwardness — poverty line headcounts, asset inventories, health metrics and other tools of representation, prioritization and conceptualization (Fischer 2019) — rural people become dismissible (even disposable) whenever they stray from or contradict dominant political economy and the trajectory of neoliberal "development." Protesting rural people such as Aghanashini residents can be ignored (or worse) as noneconomical, superstitious and uncompetitive; they lack entrepreneurial spirit or ambition as well as basic material assets and useful capital. These deficiencies also provide justification for "improvement" through measurable technical interventions (cf. Li 2007) and most lately, the dreams of oceanic-scale capitalism via the Blue Economy (cf. **Chapter 4**). Ultimately, public and private development discourse in India adopts a "synoptic view," reducing and flattening peasant ecology and economy in all its contradictions and complexity (cf. Scott 1998) into undifferentiated rural backwardness. Put another way, rural, coastal producers who do not intensively or enthusiastically embrace wage labor or those communities that prioritize their own subsistence (re)production over commodity production are potentially non-modern,

[27] If this seems too much like a paper tiger caricature, consider that gemstone trader and tourism prospector quoted in **Chapter 2** wept in pantomime during a dinner discussion — where fish was served — over the plight of "these poor fishermen who have nothing," a condition which explicitly justified their dispossession and relocation from their beachside houses to make way for luxury property development. In return, displaced coastal people would be promised "more money than they could ever dream of." The shipping port's EIA is equally condescending at times about "development" around the estuary.

obsolete or even subversive, any of which would make them an obstacle to national progress and improvement.[28]

I do not deny that crises of agrarian political ecology and economy are real and continually manifest across India (Kumar 2024; Lerche 2011; Mishra 2020; Patnaik 2003; Walker 2008) and the planet, but they are far from inevitable or uncontested (cf. Nilsen 2018). The withering of rural, agrarian life and livelihood is neither an immanent process nor a necessary condition of "development" or "modernity." Rather, critical scholarship from across the social sciences — and especially agrarian, peasant and development studies — demonstrates how rural *and* urban poverty and immiseration are *(re/co)produced* by, through and against politics, economic activity and the powers of non-human natures, the environment and the planet.[29] In poverty's uneven, relational geography, the poor exist alongside, because of and (also) despite incredible wealth, while deprivation and desperation have their root causes in the uneven development (Massey 1994, 86-114; Smith 2008) and predations of (post)colonial racial capitalism that reinforces and is reinforced by hierarchy, inequality and marginalization (Gilmore 2002; Koshy, Cacho, Byrd, Jefferson 2022; N.B: Robinson 1983).

One goal of this essay, then, has been to document and explicitly name the Aghanashini's peasant *abundance* as a kind of counter-spell or contradiction to the enchantment of "agrarian transition" that simultaneously undergirds elite dreams of estuarine development. Put a different way, PCF's research performs a heuristic, evidentiary and potentially defensive "counter-mapping" (cf. Nietschmann 1995; Peluso 1995) of the estuary's economy and ecology against prophecies of peasant extinction and inevitable agrarian scarcity.[30]

Consider that scarcity is the conceptual foundation for many development-related disciplines (e.g. economics in general and environmental economics in particular) and frequently appears as a precursor or condition of possibility for environmental politics or intervention. Even in otherwise revealing environmental histories, auto-declensionist narratives and (neo)Malthusian assumptions (Hardin 1968; Malthus 1790) often remain quietly in the background (cf. McEvoy 1986). In many of these stories (and their disciplines), a particular abundance — usually of biology or ecology — may exist before transformation, transition or tragedy (e.g. new commercial uses, demographic changes, political conquests) brings about scarcity. Formerly abundant "resources" become rare in the grind of capital's creative destruction. The rush to lay claim to natural abundance makes it precious. Environmental managers, supposedly sustainable developers or even populist politicians tend to promise to ameliorate the effects of scarcity (e.g., through property rights, middle class environmentalism, safety net social spending, cash payments

[28] While exhortations to sacrifice for national development have suffused Indian patriotism since before Independence, they take on new meanings in the age of Hindu nationalism (**Chapter 4**).
[29] While any number of citations would do, good places to start on development and poverty are Allen (2021), Chari and Corbridge (2008), Lawson and Elwood (2018) and Sachs (2010). For particularly compelling accounts of how the production of poverty by capitalism has been a long-standing process bound up in European racialized conquest see Watts (1983) and Davis (2002).
[30] PCF's survey data is indeed georeferenced enabling future counter cartography.

to the poor) or its exploitation (through boosting production, export production, financialization, the economist's "rent-seeking behaviors"); less frequently do they plan for production of a non-capitalist abundance.

We should not be surprised given both the general storytelling of capitalism's acolytes and its predatory and expansionary logics and modes. Indeed, volumes have been devoted to fine-grained Marxist political economy that explicates the very concept of "rent" —integral to the development of capitalism and unfolding of colonial projects (e.g. British India) and fundamentally premised on scarcity. Over-simply put, if land, material goods, a clean environment, the "free gifts of nature," etc., are not scarce, they cannot become the basis of capitalist appropriation and capture of (unearned) rent through freehold, marketable property rights.[31] As Lloyd (2016: 209) argues:

> "Perhaps, then, we need to recognize that precisely what neoliberal capital fears is abundance and what it implies. Abundance is the end of capital: it is at once what it must aim to produce in order to dominate and control the commodity market and what designates the limits that it produces out of its own process. Where abundance does not culminate in a crisis of overproduction, it raises the specter that we might demand a redistribution of resources in the place of enclosure and accumulation by dispossession. The alibi of capital is scarcity; its myth is that of a primordial scarcity overcome only by labor regulated and disciplined by the private ownership of the means of production. In a state of generally accessible abundance, on the contrary, could there be exploitation, labor discipline, subjugation?

And yet *abundance* remains regularly undertheorized or reduced conceptually to the absence of scarcity (Alatout 2009). More and more critical deployment of abundance as a category offers the chance to begin to understand how it comes to be, is produced (materially and discursively) and has been or can politicized. Alatout's exceptional history of water and Zionist settler colonialism in Palestine demonstrates the importance of paying attention to the production, narration and (de)politicization of abundance, "constructed as a political category and made into a strategic resource for managing relations of power and conflict. (In the history of Palestine's water), abundance justified and sustained relations of power and dynamics of domination" (2009: 383). Similarly, in Weber's history of U.S. fisheries, we implicitly see abundance of oceanic resources enrolled repeatedly into efforts to preserve capitalist fishing profits and forestall discussions and legislation over management (2002). In Alatout's and Weber's examples, abundance discourses are actually purposed to serve dominant political economic interests (ethnonationalism/settler colonialism and capitalist enclosure of the marine commons), though I argue the Aghanashini case demonstrates how abundance politics can have a critical, radical or even liberatory horizon. Put another way, abundant environments offer a basis for eliminating unfreedoms (Ranganathan 2017; cf. Sen 1999;).

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[31] Patnaik's 2007 edited volume on Marxist thought and "the agrarian question" is a good introduction to the deep end of the pool.

This is the particularly exciting project of Fujikane (2021), who identifies as a settler ally, in exploring Kanaka Maoli (Native Hawaiian) knowledges, epistemologies, politics and cartographies important in the (re)production of abundance in the face of multiscalar crises of capital (foremost, planetary climate change). In the process, she demonstrates a dual method for "critical settler cartography," that she outlines straightforwardly: first, exposing "the grandiose claims, contradictions, erasures, and ideological interests that drive settler colonial cartography," and second, "move the critique into the expansiveness of [indigenous] cartographies that map familial relationality among humans, lands, and elemental forms, plant and animal 'ohana (family)" (18). I do not wish to uncarefully or crudely travel ideas and critique,[32] but my research shares intention with her pursuit of other-than-capitalist abundance:

> "The struggle for a planetary future calls for a profound epistemological shift. Indigenous ancestral knowledges are now providing a foundation for our work against climate change, one based on what I refer to as Indigenous economies of abundance—as opposed to capitalist economies of scarcity" (3).

Returning to the Aghanashini, I offer a final example to show both the stakes and potential of insistently looking for, naming and "counter-mapping" peasant, indigenous and other subaltern and non-capitalist means and modes of producing abundance. Let's consider briefly again the environmental and social impact assessments produced for the proposed shipping port within the estuary. Though mandated by federal environmental protections, independent environmental and social impact assessments in India today are easily gamed by developers and promoters. Economists might blandly describe this rigging of environmental monitoring as rent-seeking behavior; understood critically, this kind of EIA corruption — described once to me by a participating developer — is only one of many public and private strategies to manufacture consent for sacrifice in the name of "development." A quasi-governmental organization, the National Environmental Engineering Research Institute (NEERI), "researched" and wrote the assessment with guidance from the promoter (another state agency working on behalf of a future private industrial developer). The report reproduces boosterish language praising the proposal while still being littered with inaccuracies, plagiarisms, omissions, shoddy research, unqualified opinions, bad math and terribly wishful thinking. PCF's own line-by-line analysis (printed and distributed to community activists and state officials), documented *pages* of errors and worse. Lengthy sections on ant biology from Wikipedia and large portions of a scientific study on oyster harvesters were plagiarized and presented as NEERI's own fieldwork. At a 2015 public hearing on the EIA, project promoters defended the report when confronted and continued to deny its many mistakes. A group of organized hecklers also shouted down critics, and afterward at least one snoop for the federal government's Central Bureau of Investigation openly took down names of prominent people vocally against the report. The outcome was a laughably faulty evaluation that

[32] I note that I am neither an indigenous scholar nor a scholar indigeneity in South Asia and do not attempt to interrogate the many contradictions, conflict and complex relations that remain globally between peasant and indigenous communities (themselves not always mutually exclusive).

downplayed, overlooked or blatantly lied about the seriousness of project impacts on the estuary.

This story demonstrates how a supposedly democratic tool for providing transparency and independent evaluation can be successfully and easily hijacked for capitalist dreaming (see also **Chapters 4** and **6**). Project boosters (including private capital waiting in the wings) worked side-by-side with contracted expert monitors who generated and published an obviously faulty assessment. Produced by a government institute to serve as a supposedly impartial record for environmental regulators, the EIA report has the veneer of official authority and expertise even though its relation to on-ground reality remains tenuous. This enables the EIA to perform admirably as a discursive object, setting the terms and supposed "facts" for a debate about development. The result is a state-produced, legally mandated document that helps narrate a peasant ecology and economy as available for transformation by capital. Economists might blandly describe such rigging of environmental monitoring — explained straightforwardly to me without a hint of shame by a project developer — as rent-seeking behavior or a rational response to bureaucratic paralysis (cf. Lambsdorff 2002). Understood critically and practically, however, this kind of "corruption" offers one of many strategies to manufacture consent, in a Gramscian sense, for sacrifice in the name of "development." The EIA's narrative also feeds and is fed by elite and external imaginaries of the estuary laid out above, (re)inscribing the prophecy of peasant doom.

Notably, the ill-conceived, destructive project was *not* stalled by EIA safeguards, which were actually put to use by project promoters to smooth discursive and political frictions. Instead, the port succumbed to sustained-if-low-grade resistance from a loose coalition of outspoken resident fishers, farmers and business owners alongside local and regional activists, NGOs (including PCF), scientists, journalists, students and others who all named and politicized the project's actual, terrible costs to the estuary's economy and ecology. Scholars and civil society groups, including PCF, published analyses, convened meetings, wrote letters and worked institutional channels. PCF's research (never separable from its activism) meanwhile heard routine criticism and skepticism about the port passed along in everyday conversation (and the survey counted widespread rejection). Of course, this opposition had internal differences over specific means and ends, and I have no wish to oversimplify the case into a binary of predatory state/capital, on one side, and an idyllic community of peasants, on the other.[33]

What opponents of the shipping port broadly shared — and often organically acted on — was the goal of preventing the destruction of the estuary's ecology and economy. In more radical words, the port project was "abandoned due to resistance from the local people" (Deccan Chronicle 2023), both supported by and protective of peasant abundance (and its conditions of possibility). Considering the strength of the agrarian transition telos

[33] Certainly some wealthier land and business owners as well as some prominent members of a local upper-caste community organized in favor of the port, sharing the elite narrative of regional underdevelopment and the "backwards" character of local agrarian households. At the same time, multiple elite civil society groups from Bangalore and Delhi actively supported local peasant activists.

(cf. Goodman and Redclift 1982) in development political and policy circles today, I am tempted to see shades of a defensive Polanyian (1944) "counter movement" or what Li (2009) fruitfully identifies as a biopolitical agenda to protect, preserve and "make live" peasant producers who face dispossession and despoliation. And the politics of "making live" advocated by Aghanashini residents and their allies for maintaining abundance stand in sharp relief to the Blue Economy agenda of "letting die" the small-scale coastal producer in favor of shipping ports and capitalism at sea.

Peasants and other small-scale/subsistence producers face challenges from capitalist forces in one guise or another in every agrarian geography. Climate change will only exacerbate existing unsustainabilities and injustices while also posing a real threat to capitalist production systems' ability to function at all. Pro-poor agrarian politics and policies that aim for "making live" (or perhaps "keeping alive") and producing abundance will only be more crucial (Fujikane 2021; Lloyd 2016), but the actual concrete details must be squarely in the hands of the rural communities themselves. Prescribing what peasants should do is neither my aim nor my ability. In keeping with critical agrarian studies (cf. Bryceson, Kay and Mooij 2000; Levien, Watts and Hairong 2018; Moyo, Jha Yeros 2015; among others), I have sought to productively open up the categories of "peasant" and "abundance" for both analysis and politics. Doing so has continually revealed for me the Aghanashini's robust, dynamic ecology and economy, one that remains capable of producing an agrarian abundance sufficient to support and motivate its further defense. Perhaps the reports of the death of the peasantry are greatly exaggerated.

Chapter 4 | Unsustainable, imperial dreams: What India's Blue Economy portends for "life below water"[1]

Introduction

Development discourse today in India and internationally routinely hails a two-faced, almost duplicitous "nature" to the ocean. According to many policymakers and (increasingly nationalist) economic planners, the world's seas constitute an almost unfathomable trove of resources waiting for scientists, workers, capitalists and, above all, nation states to claim them. And yet, we are told, marine geographies from the shallow estuary to the deepest trench, are simultaneously vulnerable to reckless consumption and despoilation. Sometimes speakers offer both perspectives at once, as did then Science and Technology Minister Harsh Vardhan during a 2015 speech at the National Institute of Oceanography (NIO) in Goa.

> "The ocean and its resources are increasingly seen as indispensable in addressing multiple challenges the planet is facing in decades to come. By 2050 enough food, jobs, energy, raw materials and economic growth will be required to sustain a world population of nine billion people… But it (ocean) is already under stress from over exploitation, pollution, declining biodiversity and climate change. Hence realizing the full potential of the ocean will demand responsible, sustainable approaches to its economic development… Therefore, I urge you all to see urgency in our situation. We must move fast to grab India's legitimate share in the emerging ocean-based industries, which also include seabed mining for metals and minerals, marine aquaculture, marine biotechnology, ocean-related tourism and leisure activities and most importantly, ocean monitoring, control and surveillance" (PTI).

NIO is one of an alphabet soup of acronym-laden government agencies in India — e.g. CIFT, CMFRI, INCOIS, ISRO, MOEFCC, MOES, MPEDA, NCSCSM, NFDB, NIOT, NITI-Aayog, among others — committed to the proposition that India urgently requires aggressive oceanic development, at once nationalist and capitalist. The very expanse of the ocean underwrites dreams of wealth waiting to be tapped — or grabbed, per Vardhan — from a kind of *aqua nullius*, an under-utilized, three-dimensional watery geography of fantastic proportions.[2] In this so-called Blue Economy, sea lanes, fish, minerals, tides, currents, breakwaters, the beach and even carbon-sequestering and cyclone-buffering mangroves are reimagined as new inputs to a program of national development (cf. Barbesgaard 2017; Carver 2019; Childs & Hicks 2019; Mallin & Barbesgaard 2020; Silver et al. 2015). Accordingly, India's future "success" depends on claiming and making best use of its Exclusive Economic Zone

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[2] I repeatedly hail the fantastic, dream-like quality of India's oceanic ambitions — contradictory, wishful, unreal, inchoate and/or fleeting — inspired by a range of critical scholarship engaging late capitalism's dreamscape (e.g. Anand, Gupta and Appel 2018; Benjamin 2002; Buck Morss 1995; Cross 2014; Larkin 2013).

(EEZ) and coastal space as rightful territory and property of the nation. The Blue Economy then serves to imbue national and capitalist development ambitions with an expanded territoriality, despite the ocean's resistance to both property regimes and the jurisdiction of the nation-state system (cf. Germond-Duret 2022).

This dominant imaginary of limitless oceanic resources is not so much contradictory as relational (perhaps even dialectical) with a twinned narrative of an ocean under threat. Consider that presumptions of the ocean's inexhaustibility — an echo of colonial-era science and policy still persistent today — have prompted all manner of overharvesting, unchecked dumping and widespread chemical and biological runoff. Scholars and Activists have repeatedly brought attention to the plight of coastal communities, and especially fishers, facing environmental degradation, appropriation of ecological commons and the loss of livelihoods (Ali et al. 2021; Kanan et al. 2020; Research Collective 2018). Ignoring such criticism, Narendra Modi, prime minister and suzerain of India's ruling Hindu nationalist Bharatiya Janata Party (BJP), hails his Blue Economy "vision for a sustainable and prosperous future" (2015) and pads policy and campaign speeches with blandishments such as "our lifestyle, transport systems and trading behavior should not spoil the ecology of the oceans" and "there is a need for holistic and sustainable development of coastal regions and communities" (2016). Other Indian planners and politicians parrot a flexible mantra of "sustainability," switching deftly among abstract proclamations and fantastic promises that development on the coasts or at sea *should be, already is or will shortly be* sustainable, while remaining profitable (cf. Thakur 2022).

Yet the meaning of oceanic sustainability — in science, policy or practice — is too often unspecified or glossed over. This problematic — the submergence of critical sustainability within an oceanic agenda both nationalist and capitalist — serves as my point of departure. In this chapter, I read the political and economic agenda of ocean development through and against India's practical engagement with the United Nations' Sustainable Development Goals (SDGs), and specifically SDG 14, which concerns "Life below Water." Part aspiration and part pledge, the "goals" are to be measured by dozens of statistical indicators. Like the Millennium Development Goals (MDGs) before them, the SDGs treat "development" as a discrete condition that can be measured and tinkered with. In this framing, individual countries fit national data to internationally agreed indicators and then track and report their progress. Architects and proponents of the SDGs tout this voluntary system of monitoring and feedback as transformative of the (implicitly) unsustainable trajectory of global capitalism. Yet the meaning of sustainability remains ambiguous and flexible, subject to expedient definition for political (and political economic) ends, while development in actual practice remains shot through with fantasy and wishful thinking. Just listen to then Vice President of India, M. Venkaiah Naidu, in 2019: "The Blue Economy will aid in achieving the 14th goal of United Nations sustainable development goals." Here, the discourse borders on tautology, where simply hailing the ocean economy as "blue" assumes sustainability by default.[3]

[3] Note how the Blue Economy is an oceanic mirror to the so-called Green Economy (cf. Bratman 2015; Cavanagh and Benjaminsen 2017).

Two disclaimers are appropriate. First, India's oceanic development ambitions are hardly novel. Whatever its intensity, contemporary Blue Economy discourse (cf. Silver et al. 2015) echoes longue durée histories of capitalist development and territorialization at sea (Campling and Colás 2021). Likewise, framing nature and ecology as crucial assets for nation-building, economic growth and expanded/improved (re)production repeats policy/praxis of both British colonial and postcolonial national governments.[4] Second, not all claims of "sustainability" are necessarily specious. A range of actors and interests collaborate on and contest the agenda of development (and the related keyword, improvement), sustainable or otherwise, sometimes with radical intent. Li (2007) cautions "the rush to identify hidden motives of profit or domination narrows analysis unnecessarily." Rather than pronounce oceanic development plans and policies as only tragedy or farce, this chapter seeks to unpack how sustainability — and the SDGs as discursive objects reinforced by performance and practice — accomplish work for other agendas and ideologies. In the case of India, I will ultimately argue that abstracted "sustainability" helps suture together a muscular nationalism and a neoliberal capitalism under the sign of Blue Economy.

The remainder of the chapter proceeds as follows. In the next section, I historicize sustainable development in order to unsettle a concept frequently deployed as though self-explanatory, uncontested, or ahistorical. Then, I briefly present the SDGs and their evolution into discursive objects and exemplars of development's fetishization of quantification. The subsequent section examines India's performance of the SDG process — focusing on Goal 14 — which effectively produces an abstract notion of oceanic sustainability made available for other projects, namely the Hindutva-infused Blue Economy agenda. Contra this development imaginary, a penultimate section highlights actually existing *un*sustainability at the scale of an estuary. Finally, a conclusion reiterates the claims of the paper and concludes that India's oceanic agenda articulates both nationalism and neoliberalism into a neoimperial dream.

Sustainable development as keyword

Though historically contested, the origin stories, meanings and methods of development have "rarely broken free from organicist notions of growth and from a close affinity with teleological views of history, science and progress" (Watts 1993). A robust intellectual history — beyond the scope of this chapter[5] — would cover the rise of modernist, Orientalist binaries about "the West and the Rest" (Hall 1996) coincident with the expansion of Western colonialism/capitalism and paradigms of economism, scientific management (of people and resources) and notions of linear progress. Development carries this baggage and "inheritances" of imperial and colonial projects that sought to build a hierarchical world: "What obtained prior to development, either in the form of pure

[4] A wide range of scholarship concerns the intersections of British colonialism, scientific management and the development/improvement of "nature" (Cederlöf & Sivaramakrishnan 2014; Grove 1997, 2003; Grove, Damodaran & Sangwan 2000; Damodaran, Winterbottom & Lester 2015; Drayton 2000; Nandy 1999; Rangarajan & Sivaramakrishnan 2011), though comparatively little attends explicitly to marine spaces and places amid empire.

[5] Watts' series of articles in *Progress in Human Geography* (1993, 1994, 1996) are a good starting point. See also Chari and Corbridge (2008) and Allen (2021).

nature or non-Western subsistence, did not have, we were told, the rationality, slickness and efficiency of modern science. People, societies, nature itself were backward because of its absence" (Alvares 2010). Varying accounts, more and less critical, trace development's rise as a project of state intervention to the twilight of formal empire and the British Colonial Development and Welfare Act, both placation from above as well as a demand from below (Cooper 1997; Furnivall 1948; Hart 2001, 2010). Late colonial interventions in social and economic space continued postwar, and Sachs (2010a) suggests "the age of development" proper begins with U.S. president Truman's 1949 inauguration speech calling for: "a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas." In this formulation, development becomes a discrete condition conflated often with high economic growth and income. Geographies can possess or lack development. States can measure and then bolster levels of development (e.g. caloric intake, household income or "modern" technologies). This dominant framing implies a process of catching up, overcoming primitivity and progressing linearly through stages (cf. Rostow 1960). Here development is neither relational nor the outcome of historical, uneven global capitalist relations, but instead a technical, even *apolitical* exercise.

Guided by central planning, elite interests and "expert" rule, postcolonial leaders in the Global South often embraced so-called modernization, depeasantization and demographic transition and the like as crucial to becoming a "developed" nation-state. Poverty, famine and inequality — themselves often colonial legacies (cf. Davis 2002; Watts 1983) — amplified the urgency for material gains. In India, the development regime started under British colonialism would turn to central economic planning, cooperative producer societies, public corporations, state science agencies, government food procurement/distribution, new extractive industries and more (Ludden 2005), all guided by calculations of India's economic assets and deficiencies.[6] Nominally disconnected from the international economy, India practically began relying on foreign aid, technology and expertise, in projects ranging from Green Revolution agriculture to massive, multi-scalar dams to the spread of commercial fishing trawlers (Baviskar 1995; Kurien 1985; Patel 2013). Consequent destruction of traditional livelihoods, mass-scale land appropriation, rising inequality and ecological devastation would engender peasant resistance and counter claims for alternative forms of development (Peet & Watts 1996; Rangan 1996; Sachs 2010b).

By the 1980s in India, "neo-liberal free-market orthodoxy conquered the economic mainstream, where harsh critics of state planning, provisioning and regulation become most influential" (Ludden 2005, 4047). The multiplying burden of international debt and a foreign currency shortfall forced the country into economic "liberalization" in 1991, as a condition of International Monetary Fund lending. Nehruvian state-managed capitalism gave way to neoliberal policy: new land grabs, falling tariffs, reduced import-export restrictions and the gutting of state social safety nets (see also Harvey 2003). Despite the

[6] For example, The National Council of Applied Economic Research produced state-by-state techno-economic surveys in the 1950s and 1960s largely repeating colonial narratives of India as deficient in capital, industry, infrastructure and entrepreneurial spirit.

discourse of free markets and enterprise, this period of development in "New India" was underwritten by active policy, interventionist planning and "regimes of dispossession" (Levien 2018; Sud 2021) often worsening inequality, environmental degradation and loss of (especially rural) livelihoods (Le Mons Walker 2008).

Sustainability, meanwhile, appeared as a term of science in the early 18th-century context of long-term forest management (Scoones 2007). Fears over environmental degradation — often driven by dubious Orientalist prejudice (cf. Davis 2007) — crept into imperial aims of environmental management alongside goals of "improvement" (Drayton 2000). Peasants and other subjugated often rural producers were frequently blamed for what colonial rulers thought of as under-utilization; in India, for example, Francis Day (1873), the first British inspector general of fisheries in India, insistently promoted management of "waste" and "destruction" of resources by fishers (1873).[7]

The idea of sustainable development enshrined in the SDGs draws specifically from a "Malthusian moment" (Robertson 2012) in the latter half of the 20th century.[8] Recognition of the ecological cost of industrial capitalism merged with critiques of colonial and postcolonial development, generating new forms of environmental politics from above and below in Global North and South (Adams 2001; Conca and Dabelko 2010; Guha and Martinez-Alier 1997; Peet & Watts 1996). From the 1960s, international development agendas turned to fertility and birth control (cf. Murphy 2017), while concerns over "limits to growth" (e.g. Meadows et al. 1972) and "overpopulation" (e.g. Ehrlich 1968) produced specious Global North fears of postcolonial masses devouring global ecology (despite their actually meagre consumptive footprints). At the 1972 U.N. Conference on the Human Environment, India's prime minister Indira Gandhi — one of the few Global South leaders to attend — famously pushed back, decrying uneven, "reckless exploitation of man and earth in the name of efficiency" driven disproportionately by industrial, capitalist nations (Robbins 1972).

The dyad term of "sustainable development" entered policy debates alongside a flowering of critical literatures: mathematical ecology, political ecology, critical development studies, environmental sociology and agrarian political economy to name a few. In 1987, the U.N.'s World Commission on Environment and Development published *Our Common Future* with a now-popular definition: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own

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[7] Notably, European "science" of the period considered the possibility of fisheries collapse an open question, with no less than Thomas Huxley arguing that "probably all the great sea fisheries are inexhaustible" (Huxley 1883).

[8] Thomas Malthus' famous *Essay on the Principle of Population* (1798) foreshadowed contemporary sustainability politics. Malthus proclaimed a "natural law" that geometric population expansion would outstrip land under food production, but the tract also defended existing class hierarchy and argued that poverty reduction would only encourage the masses in their improvidence (Harvey 1974). Malthus advocated "benign neglect" of the poor, forcing them to serve emergent industrial capitalism or starve. Implicit in Malthusian political economy, then, are concerns about relationships among demography, modes of development, state policy, environmental scarcity and overpopulation — all elements of "liberal government of life" (Dean 2015) and enduring keywords today.

needs." Concurrently, new environmental movements increasingly resisted mega projects: hydroelectric dams, forest-clearing highways or nuclear weapons alongside quotidian expropriations of land and livelihood. This intellectual and political foment would crescendo until the 1992 U.N. Conference on Environment and Development (popularly known as the Earth Summit) in Rio de Janeiro, one of the largest civil society gatherings ever. Despite grassroots involvement, neither sustainability nor development would shed ideologies of ecological modernization and liberalism; techno-utopian innovation, market efficiency, free trade, environmental cost accounting, private and individual responsibility all combined in the sustainable development paradigm (Bratman 2019), deployed from the smallest community NGOs to the commanding heights of the global economy.[9] By the mid-2000s, "there is nothing, it seems, that cannot be described as 'sustainable': apparently everything can be either hyphenated or paired with it. We have sustainable cities, economies, resource management, business, livelihoods – and, of course, sustainable development" (Scoones 2007, 589).

Continued policy failures globally would also spur promulgation of the U.N. Millennium Development Goals (MDGs), a set of big-picture ambitions for tackling poverty, hunger, education gender inequality, public health and, yes, sustainability (Hulme 2009; MacArthur 2014). Proponents hailed the "power of numbers" to mobilize attention urgently; the eight "goals" with 21 targets tracked by 60 indicators were ostensibly to be achieved by 2015. The MDGs' emphasis on metrics, however, reduced complex problems and multivalent social relations to that which is quantifiable (Fukuda-Parr and Yamin 2013), and they can be critically understood as "an ambitious and broadly hegemonic attempt to rearticulate the development project and produce entrepreneurial neoliberal subjects" (Death and Gabay 2015).

MDG environmental targets/indicators were largely vague; in some cases assessment only captured spectacular failure to transition economies away from fossil fuels and carbon emissions (Liverman 2018). Their ultimate failings to achieve "development" would provide impetus for creating the SDGs at a new international agreement at 2012 U.N. Conference on Sustainable Development (also known as Rio+20), 25 years after the Brundtland Commission report (Carant 2017). The eight MDGs were reborn as 17 SDGs with 169 targets and 231 unique indicators as of 2022 (United Nations Statistics Division). Thus expanded, the SDGs officially proclaimed that development required healthy ecologies and environmental life support systems (Fukuda-Parr & McNeil 2019; Griggs et al. 2013), while further enmeshing development in the production of measures and metrics.

The SDGs, discourse and quantification

Like the MDGs, the SDGs idealize development as a discrete condition — that of being developed — which is achieved by meeting goals (e.g. "No Poverty") composed of targets (e.g. "by 2030, eradicate extreme poverty for all people everywhere") tracked by indicators

[9] The World Bank began to use the term "sustainable" by 1989 (see Landell-Mills, Agarwala & Please 1989), though often in the business sense of sustained operation rather than as environmental and ecological concern.

(e.g. "proportion of the population living below the international poverty line"). In theory, data produced transparently will identify "deficiencies" and needed interventions. Thus the SDGs reinscribe a colonial imaginary of development: some*thing* a population desperately needs in order to catch up, civilize or modernize. Continuity with the past, however, casts doubt on whether SDGs truly contain radical potential to challenge existing development inequalities (Brown 2016; Death and Gabay 2015; Mawdsley & Taggart 2022). Despite methodological, ideological, political and practical critique (Blyth et al. 2018; Esquivel 2016; Liverman 2018; Sexsmith &McMichael 2015; Sultana 2018 among others), the SDGs approach hegemony in influence. They underpin multilateral agreements; justify policy across scales; condition development aid, lending and investment; but also create opportunities for political struggle.

The SDGs sit alongside dozens of indexes and rankings — what scholars have come to call "global performance indicators" (Kelley and Simmons 2020) — that purport to measure development. An ever-expanding cast of NGOs, thinktanks, state agencies and individual scholars churn out measures and metrics to the point of competition and redundancy. U.N. programs routinely calibrate activities to the Human Development Index or Oxford's Multidimensional Poverty Index. To attract capital, governments promote their rankings in the World Bank's Ease of Doing Business survey. Other popular indicators compare democratic institutions, gender inequality, corruption, contemporary slavery, violent conflict, pollution and more. This proliferation is testament to the power — perceived or actual — of indicators to produce a frame of reference and understanding that Foucault called a "regime of truth" (Hall 1996; Foucault 1980, 131). "By naming an issue, coining a vocabulary for describing it, and creating categories for its assessment, promulgators hope to affect discourse and, ultimately, policy" (Kelley and Simmons 2020). Put another way, the SDGs and other performance indicators constitute discursive practices that provide (and privilege) language and evidence to comprehend and narrativize development (cf. Watts 2003).

Though typically constructed by scientists and experts outside popular democratic venues, these indexes and indicators should not be understood as *apolitical* or purely technocratic. Fischer (2019) identifies three forms of politics undergirding the world of development as measures, metrics and numbers: first, politics "of representation," in struggles over narratives of the history of capitalist development; second, "of prioritization," in construing (often reductively) development as a limited set of discretely measured conditions; and third, "of conception and production," in generating statistics that result from conscious, contestable decisions. In other words, politics suffuse the SDGs process from start to finish, prompting questions: Who and what are counted? By whom, how, when and where? Most of all, why? Here we glimpse the performative character of projects like the SDGs that construct development as that which is assessed, while the details of the assessment configure what is (or can be) developed. As Watts (1993) critically notes, "a part of the armoury of development is… the measures (and the practices of measurement) of development itself."

Development by quantification is hardly a radical break from the past. The collection of statistics on population, economy, environment and society — emergent concerns even in

Malthus' day (Dean 2015) — have long rendered people, activity and geography legible for management. Foucault (1991, 92-93) suggests contemporary government is rooted in "meticulous attention" to a state's population "in their relations, their imbrication with … things which are wealth, resources, means of subsistence, the territory with its specific qualities, climate irrigation, fertility, etc. …customs habits, ways of acting and thinking, etc.… accidents and misfortunes such as famine, epidemics, death, etc." What Foucault called biopolitics would mature amid empire as ruling governments routinely measured, ranked and intervened in the lives of colonized subjects and geographies (Drayton 2000; Tilley 2011; Parenti 2015).[10]

The fetishization of quantification is particularly trenchant in environmental domains, synergizing with neoclassical economics which frames ecological, hydrological and other "natural" processes and systems as potentially quantifiable "stocks," "flows" or "natural capital" (Hébert & Brock 2017; Höhler, S. & Ziegler 2010). Measuring productive natures has also yielded a heterodox literature around "ecosystem services" and their valuation (Costanza et al. 1997; Costanza et al. 2014; Jadhav et al. 2017; Kareiva et al. 2011). In short, measurement, counting and mapping — all of which underpin the SDGs — are political technologies at the heart of governing people, places and "natures" while (re)producing state and non-state power.

Quantification serves as development methodology (Li 2007, 7) through "problematization," or "identifying deficiencies that need to be rectified," and "rendering technical," a range of representational practices for (following Rose 1999) "defining boundaries, rendering that within them visible, assembling information about that which is included and devising techniques to mobilize the forces and entities thus revealed." Problems rendered technical find a ready industry of experts, planners, activists and entrepreneurs; British colonial and postcolonial Indian history offers numerous examples of expert-driven, top-down attempts at with high modern, transformative projects (Bhattacharya 2019; D'Souza 2006; Scott 1998). This production of development problems and solutions — though shot through with latent politics and ideologies — also forecloses democratic or inclusive participation (Li 2007; Sultana 2018). Indicator selection, calculation and measurement is the terrain of scientists and bureaucrats who populate the government ministries and NGOs able to engage elite policy (Sénit 2020). Values and interests are "obscured behind the veil of a technocratic process driven by (supposed) objectivity" (Fukuda-Parr & McNeil 2019, 7) which serves to "cloak normative agendas in languages of neutral and technocratic assessment" (Broome & Quirk 2015, 814). Development discursively and performatively produces "a target for a particular sort of intervention: the technical, apolitical, 'development' intervention" (Ferguson 1994, 28).

India's "Life below Water"

To see this discursive performance, I turn now to India's engagement with the SDGs, and specifically Goal 14, dubbed "Life Below Water" for its concern with the ocean. Technical consultations following Rio+20 yielded an initial "global indicator framework" for 17 SDGs

[10] Foucault labels contemporary population governance as biopolitics, distinct from sovereign rule which emphasizes growing/protecting the specific wealth and authority of the ruler.

adopted by the U.N. General Assembly 2017. That year, the Modi government released its first Voluntary National Review (VNR) report on India's SDG implementation (NITI Aayog 2017). The VNR signaled seemingly enthusiastic engagement with development by measurement, though without effort to plot national data against international indicators.

While official SDG indicators were revised through U.N. processes, India produced and updated its own indexes to track state and national "progress." The political thinktank and pseudo-planning agency NITI Aayog[11] has primary responsibility for aggregating and communicating SDG statistics. NITI Aayog produced the 2017 VNR and published in 2018 a first-pass Indian SDG index (refined in 2019 and again 2021). NITI Aayog's 2018 index excluded metrics on SDG 14 but reproduced boosterish pages on government fisheries policy, port construction and marine protected areas. Subsequent versions presented a handful of SDG 14 indicators, calculated only for India's coastal states. In parallel, the Ministry of Statistics and Programme Implementation (MoSPI) in 2019 generated its own indicator list mapped to SDG targets, and now hosts an online "dashboard" with periodically updated data.[12]A 2020 VNR from NITI Aayog repackaged limited data in graphics alongside narrative text. **Table 4.1** below charts the crystallization of India's SDG 14 index alongside the U.N. indicators as of 2022.

Table 4.1 — SDG 14 metrics in India

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development			
2019 National Indicator Framework, MoSPI	*2019 SDG Index 2.0 by NITI Aayog*	*2021 SDG Index 3.0 by NITI Aayog*	*2022 Official U.N. SDG indicator list*
Target 14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution			
a) Coastal Water Quality Index b) Number of sewage treatment plants installed along the coast and construction of toilets under Swachh Bharat Mission*	a) Percentage increase in use of nitrogen fertilizers in the coastal states b) Coastal Water Quality Index	a) Mean shore zone coastal water quality: Biochemical Oxygen Demand b) Mean shore zone coastal water quality: Total Nitrogen	a) Index of coastal eutrophication b) plastic debris density

[11] The National Institution for Transforming India, known as NITI Aayog, is a recent invention understood to promote/justify the BJP political and economic agenda. Modi created it as a slimmed-down corporate thinktank in 2015 abolishing the vaunted Planning Commission, a top-heavy but influential economic planning agency that dated to early Independence. In neoliberal India, however, central planning and the commission's ponderous Five-Year Plans had become moribund (while also remaining outside Modi's control). Roberts (2021) reviews recent works on NITI Aayog's birth from the ashes of the commission.

[12] The online portal — http://www.sdgindia2030.mospi.gov.in/dashboard/ — is managed by a private Big Data company, iTech Mission, whose slogan "for a better world" emphasizes how data sit at the heart of development.

c) Percentage change in use of nitrogen fertilizers in the coastal States			
Target 14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans			
a) Percentage change in area under mangroves b) Implementation of Coastal Zone Regulation Notification of 2011* c) Percentage change in Marine Protected Areas*	Percentage increase in area under mangroves	Percentage increase in area under mangroves	Number of countries using ecosystem-based approaches to managing marine areas
Target 14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels			
Coral health index of Exclusive Economic Zone*	Average marine acidity (pH) measured at representative sampling stations in the shore zone	Average marine acidity (pH) measured at Representative sampling stations in the shore zone	Average marine acidity (pH) measured at agreed suite of representative sampling stations
Target 14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics			
Maximum Sustainable Yield (MSY) in fishing	No indicator	No indicator	Proportion of fish stocks within biologically sustainable levels
Target 14.5 By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information			
a) Coverage of protected areas in relation to marine areas* b) Percentage change in area under mangroves	No indicator	No indicator	Coverage of protected areas in relation to marine areas

Target 14.6 By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation			
No indicator	No indicator	No indicator	Degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing
Target 14.7 By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism			
No indicator	Percentage of available potential area developed under coastal aquaculture	Percentage of available potential area developed under aquaculture	Sustainable fisheries as a proportion of GDP in small island developing States, least developed countries and all countries
Target 14.a Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries			
Allocation of budget resources for research as per the EEZ or coastal line*	No indicator	No indicator	Proportion of total research budget allocated to research in the field of marine technology
Target 14.b Provide access for small-scale artisanal fishers to marine resources and markets			
Assistance to the traditional / artisanal fishers for procurement of FRP boats and other associated fishing implements	No indicator	No indicator	Degree of application of a legal/regulatory/ policy/institutional framework which recognizes and protects access

			rights for small-scale fisheries
Target 14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of "The future we want"			
Percentage compliance of international laws*	No indicator	No indicator	Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean-related instruments that implement international law, as reflected in the United Nations Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources

*proposed indicator, data under compilation

I do not wish to exhaustively dissect goals/targets/indicators or suggest alternative specifications.[13] Instead, this chapter aims to problematize development by quantification and demonstrate how slippery conceptions of sustainable development — ostensibly measured by the SDGs — enable India's articulation of muscular nationalism to neoliberal capitalism in the name of Blue Economy. While more radical or critical metrics could make SDG measurement more self-reflexive or better capture unsustainability, perfection of quantification would not automatically (or even likely) challenge the SDGs' discursive and performative power. In this analysis, four key points arise.

First, many U.N. indicators have no national corollary. This *persistent incompleteness* is not surprising as national (and subnational) monitoring and evaluation have long been targeted for "capacity building."[14] Yet India is not "data-poor"[15] and has numerous government bureaucracies devoted to statistical collection and analysis, including NITI

[13] Nor do I wish to dwell on basic mathematical problems known to even undergraduate students of statistics (e.g. the pitfalls of calculating percentage change on short-term basis).
[14] SDG17 itself calls for a national "statistical capacity indicator for Sustainable Development Goal monitoring."
[15] This commonplace descriptor repeats a political ideological of poverty (Fischer 2019) in the ethereal realm of data.

Aayog and MoSPI; Modi himself encourages his subordinates to govern via data (Arnimesh 2021). India's omissions of indicators raise a question: Does the government actually desire transparent evaluations? Selective reporting or withholding information controls development narratives and minimizes accountability, as "no data" supports abstract claims about sustainability better than explicit evidence of unsustainability. "Data opacity and a lack of accountability have been the two glaring leitmotifs of the statistical ecosystem" during Modi's tenure, producing just "enough smoke so that a discussion as fundamental and important as poverty levels remains ensnared in confusion" (Shroff 2022).

Second, variable/indicator choices reflect the SDGs' tendency toward *synoptic reduction* of multi-layered systems or complex phenomena to supposedly straightforward statistics (cf. Scott 1998). Take the example of SDG Target 14.4, which envisions future sustainability in fishing, defined as harvest regulation and scientific management to end "overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans." In India, this goal would require command and control of diverse, multi-scalar marine fisheries,[16] composed of dozens of overlapping stocks, hundreds of catch landing centers, thousands of fishing villages, tens of thousands of fishing craft, hundreds of thousands of active fishers and millions of fisher household members (Jadhav 2018). The SDGs reduce "sustainability" of this complex assemblage to a single official U.N. indicator: the "proportion of fish stocks within biologically sustainable levels." This measurement would calculate annual harvests relative to a fisheries concept known as Maximum Sustainable Yield (MSY), a quantitative estimate of fish that can be harvested without threatening the reproduction of the remaining population. Multiple mathematical methods have been tested for assessing theoretical MSY, but all calculations rely on estimation, extrapolation and abstraction from other proxy/sampled data, each with their own conceptual problems and margins of error (cf. Vase et al. 2019). Errors compound when aggregated to the millions of square kilometers of that make up India's EEZ, making national MSY impossibly abstract and fictionally precise; put another way, MSY may be only myth that reproduces fantasies of scientific management (Ramesh and Namboothri 2018). Fish populations and their growth rates fluctuate wildly with myriad factors ranging from climate and ecology (e.g. nutrients, water quality, upwelling strength or ocean temperatures which condition survival rates) to social and techno-economic considerations (net mesh sizes, spatial distribution of effort or seasonal fishing intensity). Even crude MSY calculations for many species in India remain in progress, and government agencies lack the monitoring or enforcement capacity (scientifically, politically or practically) to constrain harvests any given level, sustainable or otherwise.[17] One internationally published estimate suggests that out of 223 identified stocks in Indian waters, only 34 percent are not currently threatened by present fishing effort while also

[16] Except where explicitly mentioned, this chapter concerns fisheries carried out at sea or in coastal estuaries and backwaters. India also has considerable, vibrant inland fisheries in rivers, ponds and ancient human-made tanks.

[17] In India, fishing regulations are often shifting, contradictory and contested. Arguably, the most successful regulation — a seasonal ban on large-scale fishing during the monsoon season (Gunakar, Jadhav and Bhatta 2017) — is more a politically accepted annual brake on fishing intensity than rule designed from scientific certainty.

still having a population capable in the abstract of sustaining the fishery (Sathianandan et al. 2021).

In place of MSY relative to harvest (again, a mainstream if contestable metric), MoSPI's online SDG dashboard reduces fishing sustainability to a static figure — 5.3 million metric tons of "potential yield" from the EEZ.[18] Produced by a government committee in 2018, this number is significantly higher than previous estimates, which held Indian marine fisheries capable of sustaining between 3.7 million and 3.9 million metric tons of annual harvest (Desai, Bhargava & Sarupria 1990; Srinath & Balan 2003). Even these estimates were higher than the average marine catch over the last decade and a half, stagnant at about 3.3 million metric tons (Lakra and Gopalakrishnan 2021). The drastic increase by the 2018 committee of "potential yield" could reflect higher resolution assessment of individual fish stocks, though the needed science — detailed for individual species/stocks by region — has not been published on such a grand scale. Meanwhile, the absence of publicly available documentation from the committee or its deliberations (in digital science repositories, for example) raises the possibility of political influence to ensure current levels of fish harvest and expansionary development ambitions appear within supposed limits. Critical scholars and fishers themselves for years have suggested that India's marine fisheries are actually under severe stress (Bhathal & Pauly 2008, interviews 2012, 2014, 2015, 2016).

Third, India's chosen indicators reflect *geographic confusions* that follow from the SDGs' reliance on measurement within demarcated spaces (idealized boundaries within which development operates). Reporting of aggregate statistics within a given space obscures nuance and variation within that geography, potentially hiding unsustainability at smaller scales. For example, India uses remotely sensed mangrove forest canopy to proxy coastal ecosystem health (Targets 14.2 and 14.5).[19] Yet celebrating aggregate canopy increase conceals rampant clear-cutting and in-filling of mangrove wetlands for industrial and real estate projects (Ghosh et al. 2015; Sud 2021; Vijay et al 2005). Also problematic is the presentation of coastal statistics while ignoring marine impacts of terrestrial ecologies and economies far upstream. Consider that in the absence of more robust water quality measurement, MoSPI suggests that the number of toilets and sewage treatment plants built in coastal states could serve as indirect proxy to assess marine pollution. Problematic conflations aside — neither toilets nor treatment plants automatically prevent sewage release[20] — this choice of metric also presumes that oceanic water quality is only a coastal responsibility and discounts pollution across India that still ultimately washes out to sea. Conceptualizing oceanic and coastal sustainability as domains disconnected from inland activity problematically overlooks both hydrological and sociohistorical relations in India between the ocean's waves, current, winds and climatology, and a landed territory soaked in snowmelt, monsoon rainfall and flowing rivers (cf. Amrith 2018).

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[18] Notably, NITI Aayog indexes sidestep Target 14.4 entirely.

[19] Mangrove forests serve as global charismatic megaflora and their protection arguably is understood as a near-universal conservation target globally (cf. Spalding and Leal 2021).

[20] These statistics also repeat fetishization of the toilet by development policy generally (cf. Menga and Goodman 2022) and the Modi government specifically.

These twinned geographic confusions or insensitivities —obscuring intra-scalar variation and ignoring inter-scalar relationships — demonstrate a non-relational approach to development and sustainability. Put another way, this performance of the SDGs fails to account for development as an uneven geographic process both horizontally (interrelation across space) and vertically (interplay of scales within space). This understanding of development also draws on and reinforces methodological nationalism. Sexsmith and McMichael (2015) note that the SDG process reifies a "state-centric framework for global development planning" inadequate to diagnosing unsustainable development when the root causes or motive forces transgress administrative and political boundaries (e.g. fish that swim, mobile capital, far-away consumer demand, pollution that always flows downstream or globalized climate change).

Fourth, SDG targets and indicators remain *ambiguous and flexible*, available for (re)interpretation by dominant politics. To start, note the recursive, near-tautology in SDG 14 as a whole: States are to "sustainably use" marine environments and resources for "sustainable development." Some individual targets also reference sustainability without definition, further transmuting the concept into open-ended jargon, buzzword or even floating/empty signifier (cf. Brown 2016). While I would critique attempts to precisely delimit sustainability indicators across divergent geographies, as they stand, the SDGs allow flexible (re)definition expedient for ruling political economic interests — e.g. India's Blue Economy agenda. India's indicator selection for Target 14.7 provides the object lesson, conflating aquaculture expansion with "the sustainable use of marine resources" (Target 14.7). Across the country, farming marine products is hailed today as a new "blue revolution," underscoring a fantastic imaginary of the Blue Economy while presaging a transformation of agrarian life and economy that echoes the Green Revolution (Newman 1981; Patel 2013). Though coastal communities have long practiced aquaculture-like rearing of trapped fish in combination with rice paddy that tolerates brackish water, low-input local traditions have increasingly been subordinated to industrial, commodity fish farming. Social-ecological effects are manifold: commons dispossessed, waterways fouled with pollution, wild stocks diverted into feed for farmed fish, and conflicts between local communities and would-be capitalist or "mafia" elements over wetland destruction (Ali et al. 2021; Bhat and Bhatta 2004; Bhatta 2019; Bhatta & Bhat 1998; Kanan et al. 2020; Roy 2019). Yet aquaculture serves as a key plank in the national Blue Economy project's dreams of limitless production, especially of prawns, cobia, pompano and other export species (Ranjan et al. 2017). Against this political economic backdrop — Modi (2021) himself touts the future of aquaculture — the SDGs appear more a project of incentivizing and justifying capitalist (and in this case specifically nationalist) expansion than of tracking sustainability.

Taken together, these four features of India's SDG efforts — persistent incompleteness; synoptic reduction of complexity to statistics; multiple geographic confusions; and an ambiguous and flexible character — author and authorize a notion of sustainable development that is uncritical, abstracted and blurred in meaning. Put another way, the performance of development by measurement has produced sustainability as a mutable signifier available for articulation to/within broader political and political economic projects. In India, this reconfigured discourse of sustainability has become hitched to and

submerged within Hindutva's vision of oceanic capitalism, at once nationalist and neoliberal.

Against this fantasy-laden discursive production of sustainable seas and coasts, I turn now to the concrete experience of lightly developed estuary in southwestern India where the Blue Economy agenda is hard at work.

Actually existing (un)sustainability of the Blue Economy

The sheltered backwaters of the Aghanashini River present a contrasting image to the frenetic, glitzy, ultra-modern megacities and urbanizing industry of New India's policy imaginaries and development praxis. There are no heavy industries, high-rise buildings or planned subdivisions. Instead, several thousand households live scattered in small hamlets around this estuary nestled on northern Karnataka's rural coastline. (see **Figure 4.1**). Such is the contemporary biodiversity and ecological health of "lightly touched" estuary (Bhat et al. 2014; Jadhav et al. 2017) that scientists, activists, residents and even a collective of fishers have formally and informally proposed its designation as a protected area (Chandran et al. 2012; Hegde 2014, interviews 2015, 2016). The red clay tile roofs of traditional bungalows and brightly colored box construction of newer homes contrast with tropical greenery. Mangroves sprawl in swamps and line the embankments along fields and ponds. Coconut and areca palms tower over homesteads and gardens. Fish, shrimp, crabs, oysters, clams and mussels are seasonably in abundance and petty producers also extract salt, sand, shell and leaflitter from the river. Small-scale and subsistence fishers ply shallowest reaches of the estuary while small-but-ocean-going trawl and purse seine boats shelter at jetties along the deeper riparian channel (see **Figures 4.2** to **4.4)**. Paddy rice grows in submerged fields that are also, sometimes, used for traditional fish trapping and ranching. Cashew, mango and a dozen other tree species produce fruit and fodder on higher ground away from the brackish water table. Notably, many households straddle subsistence and commercial production, producing one crop to sell (e.g. peanuts) while reserving another for the dinner table (e.g. rice). Survey data suggests most households avoid dire poverty by combining diverse income sources with self-provisioning from livestock, gardens or the commons.[21]

[21] These depictions of life, livelihoods and politics in and around the Aghanashini Estuary are drawn from more than 18 months of research and activism in academic, NGO and government projects. This work included hundreds of interviews, two large-*n* household surveys conducted by a team and practical community development programs.



Figure 4.1 *— The Aghanashini River estuary, situated in Karnataka on India's southwestern coast (adapted from Jadhav et al. 2017)*



Figure 4.2 *— Oyster harvesters at extreme low tide. Author photograph.*



Figure 4.3 *— The Aghanashini main channel (left) bordered by ponds for fish trapping and aquaculture (right). Author photograph.*



Figure 4.4 *— An Aghanashini bag net fisher. Author photograph.*

However, this (wet)landscape should not be imagined as a rural idyll locked in a vestigial past disconnected from India's postcolonial "modernity." Lengthy supply chains insert peasant producers and harvesters into regional and national political economies. Farm consolidation, plantations and aquaculture signal increasing commodity production that

drives class stratification and swells the ranks of landless labor. Small-scale fishers also increasingly beach their own boats to crew ocean-going vessels locally or seasonally in distant, city harbors. Caste, class, gender and religion all further configure socioecological relations and "development." In short, I suggest the Aghanashini estuary constitutes an exemplary (as opposed to exceptional) coastal political ecology (Bennett 2019; Jadhav 2015), one that sits at the intersection of multiple Blue Economy (un)sustainabilities. In this section, I highlight four "developments" looming around the estuary: a state-capital partnership to construct a shipping port, speculative investments in aquaculture, takeovers of space by coastal tourism and an aggressive mangrove afforestation campaign.

Port development

For decades, development planners have overlooked socioecological complexity, focusing instead on the river's narrow mouth, guarded by rocky headlands, which shelters the estuary from ocean waves and winds. Industrial boosters have long envisioned this "safe harbor" as an ideal site for economy by the sea. In the 1970s, the state government seized more than 1,400 acres of wetlands to build a caustic soda plant utilizing abundant clam, oyster and mussel shell discards. Nehruvian state-led developmentalism of the day would also reinforce dike walls along the river and pave roadways — ostensibly to secure agricultural production and expand marketing. The factory failed so quickly that many estuary residents have no memory of its operation (interviews 2015, 2016); the only remainders of that dream are weathered pylons jutting from the water. Other designs for the acquired land —a coal-fired power plant, a Special Economic Zone, various harbor configurations, even a ship-breaking yard — have repeated stalled in the face of local backlash (Arun and Habbu 2010; Kohli and Sekhsaria 2000; Menon 2004; Menon and Kohli 2015). Some dispossessed residents have sued in court for additional compensation, and the failure to bring promised development hangs over local politics. In the late 2000s, the Karnataka State Industrial and Infrastructure Development Corporation (KSIIDC) began planning the latest iteration of an industrial shipping port, one with "total automation and 24x7 operations," to export coal and import steel (NEERI 2015). Feasibility reports, cost-benefit analyses and speculative plans are shot-through with boosterism, wishful assumptions and bad math. Dreaming of "public-private partnership," officials would hand the estuary over to a yet unnamed private corporation to build and operate the port for an unfixed term before ultimately ceding the development back to state control.

Completion would take decades and require the sacrifice of at least 500 acres of mangroves — protected habitat under Indian law — as well as fishing grounds, oyster beds and mudflat ecologies. The estuary, currently only a few feet deep in many locations, would also be dredged down to at least 16 meters to accommodate industrial-scale traffic, shuttering commercial fishing jetties and banishing small-scale fishers from the river. Residents, ecologists and environmental activists note that tides would spread pollution and debris far away from the port itself, despoiling many more acres of mangroves, cultivation ponds, decades-old salt pans, oyster beds fish nurseries and beaches (interviews 2015, 2016). Additional land use change would likely follow knock-on industrialization in the region. At risk, according to even coarse estimates, are hundreds of millions of dollars annually in "ecosystem goods and services" (Jadhav et al. 2017).

Though the port proposal predates Modi's rule, boosters pitched the project for inclusion in the BJP's flagship Blue Economy programme, Sagarmala ("ocean necklace" in Hindi). Under this scheme, the Ministry of Ports, Shipping and Waterways envisions cargo facilities, highway connections, rail lines, relocated fishing harbors and other "modernized" maritime infrastructure as a garland draped over the neckline of the Indian peninsula.[22] This agenda doubles down on India's neoliberal export economy dreams,[23] and the government claims to have completed or started projects worth $77.5 billion (more than 600,000 crore rupees).[24] Not included in that figure is the $556 million (4,300 crore rupees) price tag of the new port imagined for the Aghanashini estuary. And though Modi (2016) touts port development as a return to India's "glorious maritime heritage," the uneven distribution of environmental, social and economic impacts of oceanic capitalism and infrastructure continues to produce opposition across the country (Research Collective 2018; Rodriguez and Sridhar 2010).

In the Aghanashini case, some residents from communities who lost land decades ago have backed the port project; at a project hearing in March 2015, a contingent of supporters heckled all opposition — a loose coalition of residents, fishers, activists, NGOs and scientists who decry the port's outlandish claims of sustainability. A government review committee ultimately recommended environmental clearance only if planners could satisfy two dozen riders related to environmental management, worker safety, impact monitoring and pollution mitigation (MoEFCC 2017). The central government Ministry of Environment, Forests and Climate Change has since withheld a final decision on permits, and activists reported in 2018 that the project was unofficially, quietly cancelled.[25] However, proponents and critics alike say they expect the government to continue pitching industrial development as long as it continues to hold the acquired wetlands (interviews, 2016, 2018, 2020).[26]

Aquaculture expansion

The port project is only one example of the multivalent Blue Economy. For years development institutions in India have dreamt of aquaculture as an alternative to stagnating capture fisheries (Krishnan and Birthal 2002). Oceanic harvests face fundamental (and fluctuating) ecological limits and declining returns to fishing effort, but aquaculture represents, for state scientist and capitalist investor alike, the dream of expanded fish production through agro-industrial methods: private property regimes,

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[22] The name conspicuously also reflects a Hindu-ization of national development policy; the *mala* features in Hindu rites and rituals (e.g. wedding garlands) as well as individual religious practice.

[23] More than a decade ago the Congress Party-controlled central government announced a "maritime agenda" called for some $41 billion (by today's exchange rates) of port infrastructure by 2020 along with a 54-point ocean commerce development plan (Ministry of Shipping 2011).

[24] Karnataka alone is slated for "development" worth almost $2 billion (more than 15,000 crore rupees), including upgrades and expansions at existing ports in Karwar and Mangalore, as well as a coastal petrochemical facility. Figures computed using May 2022 exchange rates (Ministry of Ports, Shipping and Waterways 2022).

[25] The port still features prominently on the KSIIDC official website. http://www.ksiidc.com/tadadi_port.html Accessed September 2022.

[26] The repeated political/economic reanimation of megaprojects in the acquired wetlands land presents a case of actually existing zombie neoliberalism (Peck 2010).

financing tied to land, consolidation of small holder wetland tenures, new commodity chains of inputs/equipment, scientific management, vastly scaled-up production and foreign exchange from fish export. A cadre of development and science agencies — the Coastal Aquaculture Authority (CAA), National Fisheries Development Board, Central Institute of Brackishwater Aquaculture, National Centre for Sustainable Aquaculture and Central Marine Fisheries Research Institute, to name a few — run training, incentive, demonstration or subsidy schemes to industrialize the once-nascent sector. The result has been an almost 900-percent increase from 1988 to 2013 (Jayanthi, Thirumurthy & Ravichandran 2018) in the area under coastal aquaculture (notably, a statistic conflated with sustainability in the SDG process).

Modi's government will continue the trend; the central government in 2020 announced a five-year plan to boost annual fish production by seven million tonnes and double marine product exports. This neoliberal leap in output will require the spatial expansion of fishing into the farthest reaches and depths of the EEZ, and the continued transition to a capitalist, debt-financed industrial fishing fleet that exploits smaller-scale fisher labor and depletes the marine commons (Jadhav 2020). According to Modi, the government wants fisher to take loans "so they can buy bigger boats" (ANI 2017). However, with annual marine fish harvest stagnant at roughly 3.3 million tonnes, this fantasy of fisheries growth will depend more crucially on the intensification/expansion of aquaculture. In this development dream, India's millions of acres of backwaters, wetlands and rivers must be repurposed and exploited, despite devastating consequences for water quality, wetland commons, biodiversity and social economy. At the same time, wild caught fish — consumed daily in coastal households — are discursively and materially reimagined as feedstock for fish farming.

In the Aghanashini, aquaculture represents both imminent future and echo of the past. Decades ago, the mosaic of small fields surrounding the estuary supported a traditional land-use system known as *gajni,* combining salt-tolerant *kagga* rice, shrimp culture and sometimes fish trapping (Bhatta 2019; Jadhav et al. 2017; Stone et al. 2008). Much of this land locally was consolidated and converted to full-time aquaculture during a shrimp boom in the 1990s. The bust that followed — in part because disease and pollution killed off stocks — left much gajni land too degraded, deep or large for traditional methods. These fallow ponds are now again fluid terrain for experiment and speculation. In recent years, multiple aquaculture ventures have appeared, often shrouded in quasi-secrecy. One facility with pipes running directly into the ocean hides behind large walls, while security guards at another site along the river's edge prohibit visitors from approaching. One entrepreneur from Bangalore, however, was both candid and condescending about the opportunity to (re)organize coastal space and livelihoods: "These people, they can't do anything like this," he said, gesturing to floating fish cages in ponds adjacent to the river. "They need to be taught. If you don't teach them, they'll spend their money on alcohol. I can come here and bring some economic development, and of course everyone can get rich" (interviews 2015).

Coastal tourism

The Blue Economy dream of reconfiguring coastal natures and livelihoods into revenue also motivates hype surrounding eco-tourism — short for ecological tourism. Dreaming of

profitable conservation, promoters seek guests willing to pay premiums to experience natural spectacle — from the mangrove swamp to the sun-soaked beach. The Blue Economy's performative mantle of sustainability, as with industrial shipping and aquaculture, provides cover for many forms of development, from high-end resorts to low-budget backpacker beach shacks. Modi himself in a visit to Kerala in 2021 inaugurated a new large-scale cruise ship terminal while simultaneously hailing the sector as space for entrepreneurs and speculators: "I urge our young start-up friends to think about innovative tourism-related products" (ANI 2021a). However, packaging remnant "wilderness" for wealthy visitors often consumes or encloses local environments while fueling inequality and social conflicts (Fletcher 2014); put another way, nature tourism trends toward "exporting paradise" (Clancy 2001; Hampton 2013).

As with other Blue Economy ambitions, this vision of tourism is hardly novel. Decades ago, India's small state of Goa helped pioneer the marketing of the sensual sea: sumptuous meals, fresh-caught fish, stunning sunsets, sandy expanses, bathtub-warm waters, beach parties, flowing alcohol, sex, drugs and rock and roll. The 1960s scene catering to "Western hippy travelers" has morphed, through a mix of entrepreneurial capital, speculative real estate markets and state intervention, into an industry of guest houses, hotels, entertainment and transport services (Routledge 2000; Wilson 1997). Tax and foreign exchange receipts have boomed but at a cost: overburdened infrastructure, pollution, drug/sex trades and social conflicts (Lakshmi 2013; Menezes 2014). Tourism's takeover of the state's beaches and coastal towns has also coincided with the displacement of small-scale fishers and the growth of a mechanized, commercial fleet (Newman 1981; Jadhav 2018).[27] Goa's story also increasingly repeats along much of India's coastline, from houseboat tours in Kerala to scuba resorts in the Andaman Islands to innumerable ventures capitalizing on coastal forts, golden sands or charismatic wildlife (Equations 2019; interviews 2015, 2016).

This transformation has also begun around the Aghanashini, where just two decades ago the tourism economy concentrated on Hindu pilgrims visiting a fourth-century temple complex in Gokarna. Today, a new generation of resorts, cottages and beach shacks has proliferated along beachfronts north and south of the river mouth, offering a vibe akin to Goa's earlier days. Overnight rail and bus services connect the rural coast to major cities, especially Bangalore. Some fishers now take guests aboard boats for dolphin-spotting or cruises upriver through mangroves. New adventure companies, Airbnb hosts and NGOs market varying visions of eco-tourism around the estuary and in the nearby Western Ghat mountains.[28]As of June 2022, KSIIDC, the state industrial development agency behind the seemingly stalled port project, has begun pitching the development of an "eco-tourism hub" to attract private developers to the land appropriated decades ago by the government.

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[27] This transition to mechanized fishing is a national trend that will only intensify under Modi's Blue Economy (ANI 2021b).

[28] The NGO Panchabhuta Conservation Foundation (PCF) has promoted eco-tourism experiments such as a farm-to-table restaurant and homestays. PCF provided institutional support and assistants for this research in 2015 and 2016.

Downsides have been predictable: pollution, clashes over social taboos (e.g. beach attire, parties, public drinking, drugs) and enclosures of the commons. Consider an incident when many fears became manifest: In the 2016 dry season, tourists exploring the ruins of a stone fort overlooking the ocean sparked a fire that burned through acres of grassland commons used by a nearby village for cattle fodder. Like elsewhere in India (Sud 2021), a hyper speculative real estate markets also increases pressure to sell to developers, further commodifying land or incentivizing outright enclosure (interviews 2016). Meanwhile, residents say the eco-tourism's primary beneficiaries are elites who command labor, capital and micropolitical power. One member of the local elected council, the *panchayat*, provides an example. Congenial, eager and broadly interested in local "development," he has secured rights to harvesting cashews from a state plantation while acting as a gatekeeper and intermediary for NGO projects (interviews 2015, 2016). Most recently he has parlayed his clout and coastal land ownership into partnership in an Airbnb-operated small-scale resort, which has since expanded onto beach.[29]

Mangrove plantation

As industrial projects repeatedly failed, portions of the estuary seized by the state reverted to a fishing commons. In the mid-2000s, these wetlands were targeted for a different mode of development: conservation. The state Forest Department, local environmental NGOs and community activists began aggressively planting the "unused" government "land" with mangrove saplings, and a kind of mangrove monocropping has since spread into the same development dreamscape of ports, eco-tourism and aquaculture. This "successful" afforestation of mangroves and the preservation of biodiversity (Kumar & Singh 2022; Mesta 2014;) exemplifies a contradiction of the Blue Economy agenda. As charismatic megaflora, mangroves are legible to planners and policy makers as highly productive wetlands, generating multiple ecosystem goods and services. They receive strict *de jure* protection under state coastal regulations and forest laws, though *de facto* enforcement remains uneven (Jadhav et al. 2017; Kohli & Menon 2019). Increased mangrove cover — a remotely-sensed indicator in India's SDG assessment — remains integral to claims that the Blue Economy agenda is or can be sustainable. In short, mangrove plantation around the Aghanashini is framed in the abstract as a conservation "win."

Yet Blue Economy developments today threaten mangroves and their social ecologies. The industrial port would explicitly despoil old and new mangrove cover in the estuary. Aquaculture, too, threatens mangrove swamps, even as it depends indirectly on their existence as breeding grounds for future wild feedstock. Unregulated or aggressively developed tourism also poses dangers to mangrove swamps — directly from the inevitable damage caused by boat excursions and indirectly through the increased pollution (to say nothing of the social inequalities likely to arise). Yet these specific actually existing *unsustainabilities* are routinely dismissed summarily in planning documents or otherwise reframed by policymakers and elites as a necessary cost of the dream national development. Indeed, the success of mangrove afforestation in the estuary paradoxically smooths this process as planners then argue that new mangroves can be replanted elsewhere (NEERI 2015, interviews 2015, 2016).

[29] This micropolitical powerbroker has been a general supporter of and occasional collaborator with PCF.

These and other transformations, dispossessions and sacrifices at sea and along the coast are nonetheless increasingly fantasized as sustainable development through recourse to India's Blue Economy agenda (Ali et al. 2021 Kanan et al. 2020; Research Collective 2018). The case of the Aghanashini demonstrates what can happen when an uncritical vision of sustainability — performed through the SDG process — provides justification for the construction of a shipping port, the expansion of aquaculture, the creep of eco-tourism or even the sacrifice of mangroves habitats. In sum, what India's Blue Economy dream portends is a drastic reworking of social and ecological space that would upend livelihoods, lifestyles and natures for the twinned goals of nationalist development and neoliberal profit.

Conclusion: Oceanic neoimperialism?

This paper began with the observation that the Blue Economy agenda drowns out many critical questions about sustainability — ecological, social and economic. To understand how this came to be, I first historicized the concept of sustainable development and its contemporary (fetishized) praxis of quantification and measurement. Development today operates within a discursive regime of so-called "global performance indicators," of which the SDGs are just one exemplar. India's cranking of the gears of SDG assessment remains incomplete, reductive, geographically confused and ambiguous, which authors and authorizes an abstracted, mutable vision of sustainable development. Emptied of critical content, sustainability becomes a signifier available for ambitions of capitalism in and around the sea. Contra this performance of sustainability, I have also highlighted a case of the actually existing Blue Economy in southwestern India that foretells drastic transformations: the construction of shipping ports, expansion of fisheries and aquaculture, marketing/packaging of space for tourists and the conservation/destruction/replantation of mangroves. In short, the subsumption of sustainability within Blue Economy dreams (re)produces watery ecologies and coastal places as new sources of (neoliberal) capital, profit and employment for the nation.

I also argue that within the broader politics of Hindutva and the dominant BJP, the Blue Economy has still more work to do. Consider the 2020 comments of Amitabh Kant, the then-chief executive of NITI Aayog, lamenting India's political landscape as a basic constraint on capitalism. During an online event organized by rightwing magazine *Swarajya* (and sponsored by mining giant Vedanta), Kant praised the Modi's "political determination and administrative will," because "tough reforms are very difficult in the Indian context. We are too much of a democracy. For the first time the government has had the courage and the determination to carry out very hard-headed reforms across sectors." Kant's words could be dismissed as clumsy bureaucratic prattle, but his thinktank produces India's development policy and oversees SDG assessment. Though he retired in 2022, Kant is a policy wonk, friend of corporate India and Modi acolyte (Chatterji 2021). Any vision of development expounded by Kant — including one that is skeptical of democratic governance — cannot be easily distinguished from BJP rule.

Neither Kant's endorsement of strong-armed "reform" (Narrain 2021; Roy 2021) nor his implication that democracy is an obstruction to development produced much public

controversy. Afterall, Kant had only voiced an already open secret: India is in the grips of a decades-long slide away from its postcolonial democratic ambitions toward the authoritarian, ethnonationalist rule of Hindutva. This project of hegemony aggressively reimagines the space, norms, beneficiaries and constituents of the nation as Hindu-first, supplanting a multicultural, secular constitutional liberalism (Bardhan 2022; Jaffrelot 2021; Vanaik 1997; 2001, 2018). Simply put, India is witnessing the rise of a neoliberal-neofascist combine, one that I suggest has decidedly *neoimperial* pretensions and proportions.

Under the sign of the Blue Economy, oceanic and coastal spaces (and the life, livelihoods and relations therein) are reconfigured, repossessed or repurposed for national "improvement" — with all the coloniality that term implies (Drayton 2000; Li 2007). Simultaneously, the improved nation is redefined as capitalist, sustainable and modern, while still the bearer of an ancient Hindu lineage and a "glorious maritime heritage" (Modi 2016). The capitalist, Hindu nation centers the mostly Hindi-speaking heartland and subordinates peripheral people and places (coastal communities and traditional fisheries, but also Dalits and Muslims nationally). This also reinscribes the historical marginalization of Indian coasts and seas (cf. Subramanian 2009) producing them as available for sacrifice (and possible reincarnation). Ultimately, these reconfigurations — both material and discursive — serve as the foundation for the further accumulation of capital, the expansion of Hindutva hegemony and the (imperial) assertion of power into/across ocean space. Imagining India standing astride "the crossroads of Indian Ocean," Modi himself declares, "We must also assume our responsibility to shape its future." Put another way, when India's leaders dream of an expanding, purportedly sustainable Blue Economy, they simultaneously dream of empire.

Chapter 5 | Revisiting ecosystem services: Assessment and valuation as starting points for environmental politics[1]

Introduction

For decades, trends in forest cover loss, land use change, marine ecosystem degradation and declining environmental health, particularly in the Global South, have rung alarm bells (Hansen et al. 2013; Halpern et al. 2008; Lambin and Meyfroidt 2011). While questions about material human impacts on the earth are certainly not new (Thomas 1956), scholars and policy makers increasingly recognize the scale of anthropogenic forces not only as isolated or regional (Jha, Dutt and Bawa 2000) but also international (Foley et al. 2005). These analyses have also been aided by the increased power of remote sensing technology and publicly available satellite imagery. Concurrently, discussion, debate and diagnosis of ecological change or degradation has been read through a framework highlighting "nature" as a provider of a plethora of valuable (even invaluable) ecosystem goods and services (hereafter referred to as ES) vital to human (and non-human) wellbeing. A typology of ES and new methods for categorization and measurement have developed particularly following influential publications in late 1990s and 2000s (Costanza et al. 1997; Daily 1997; MEA 2005)[2].

Today, the ES paradigm features prominently in policy, theoretical and activist discussions around environmental protection and critiques of development (Braat and de Groot 2012; Kumar and Martinez-Alier 2011), such that the ES concept may constitute a "boundary object" that readily bridges divides between policymakers, scholarly disciplines and laypeople (Abson et al. 2014; Schröter et al. 2014). Economic valuations of ES — often relying on neoclassical economics and natural resource accounting methods — have grown increasingly detailed while also gaining political and policy purchase. In particular, the Economics of Ecosystems and Biodiversity (TEEB 2010) initiative, hosted by the United Nations Environment Programme, has helped "the real value of natural capital, and the flows of services it provides, to become visible and be mainstreamed in decision making." Scholars have also produced global-scale economic valuations of ES in recognition of the real loss to landscapes, biodiversity, ecology and "natural capital" (Costanza et al. 2014; de Groot et al. 2012; Barbier et al. 2011). For example, in a widely cited 2014 estimate — which informs this paper's analysis — a team of scholars approximated that loss in annual global ES from 1997 to 2011 could be as much as $20 trillion (Costanza et al. 2014). More recently, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) — an advising and assessment body established by national governments with functions akin to the Intergovernmental Panel on Climate Change — has included

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[1] A version of this chapter was previously published in September 2017 — co-authored with Sharolyn Anderson, Michael Dyer and Paul Sutton — with the following citation: Jadhav, A., Anderson, S., Dyer, M.J.B. and Sutton, P. (2017) 'Revisiting ecosystem services: assessment and valuation as starting points for environmental politics', *Sustainability*, 9(10). Available at: https://doi.org/10.3390/su9101755. Co-authors have given their permission. I served as corresponding author and conceived and designed the study with Anderson and Sutton. I oversaw field research components and assisted Anderson, Sutton and Dyer in image analysis. All authors contributed to the discussion and writing in various amounts.

ecosystem goods and services within a conceptual framework of nature (human and non-human), drivers of ecosystem change, institutions, governance and well-being (human and non-human) (Díaz Demissew, S., Carabias, et al. 2015; Díaz Demissew, S., Joly et al. 2015). While the IPBES framework acknowledges multiple perspectives for understanding human and non-human natures, it also cements the ES paradigm as a key analytic.

Though a prominent frame in the policy-science interface, ES and ES valuation is not without controversy. Critics have argued that explicitly valuing "nature" may pave the way to pricing, marketing and commodification of environmental public goods (Heynen and Robbins 2005; Gómez-Baggethun and Ruiz-Pérez 2011); furthermore, some critics charge that the process is rooted in a kind of environmental pragmatism that gives too much ground to economists (Spash 2009) while overlooking methodological problems of measurement and imprecise valuation (Neimeyer and Spash 2001; Vatn 2000). Benefit transfer, the method used in major global studies as well as this paper, has been critiqued for its limits — particularly its imprecision (Spash and Vatn 2006). In addition, measuring the value of natural goods and functions has not always lead to smooth and clear policy mechanisms (Das 2010) and even proponents of ES assessment and valuation admit that policy implementation or integration of ES into landscape planning remains a challenge (de Groot et al. 2010). Meanwhile, interpretation of remote sensing data — typically classification of land-cover uses or types — has also been criticized as both diverging from local opinions and having the potential to reduce or "fix" dynamic landscapes through reductionist characterizations (Robbins 2001).

We do not reference these critiques to either categorically defend or condemn ES; neither is this our intent, though we note that ES scholars themselves have responded to critics on various charges (Schröter et al. 2014). Consideration of the various values derived from ecosystems by humans and non-humans within them (see typology in Hejnowicz and Rudd 2017) makes clear that ES is hardly the only way to render or understand the functions and structures of ecosystems. We generally agree that monetary valuation in particular is a narrow form of valuing all that might be called "nature." We readily acknowledge that market prices (real or hypothetical) overlook a range of other values of ES, from their status as a bequest to future generations to the worth that ES have in, of and to themselves. Even those market prices that exist (e.g. the going rate for fish at the market) are likely conservative, when prices suffer from a political economy that discounts ES heavily and frequently does not account for so-called externalized costs to the use (or abuse) of "nature." This critique of the ES paradigm is sometimes extended to suggest that categorization and valuation flow from or reinforce neoliberal ideology; in this way, the ES paradigm may feed market-based conservation policies or support the creation of natural resource markets (often through appropriation) and the development of "neoliberal natures" (Heynen and Robbins 2005; Gómez-Baggethun and Ruiz-Pérez 2011; Castree 2008a; Castree 2008b; Walker 2016). This lengthy critique has considerable purchase but it is also not without its own debate (Bakker 2010; Dempsey and Robertson 2012).

In this paper, we certainly do not advocate for such market-led transformation of ES into commodities. We largely follow Costanza et al.:

"We want to make clear that expressing the value of ecosystem services in monetary units does not mean that they should be treated as private commodities that can be traded in private markets… Even if fish and other provisioning services enter the market as private goods, the ecosystems that produce them (i.e. coastal systems and oceans) are common assets. Their value in monetary units is an estimate of their benefits to society expressed in units that communicate with a broad audience… to inform better, more balanced decisions regarding trade-offs with policies that enhance GDP but damage ecosystem services" (Costanza et al. 2014, p.157).

Rather, we see utility in applications of the ES paradigm and valuation as specific forms of politics intended to engage and inform decision-making about "development" as well as guide and enliven debates over sustainability in environmental management. We are sympathetic to political ecology critiques of ES and valuation — as well as conservation governance and sustainable development more broadly — as being exercises in power. Kull, de Sartre and Castro-Larrañaga note that ES and valuation have been imbued with multiple meanings that are context dependent — "simultaneously a technical, pedagogic, heuristic, policy, and political notion" (Kull, de Sartre and Castro-Larrañaga 2015 p.131) — and subject to different uses by a range of actors from the high modern state to social resistance movements. In other words, the deployment of the ES paradigm and valuation as a tool is deeply imbricated within political contexts where actors have asymmetric power relations. In addition, we remain cautious about the overzealous application of the ES paradigm and its potential, if applied inappropriately, to reduce complex ecological challenges by forcing all environmental use (and abuse) into oversimplified stock-flow frames (Norgaard 2010). Rather, we argue for the use of the ES paradigm and valuation within specific realms of politics and practice.

Finally, we note that, contemporary to the rise of the ES paradigm in the 1990s and 2000s, environmental management trended toward a focus on local governance, decentralization, participatory and so-called bottom-up approaches. This renewed focus on the local saw strong international articulation in the context of the U.N. Conference on Environmental and Development in Rio as "participation" was enshrined in the resulting international declaration. Meanwhile, scholarship surrounding governance of the environmental commons — including celebrated work by Ostrom (Ostrom 1990) — further interlinked the idea of sustainable resource management with local control, subsidiarity and insulation from external pressures. Moreover, both left-leaning critiques of the state (Scott 1999) as well as right-leaning neoliberal theory predict that top-down management of conservation and development would be prone to failure; this is particularly to be expected when managers have little downward accountability to resource users who face the brunt of impacts — positive or negative — from environmental regulations and projects. A focus on locally led conservation can also be understood as a response to data-poor contexts where local knowledge could better govern ecologies that were illegible to management from on-high. However, with increasing public availability of remote-sensing imagery — such as is used in this paper — the meaning of data-poor conservation should be interrogated (Thiemea et al. 2007).

This paper steps into the space between the ES paradigm — particularly as it is sometimes rendered an analytic for cataloguing, measuring and ultimately commodifying nature — and environmental management discourse that privileges the local, particularly in the absence of other kinds of ecological data. We see ES mapping and valuation not as an automatic move to commodify but, rather, as a tool having the potential to inform local processes of environmental politics and decision making. First-pass ES analyses may provide a bridge between recognizing dependency on natural resources and sustainably managing those resources (Termorshuizen and Opdam 2009). We suggest ES valuation as particularly useful in the specific consideration of "development" that drifts into the ideological terrain of neoclassical growth economics and accounting. We argue for the identification and first-pass valuation of ES on a local scale as a specific form of environmental politics, dialogue and advocacy. We see this as one way to open space for critical evaluation of "development" and discussion of sustainable environmental use. In doing so, we also believe we stay closer to the early aims of scholars developing the ES paradigm and valuation exercises by emphasizing the heuristic and political relevance of valuation exercises in specific contexts.

To demonstrate what we envision, we now present an ecosystem service valuation using a benefit transfer model of a shallow coastal estuarine landscape in southwestern India. We end by returning to a discussion of what we see as the utility of the ES paradigm and ES valuation as a specific kind of environmental political practice; as an example, we discuss specifically how the results can be applied and wielded as part of a larger engagement with local and regional NGOs and activists. First, however, we present social, economic, ecological and political context for the study area.

Study context

India's pro-growth economic development has taken a mounting toll on environmental health and ES (Shrivastava and Kothari 2012; Gadgil and Guha 2005; World Bank 2013). Coastal spaces and places — often the commons — in particular are beset by contentious transformations of land use, planning, development and notions of ownership and resource tenure (Kurien 2015; Sridhar, Menon and Rodriquez 2007; Cook, Bhatta and Dinker 2013; Kundu and Sahu 2014). The combination of environmental degradation in many places — coupled with urban development biases and rural economic stagnation — has also contributed to the wider trend of migration to cities (Robson and Nayak 2010). For example, in coastal areas, rural fishing communities are increasingly depleted of labor, at least seasonally, as individual fishermen seek work in large cities — either in ports as boat and dockhands or in the wider urban economy.

In this paper, we report the ES valuation of the core extent of the Aghanashini River estuary, a relatively undisturbed riparian and wetland ecosystem on India's west coast in the state of Karnataka (**Figure 5.1**). The Aghanashini River estuarine region represents a hyper-diverse, socially critical ecology (Chandran, Mesta and Boominathan et al. 2012). More than 14,000 households (approximately 64,000 people) live in villages and hamlets bordering the estuary; the administrative area encompassing the estuary (known as a Kumta Taluk) has a total rural population of more than 117,000 (Census of India 2011). Though the nearby semi-urban town of Kumta increasingly serves as an employment hub, a

large portion of households living near the estuary remain at least partially dependent on estuarine ES for sustenance and livelihoods such as fishing, farming, resource gathering and related secondary employment. Local ecology also provides various other services, including erosion/flood control water filtration, protection from adverse weather and adjustment of microclimate. Many of these ES are expressly acknowledged in our interviews and other ongoing research with community members.[3]

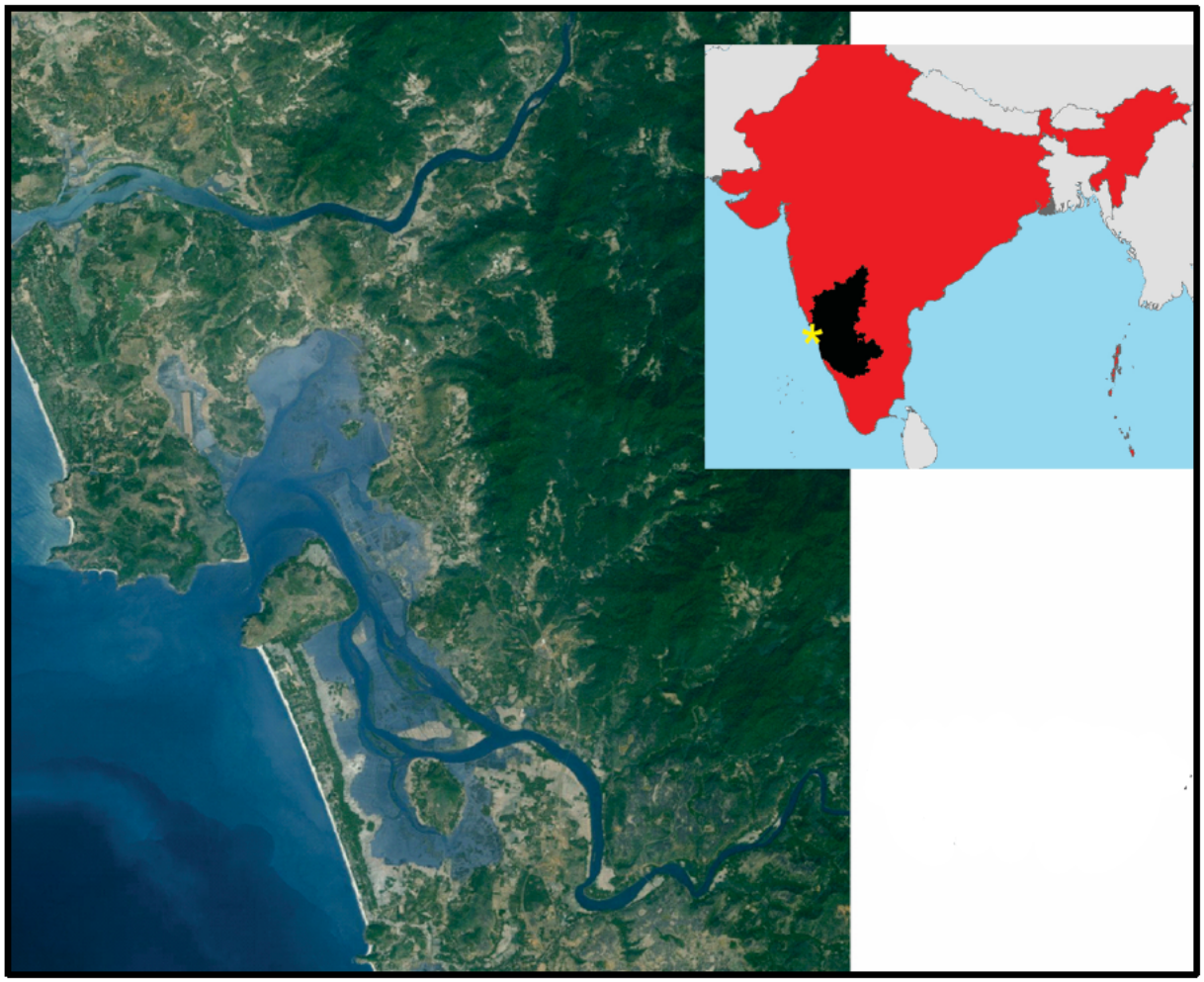


Figure 5.1 *— Location of ES valuation study area*

The estuary is the outlet of the Aghanashini River and its many tributaries that cover a watershed stretching into the biodiverse Western Ghats. The river near Kumta town begins to braid among islands, mangrove patches, floodplains and wetlands before opening into a wide estuary with tidal mudflats. Eleven species of mangroves and more than 30 other mangrove associates extensively cover river and field edges (Chandran, Ramachandra, and Joshi et al. 2012); their extent is actually increasing due in part to aggressive plantation

[3] Field observations and interviews come from extended participant observation, interviews conducted by a research team and other NGO research and conservation programming from January 2015 to July 2016.

efforts of government, civil society and some citizens. More than 100 species of birds are recorded in the estuary small-scale fishers in the river catch nearly 80 species of fish (Bhat et al. 2014) and a vibrant bivalve fishery supports substantial clam, oyster and mussel trade and local consumption (Boominathan, Chandran and Ramachandra 2008).

The estuary also provides a nursery ground for marine species that end up in the nets of open-ocean trawl and purse seine boats that also dock within the estuary. The backwaters are also interconnected to submerged fields and ponds known as *gajni* land, used traditionally for a mix of fishing, aquaculture and cultivation of salt-tolerant rice. Local unemployment approaches 60 percent according to some calculations[4], though many people "work" in subsistence economies and household production outside official employment measurement. Present livelihoods provide standards of living better than much of rural and coastal India. Some fishers within the estuary report that they do not yet face scarcity, and abject poverty is mostly absent. The river also feeds the saline reservoirs of large cooperative and privately owned saltpan operations. Gokarna town, north of the estuary, is known for tourists, temples and beaches, though tourism within the estuary — boating or viewing wildlife around mangroves, for example — is scarce.

While any narrative of pristine nature can be questioned from an environmental history perspective (Rangarajan and Sivaramakrishnan 2012), we describe the estuary as lightly touched. The Aghanashini is one of India's few remaining undammed rivers and no heavy industry or large cities exist on its banks. Local livelihoods do interact with and change the river, but alterations of an industrial scale are not observed. The level of biodiversity within the estuary, coupled with high ES dependence, has motivated multiple civil society and scholarly proposals for institutional protection under different Indian legal frameworks. However, these proposals have garnered little administrative or political support.

This picture is hardly static. Cyclical ecological variation and long-term climate change will force ecosystem and residential shifts. Interviews also reveal an external political economy and poverty alleviation discourse that drive social, economic and ecological changes (Shrivastava and Kothari 2012; Jadhav 2015a). Public and private actors increasingly promote new neoliberal development forms and economic activities. For example, substantial tracts of *gajni* land were converted to permanent shrimp ponds in the 1990s only to be abandoned when the sector collapsed due to unsustainability; today, investors are now repurposing these submerged fields for other forms of high modern aquaculture. Dredging and "mining" the river bottom for shells and sand — used in construction — have also become contentious forms of river use.

The largest source of potential change or disruption in the estuary, however, is a controversial proposed industrial shipping port, zealously backed by the Karnataka state government's industrial development promotion arm. The proposal calls for landfilling a large portion of estuarine shallows for dock construction, while other portions of the estuary would be dredged from a current depth of less than a meter to 16 or 18 meters of depth to accommodate large coal and iron freighters. The project would clear or pollute

[4] Census of India. Primary census abstract 2011. Office of the Registrar General and Census Commissioner, Delhi Available online: http://censusindia.gov.in (accessed on 17 April 2017).

dozens of hectares of natural mangroves, mangrove plantation, fishing grounds, bivalve mudflats and salt pans. Proponents admit a high likelihood of declines in water quality — including riparian flows that feed farm fields — and potential socio-economic disturbance throughout the region (NEERI 2015).

In return, project promoters promise temporary jobs in port construction for local people (while also acknowledging that long-term management and operations at the port will likely be given to outsiders with higher education levels). Some secondary employment — for example, truck repair or petty shops and restaurants to serve new port employees — is also expected, yet significantly more livelihood loss is likely due to foreclosure of current natural resource occupations including fishing, bivalve collection and salt-panning; government analysts admit as much when they suggest a need for compensation for livelihood displacement[7]. In interviews, some residents express support for this kind of industrial "development," which they feel has been denied to the region; others oppose it because of social and environmental impacts. Both positions are colored by specific histories of land accumulation and social ecological traditions (Jadhav 2015a). Local and outside activists meanwhile accuse the government of paying lip-service to supposed democratic and environmental regulatory checks such the mandatory Environmental Impact Assessment (EIA) (Menon and Kohli 2015).

The port project and an ancillary railroad extension continue to move through the central government environmental clearance process. Such projects in India are subject to a regulatory framework governing coastal commons, though actual environmental management remains weak, fractured or nonexistent (Jadhav 2015b). The signature national rule, the Coastal Regulation Zone (CRZ) Notification, theoretically limits development in ecologically sensitive areas and gives dependent communities a voice in environmental management[5]. Yet the CRZ is routinely flouted; monitoring and enforcement are absent, and community participation is an afterthought. Other laws apply to aspects of the coastal commons — e.g. rules governing aquaculture or fisheries — but these are routinely ignored or unenforced. This is not uncommon across India where policymakers often revert to a development vs. environment dichotomy (Ramesh 2010) in which "development" routinely is an ideological winner. As such, the port project is political as well as material; not surprisingly, it is the target of ongoing political contest for and against from local, regional and national actors.

Environmental management — or even weighing potential tradeoffs of a development project such as the proposed port in the Aghanashini estuary— is also hampered particularly by a lack of social and ecological data. Baseline data and mapping has improved some in recent years with particular emphasis on government remote sensing applications (ISRO 2012), yet these activities have been contested by civil society actors on

[5] Even as we write this paper, coastal development regulations were undergoing revisions by government technocrats that are widely seen as diluting protections of livelihoods and natural resources, further calling into question sustainable coastal development (Sinha 2017).

the grounds that they contain politically motivated flaws[6]. Though not a commonplace method, ES study and valuation has been conducted in a variety of Indian cases (e.g. Badola and Hussain 2005; Lele et al. 2011; Maharana, Rai and Sharma 2000; Ghermandi, Sheela and Justus 2016); indeed, some Indian data has contributed to the global ES value database produced by the TEEB project used in this paper. Meanwhile, conservation scientists have argued for a long list of overlooked or understudied aspects of marine and coastal ecology and biology in India (Kuppusamy, Johnson and Pande 2013). An EIA is mandated by law for many intensive "development" projects — including the proposed shipping port— yet such reports are frequently challenged on the grounds that they lack basic facts or contain severe inaccuracies.[7] Various environmental regulations — such as coastal zone rules even now being rewritten by the central government with an eye to easing regulatory hurdles — suffer not only from a lack of data for implementation but also political will; in a sense, the data-poor regulatory environment obscures or elides political motivations in evaluating "development" or sustainability tradeoffs. In the absence of more robust environmental data (as well as politics), Johannes' argument for "data-less management" (Johannes 1998) dependent on local insight gains relevance. An interesting contemporary example highlights fisher communities in southeastern India blending traditional ecological knowledge with increasingly available satellite data to challenge state maps and development plans that ignore or overlook critical natural resources and dependent communities (Kumar, Saravanan and Jayaraman 2014).

This is the context of environmental politics and debates over development in India generally and the Aghanashini River estuary specifically, which we argue can be informed by the ES valuation method we now present.

Materials and methods

We use a simple ES valuation method known as benefit transfer. First, we measure the areal extent of a variety of land covers and then apply a per hectare ES value for biomes corresponding to the land covers identified. We note that this is rather straightforward practice; our intent in this paper is not methodological innovation per se but an argument for this method as political practice.

Our valuation exercise relies on satellite imagery captured of the Aghanashini River estuary on 28 April 2015 by the WorldView-3 imaging satellite[8] and Landsat 8 imagery captured on 1 April 2015 (**Table 5.1**). In addition, we rely on a larger set of formal and informal interviews with residents and experts to help explain ecological, social and economic context as well as physical geography[9]. We used biome values (corresponding to classified

[6] For example, mapping projects and social ecology surveys by the National Centre for Sustainable Coastal Management, though mandated under Indian regulations and by courts for years, continue to be embroiled in ongoing controversies.

[7] For example, the EIA for the Aghanashini port proposal put forward to a public hearing in 2015 contained outright plagiarism, lifting wholesale a policy and economic paper on bivalves in the estuary from scientists at the Indian Institute of Science, while still grossly under-estimating the number of fishers in the estuary.

[8] This high-resolution multi-spectral imagery was specifically awarded by grant from the Digital Globe Foundation.

[9] Field observations and interviews come from extended participant observation, interviews conducted by a research team and other NGO research and conservation programming from January 2015 to July 2016.

land covers) derived from the TEEB (2010b) database, which contains more than 1,350 data points from more than 300 peer-reviewed case studies. These estimates are the same values used by Costanza et al. in their 2014 global ES assessment (Costanza et al. 2014).

Table 5.1 — Summary of imagery

Parameters	*Landsat 8 OLI*	*WorldView-3*
Spatial Resolution	30 m	1.24 m
Spectral Window	0.433 - 2.3 um	0.400 - 1.040 um
Number of Bands	8	8
Radiometric Resolution	16 bit	11 bit
Date of Acquisition	1 Apr 2015	28 Apr 2015

Land-Cover Classification

We perform a land-cover classification using a mixed method classification approach, which involved a maximum likelihood classification workflow with selected training sites (**Figure 5.2**). There was significant spectral variation of the ocean and estuary, which we masked in total as either "marine shelf" or "estuary" (**Figure 5.3**). We accomplished this using a digitized boundary created with expert local knowledge and the 31-centimeter resolution panchromatic WorldView-3 image. We used the same approach for the Landsat 8 imagery.

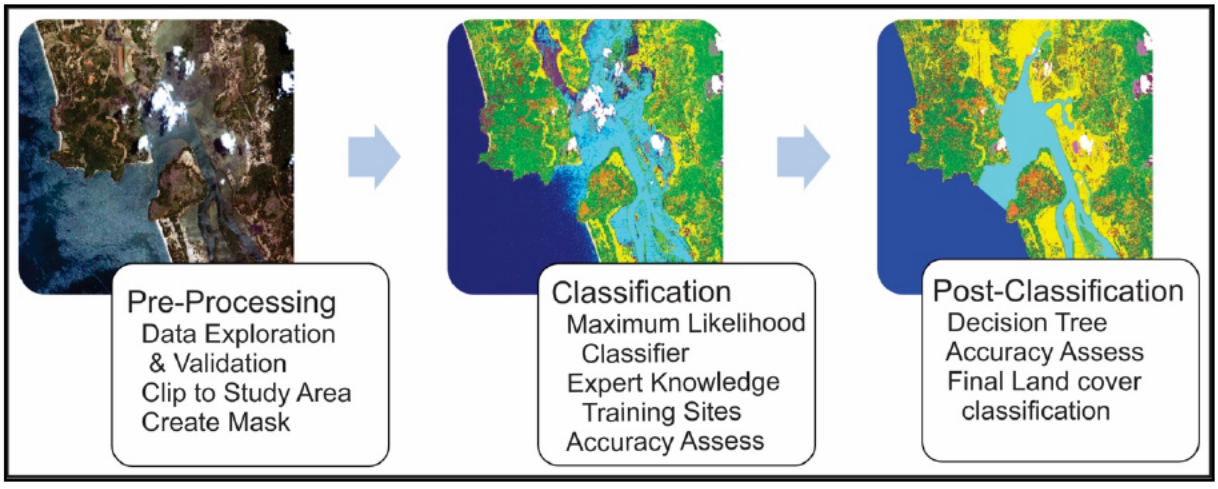


***Figure 5.2** — Image processing flow chart.*



***Figure 5.3** — Masks for marine shelf and estuary used in decision tree classifier.*

In the scene, there is a large amount of fishing, aquaculture and farming in flooded rice fields — the *gajni* land. The spectral reflectance of these areas was indistinguishable from those of the estuary, yet their ES value is more similar to cropland/agriculture, according to local expert interviews. Hence, we separated the *gajni* land from the estuary for the purpose of the biome classification using the Sequential Maximum Angle Convex Cone (SMACC) tool, creating Endmembers. The 9th Endmember raster separated the estuary and aquaculture/*gajni* land and a mask was created containing the two.

We combined the SMACC tool output and the ocean and estuary masks to build a decision tree classifier (DTC) to limit the spatial and reflectance outliers. The original scene was reclassified using the DTC script. The inputs were defined as the following bands in the decision work flow (**Figure 5.4**). The final eight-biome image was assessed for accuracy using a confusion matrix, a simple way of presenting an accuracy assessment of a remotely sensed image (Story and Congalton 1986). The matrix separates errors of omission (i.e. Producer's Accuracy — the number of pixels correctly classified in a particular category as a percentage of the total number of pixels actually belonging to that category in the image) from errors of commission (i.e. User's Accuracy — the number of correctly classified pixels to the total number of pixels assigned to a particular category). The reference dataset was a systematic point grid of our ground-based observations and photointerpretation by local experts. The overall accuracy of the WorldView-3 imagery was 75 percent and the Landsat 8 imagery was 78 percent.

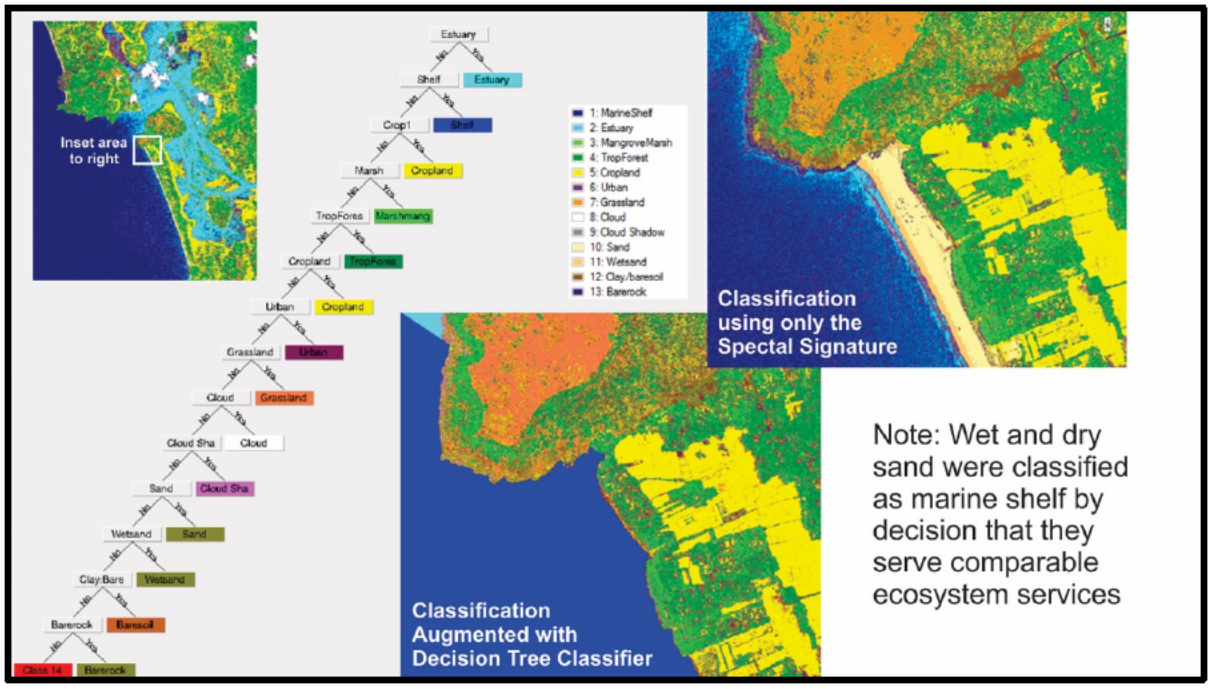


Figure 5.4 *— Spectral and decision tree classification of imagery.*

Benefit transfer

Following land-cover classification, we approximate ES dollar values for the eight land covers identified in the scenes. To the area land cover estimates, we applied the average per hectare biome values derived from more than 300 peer-reviewed studies in the TEEB database (2010b). These are the same values used by Costanza et al (Costanza et al. 2014). This method — known as benefit transfer — is a common method in ES valuation practice that applies biome or land-cover values obtained from studied or known areas to other unstudied areas (Richardson et al. 2015; Rosenberger and Loomis 2003; Johnston and Rosenberger 2010). Not surprisingly, benefit transfer as a value approximation method is more common in cases when producing values in situ is infeasible. In its most simple form, the benefit transfer method may use a single value for a single ES obtained in one place to approximate the same or a similar ES value in another. Often, however, benefit transfer relies on multiple valuations of multiple ES of multiple land-cover types to derive average values for different biomes (our method). This approach offers an inexpensive and efficient way to produce a first-pass estimate of the value of ES, which we believe has relevance in specific debates over sustainable environmental management and the evaluation of tradeoffs associated with “development” projects.

The benefit transfer method has limitations; “basic value transfer is a crude first approximation at best” (Costanza et al. 2014 p. 156). Benefit transfer carries forward measurement errors inherent in any primary study on which it relies, and should not replace methodical and meticulous on-the-ground study. We note, however, that more robust studies often still rely on estimates, approximations, models, simplifications or secondary valuations (Ghermandi, Sheela and Justus 2016; Ninan and Kontoleon 2016).

Meanwhile, local detailed studies in at least some cases prove to be consistent with simple benefit transfer estimates (Kubiszewski et al. 2013). On a more practical and pragmatic level, meticulous economic valuation is a time-consuming and expensive process that is likely out of reach many local actors in many places (Sangha et al. 2017), especially Global South contexts such as India. Benefit transfer then offers a balance — one that must be carefully considered — between "purism and practicality" (Bauer and Johnston 2013). What's more, in addition to overcoming time and funding restrictions, we aim to show with this paper that benefit transfer applications can explicitly surmount political closure of environmental debate over the impacts of "development" and other land-use and environmental change.

While we agree with the sentiments of Loomis and colleagues that it is important to separate credible from incredible approaches to ES valuation, this is easier said than done, as an estimate or method that is "credible" to one person is often "incredible" to another (Loomis et al. 2014). The more than 300 peer-reviewed studies in the TEEB database produced value estimates for ecosystem services using a variety of methods including market value, avoided cost, hedonic pricing, replacement cost, and contingent valuation. All of these methods have biases, uncertainty, and errors and few address the complex spatial dependence of ES (Sutton 2014).

Results

The classified image derived from the WorldView-3 image for the 200 square kilometers around the Aghanashini River estuary (**Figure 5.5A**) resulted in 8 land-cover biomes providing ES value to the area (cloud and cloud shadows were not included as biomes and not evaluated). The final classified image from the Landsat 8 imagery provided the same number of biome classes (**Figure 5.5B**).

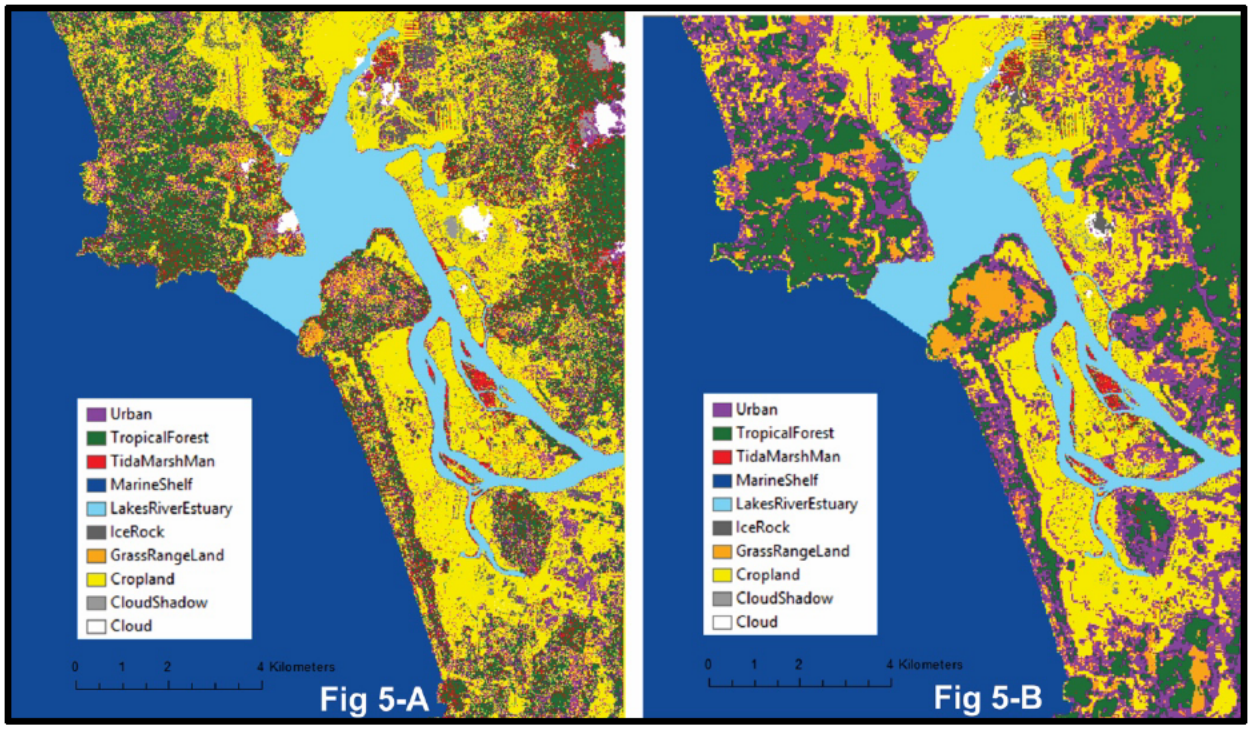


Figure 5.5 *— Final land cover classification; A) results from WorldView-3; B) results from Landsat 8.*

The attribution of values to these two images resulted in a total annual ES estimated value of $257 million per year (WorldView-3, **Table 5.2**) in 2007 dollars and $298 million per year (Landsat 8, **Table 3**). These aggregate value estimates represent a mix of exchange and non-exchange values which accrue to various "users" at multiple scales.

Table 5.2 — ES value estimates derived from classified WorldView-3 image.

Land cover / biome	*Area (hectares)*	*Value of ES per hectare (in 2007 US$)*	*Aggregate ES Value (in 2007 US$)*
Tidal / Marsh/ Mangroves	749	193,843	145,122,646
Urban	1,297	6,661	8,636,490
Lake / River/ Estuary	1,482	28,916	42,860,134
Cropland	4,297	5,567	23,922,321
Tropical Forest	3,156	5,382	16,987,894
Grass / Range Land	237	4,166	988,044
Ice/ Rock	510	0	0
Marine Shelf	8,448	2,222	18,771,116
		TOTAL	257,288,646

Table 5.3 — ES values estimates derived from classified Landsat 8 image.

Land cover / biome	*Area (hectares)*	*Value of ES per hectare (in 2007 US$)*	*Aggregate ES Value (in 2007 US$)*
Tidal / Marsh/ Mangroves	936	193,843	181,506,831
Urban	2,771	6,661	18,454,700
Lake / River/ Estuary	1,485	28,916	42,927,248
Cropland	2,763	5,567	15,380,619
Tropical Forest	3,097	5,382	16,669,453
Grass / Range Land	955	4,166	3,977,738
Ice/ Rock	117	0	0
Marine Shelf	8,456	2,222	18,788,321
		TOTAL	297,704,911

We intentionally do not produce error, ranges or standard deviation lest we reinforce a notion that these values have fine precision. We are hardly alone in this stance (Costanza 20et al. 14). Though the figures result in whole number dollar values, they remain coarse estimates that, as we argue below, constitute an important starting point for environmental politics, debate and discourse.

We note that ES valuation implicates spatial scale in multiple ways. First, global value estimates must rely on merging ES values and uses across spaces (and places) and times, mediated by politics, history, sociology, economics, etc.; we do not presume, for example, that the value — either quantitative or qualitative — of a mangrove ecosystem in Australia is fully equivalent to the value of mangroves in the Aghanashini River estuary.

Second, and similar, there are ES values that vary within the scale of analysis. While the immediate exchange or use value associated with a discrete fishery harvest from the estuary may not change with the extent of analysis — i.e. the fish represent the same price when sold at the local dock or the same number of calories when consumed — some benefits such as carbon sequestration effectively accrue to populations far away from the mangroves. Those ES values may only be fully assessed at scales beyond the local.

Additionally, land-cover classification from more coarse-resolution imagery (more economical or free for larger extents of analysis) typically results in lower values (Konarska, Sutton and Castellon 2002) as high-value but rare biomes (e.g. mangrove wetlands) are often less visible in coarse-resolution imagery. However, in our case, we observed a decrease in calculated value at the higher resolution. The Landsat 8 image identifies more urban area (with an associated ES value of $6,661 per hectare per year), whereas the WorldView-3 imagery identified relatively more cropland (valued at $5,567 per hectare per year) (**Figure 6**). This partly results from land use patterns in this region where many small properties have multiple land cover types; at the 30-meter spatial resolution of Landsat 8, many pixels that are a mix of roads, small gardens, field, tree plantations, and human settlements become identified as "urban." We note that this rural environment is fairly densely populated. More than 60,0000 people live in villages bordering the river estuary alone, and we estimate more than 115,000 humans live in roughly 100 square kilometers of land in these images. This density would warrant the classification of "urban" in many schemes. The density also exceeds that of many urban-suburban metropolitan areas in the United States and Europe.

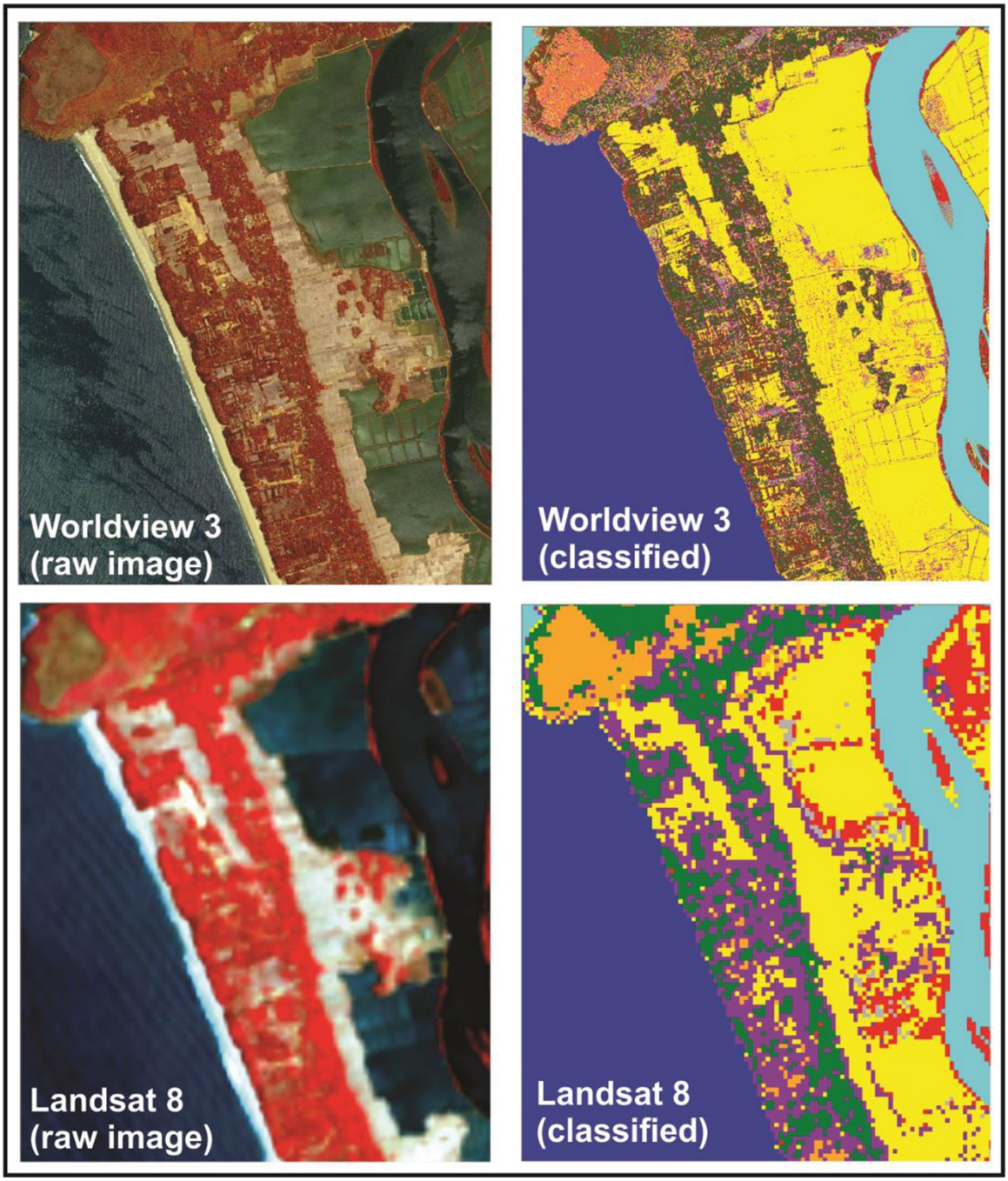


Figure 6 *— Effects of spatial resolution on classification.*

Discussion

The ES values reported here, though only estimates, do represent manifest local, regional and national exchange values, ranging from income earned in the tourist economy at local beaches (e.g. Om beach, a popular destination for tourists from across southwestern India) to the prices of fish sold in markets. For example, more than 2,000 people around the estuary work in various livelihoods related to harvesting and sales of bivalves (oysters,

clams and mussels) and their shells; according to one estimate, this slice of the local fishing economy generated Rs. 57.8 million in annual income in 2006 and 2007 (or about $1.28 million) (Boominathan, Chandran and Ramachandra 2008)[10]. Other ES carry significant local non-exchange values, from subsistence food production to drinking water filtration. Local cultural values range from the traditions associated with fishing as heritage, boat building, so-called sacred mangroves and a river deity. Meanwhile, in line with the earlier discussion of scale, still other ES values accrue nationally and globally in the form of services such as biodiversity preservation and carbon sequestration. Many other monetary values — such as regulating services and supporting services provided by the coastal commons —are not automatically realized in any market. Indeed, many of these values represent ES that would only be priced if they were lost and replacements had to be bought (either by the state or individuals). Still others — particularly social, cultural and intrinsic values — may be impossible to price in any case.

Our ES value estimates remain just that — estimates. Yet we certainly do not see them as dubious; they are derived from the hundreds of studies globally that constitute the TEEB database (including cases from India, our study's national context). Furthermore, in agreement with Costanza et al. (Costanza et al. 2014), we believe more robust and rigorous study would find these values to be *conservative* estimates of the contribution that ES make to human and non-human well-being. While we understand that decision-makers often clamor for precision, a robust cost-benefit analysis for a particular compensation scheme or project is explicitly not our aim.

ES valuation suffers from a particular enduring problem in that ES present a combination of so-called market failures. ES are simultaneously public goods, common property and affected by both positive and negative externalities. They also, sometimes, have unclear and variable property rights in space and time. This is particularly true for the coastal and estuarine commons (Barbier et al. 2011). In addition, precise valuation of ecosystem services will always have to account for non-linear functions relating the spatial and temporal distribution of people, money, and the ecosystem services themselves. It is because of these sorts of complexities that assumptions of precision are problematic. For the same reason, we are not interested in making increasingly precise measures of ES value. Rather, we are interested in demonstrating that credible and defensible approximations of the value of ES (despite myriad uncertainties and errors that often cancel each other out) are in many cases so much larger than the value of the market economy that they can no longer be ignored or treated simply as trivial externalities that policy makers will eventually develop policies for internalizing. We present this valuation in the spirit that we need new institutions and environmental politics with broader visions of value in order to chart a path forward that is both sustainable and desirable.

Understanding that the ES values reported here are only estimates does not undermine their political import. We stress that ES and their values function as boundary objects, transcending narrow disciplinary concerns, methodological debates or limited policy

[10] Historical exchange rate data. Available online: https://www.rbi.org.in/scripts/PublicationsView.aspx?id=15268 (accessed May 16, 2017).

utility. Our goal is to demonstrate the ways that these ES values, even as first-pass estimates, open up space for environmental political practice in the context of the proposed port that largely occludes consideration of ES. Policymakers who might dismiss these values or a transparent application of the benefit transfer approach risk ignoring what others have suggested amount to "good enough" (Bauer and Johnston 2013) estimates of the relative importance of the contributions of ecosystems to human well-being.

These ES values, then, enter into political debates as they represent what might be sacrificed or preserved by either "development" or environmental management. While many of these ES do not have an actual market price, real values of the environment are often discounted in a "development" discourse in India that privileges purported economic growth when evaluating projects, infrastructure and the like; the Aghanashini case provides a demonstrative example. For an imperfect comparison, then, consider that the state government calculated Gross Domestic Product of Kumta Taluk (the administrative territory encompassing the study area as well as the semi-urban nearby Kumta town) to be Rs. 3.6 billion or about $80 million in 2005 (GoK 2015). Estuarine ES worth $257 million (2011 values in 2007 dollars) dwarf the purely economic output of the entire taluk only six years prior.

Many of these ES values and benefits could be lost if the estuary is degraded or significantly altered (as would happen via the construction and operation of large industrial shipping port). Such changes would undermine the resilience and self-sufficiency of the local population, with unintended and challenging social and political conflict and tension resulting. This is a story that repeats widely across India and indeed the globe where ideological imperatives of development have overridden claims to both the quantitative and qualitative values of natural resources that accrue to local, regional, national and global citizens. Additionally, degrading regional biocapacity will have cascading effects in more distant geographies. For one, loss of ES that support livelihoods and wellbeing might only increase phenomena such as migration and internal displacement (Myers 2002), part of what Sassen has termed "expulsions" (Sassen 2014). Such environmental losses may also lead to worsening India's dependence on lands beyond national boundaries; India is currently one of many countries appropriating ecological assets internationally (Coscieme et al. 2016).

In attending to monetary ES values, we do not suggest dollar estimates are the only or best way to account for the importance of the environment. Diverse methods of valuing ecosystems are important; in the Aghanashini case, additional research into local social ecological traditions — without monetary valuation — would almost certainly raise political questions about the use and abuse of nature. For example, local traditions include sacred patches of mangroves and, for some, worship of a river deity; more robust study and recognition of these value-laden practices could bring them into conversation with the shipping port development agenda which puts their material ecology — a functioning estuarine ecosystem — at risk. Yet, at present, the methods of economic measurement such as the above-quoted GDP statistics remain nearly hegemonic.

We feel the need to state again that we do not intend to serve capitalist exploitation or commodification of nature by creating inappropriate (possibly absurd) markets or specious prices. We see ES valuation not as inherently serving a neoliberal agenda but interrogating it, of asking what is to be given up in the name of certain kinds of "development" or what are the uses, benefits and potential losses (and for whom) of particular forms of environmental management. As such, we are attempting to wield ES valuation as a critical tool to make more legible the serious, uneven or hidden tradeoffs of "development." In the Aghanashini case, there remains no institutional mechanism to privatize and commodify many ES of the estuarine commons, but they presently fade to a zero-dollar value amid the "development" ideology in India.

ES valuation in environmental politics

We conclude this paper with discussion about how this exercise and these ES value estimates can enter into environmental politics. We argue benefit transfer application can quickly produce rough estimates with potential impact in a variety of forums — from community organizing efforts to media to public hearings to court proceedings. Even if these values ultimately require more interpretation or are subjected to debate or criticism, the dialogue achieved, we argue, opens up space for environmental political practice. Here, we rely on several years of survey research, interviews and participant observation with Indian non-governmental organizations (NGOs)[11] as well as a shorter stint within an Indian government research institute by one of the authors. We note that our study occurred simultaneous to ongoing activism, conservation and development programming by multiple actors within the study site, including NGOs, government officials and private individuals and organizations.

Some local residents and officials have spoken out against the port project; the most vocal opposition has come from residents whose livelihoods depend specifically on estuarine goods and services (primarily fishing) highlighted by this analysis. For example, one fisher interviewed in March 2016 was quick to recall other development projects including a power plant that have been opposed by the estuarine community because they would alter the local social ecology. "Of course, we'll fight this, too. This is our river. Our lives depend on this." In addition, environmental activists and scientists have also opposed the port and the larger development process. Many of these actors spoke at a public hearing in March 2015 and subsequently engaged in letter and report writing tactics, calling for additional study (and recognition) of the complex social ecology of the estuary. Even some officials within regional and state environmental bureaucracies have spoken against the project, though rarely in public.

However, a strong push remains underway by one arm of the state, coupled with private capital interests, to build the industrial port. A vocal segment of local residents — especially members of business communities who may possess the resources to benefit through secondary businesses eventually serving the port — have also spoken in favor of

[11] Field observations and interviews come from extended participant observation, interviews conducted by a research team and other NGO research and conservation programming from January 2015 to July 2016.

the port, echoing state officials who say the area and the nation need "development" and that some sacrifices must be made for that cause.

Even local supporters of the port express reservations about whether the promised benefits — primarily roads, some permanent managerial jobs, temporary construction jobs, corporate social responsibility-centered "development" such as a hospital or financial compensation for lost natural resource livelihoods — will materialize. A local businessman involved in salt-panning said in a May 2015 interview, "We want this port because we deserve to see this development in our region. But we will make sure that we are compensated for any loss of livelihood. The fact is that this won't happen without our approval. And so we'll make sure they will bring benefits to us." We note that both the "they" and the "us" in that equation remain highly uncertain. As of writing of this article, corporate partners for construction and operation of the port — the entities who could ultimately be responsible for those benefits — remain unknown. Similarly, the ultimate design — which will determine which ecologies and ecosystem users are affected — has not been finalized.

Occurring in this context, our research serves to highlight the potential ES that are unevenly implicated in this development project. For example, ES associated with mangroves, mudflats and inundated croplands will all be affected by the port project, yet those differentiated values accrue to different users. Even our first-pass ecological baseline of land-cover and valuation for the estuary has not previously been published, so these explicit values have not factored outright in official debates over the port. We submit that these values have been ignored intentionally by a political process and development ideology that heavily discounts ES; for example, minutes of government meetings reveal that project proponents have claimed, in order to secure approvals, that fishing livelihoods dependent on mudflats and mangroves will not be disturbed (GoK 2015a). These claims are contradicted by identification and specification of biomes and ES values that will be unquestionably degraded by the port. At the same time, these values have also not been available to local activists proposing alternatives of environmental protection and management (Hegde 2014).

Even first-pass ES valuation then offers a chance for more deliberate, grounded debate on the merits and impacts of the proposed project; identification of ES and their values (and subsequent users) can be another step toward the political project of recognizing and distinguishing demands of those who stand to gain from the port project as well as those might lose. We have attempted to disseminate our findings locally — presenting versions to local elected officials, activists and bureaucrats. Our goal in this effort is what we attempt to demonstrate in this paper: the wielding of ES valuation as an initial foray into environmental politics. Meetings where we have presented the results of this and other research have often turned into strategy sessions for how to marshal evidence regarding the consequences of port development. Some activists have also threatened lawsuits contesting port project government clearances on procedural grounds as well as on the contention that ES values (even without financial estimates) have been overlooked. One NGO has on multiple occasions called for "ammunition" from researcher-activist networks in what is expected to ultimately be a legal battle to challenge the data-poor basis for

environmental clearance of the project. We do not seek to automatically be obstructionist, but rather we argue that ES valuation serves as a kind of heuristic "countermapping" (Peluso 1995; Harris and Hazen 2006) and a starting point for environmental political praxis.

We earlier noted that environmental policy decisions in India are often made in a data-deficient environment; in the case of the proposed shipping port, one of us has argued, as an activist, that data is not only lacking but is intentionally left out through an official but gamed EIA process more akin to boosterism than critical evaluation. We quote at length a veteran local ecologist, who penned a 14-page letter to the government science commission that oversees the institute that produced EIA for the port project:

> "It is very evident that either due to ignorance or design, the EIA team … presented a seriously erroneous picture, particularly of the estuarine ecology and also biodiversity of the adjoining lands integral to the estuarine system. The team also failed to provide a convincing picture of the socio-economic implications on the community that would ensue the port execution. Yet, with all these glaring shortcomings in the EIA study, the proponents and the consultants were able to secure a favourable recommendation [from a government project review committee] for execution of the port project, which would amount to large scale destruction of the estuarine system and inflict serious livelihood consequences in the coastal zone."[12]

A more thorough review of potential degradation has been foreclosed, at least in part because of the expense of marshaling empirical data. One official within the state forest department — the agency in charge of protecting mangroves within the estuary — asked us on more than one occasion in 2016 for research on local relationships to mangroves; he said he was unable to devote funds and staff to such research precisely because of the inter-bureaucracy political climate in favor of port development. Indeed, the generation of primary data ES values for multiple of biomes with dozens of locally specific ES would be a massive undertaking requiring significant time and funding. Instead, this paper offers a case study of a relatively inexpensive method — possible even for NGO actors with minimal technical assistance — that quickly can bring more data into a conversation that should not end here. Our exercise is only a foundation for additional study. We further allow that such data need not only be used to block "development" projects like the port; rather, we argue a more full-throated interrogation of the project — enabled in part by such ES study — could ultimately lead to additional environmental protections and democratic deliberation of the terms of "development," even if the project proceeds.

Conclusion

Finally, we return briefly to the criticism and debates of ES and valuation paradigms, which have received and deserve continued debate (Schröter et al. 2014), not the least because of the possibility that valuation of ES may pave the way for commodification and/or seizure of ES by neoliberal agendas (Heynen and Robbins 2005; Gómez-Baggethun and Ruiz-Pérez

[12] Though the letter was delivered to officials in February 2017 and circulated among activists and researchers, we choose to provide the author the protection of anonymity under our own research ethics.

2011). We suggest these values have economic (and therefore political) import; residents around the Aghanashini River estuary do indeed ascribe much tangible value — and, in some cases, specific market prices to — the ES that underpin their livelihoods and lifestyles. However, to suggest that these natures and natural resources have great value worth noting is not the same thing as seizing them in a "development" agenda that amounts to Harvey's notion of "accumulation by dispossession" (Harvey 2004). Indeed, in the context of the Aghanashini River estuary and proposed industrial development, we see the exercise of ES valuation as quite the opposite, as a kind of engaged scholarship intended to provide evidence of what stands to be lost, who stands to lose it, and what perhaps deserves sustainable alternatives. Furthermore, far from ignoring critiques of the ES paradigm, we would also welcome intra- and inter-disciplinary engagement such that "critics of ES and neoliberal natures can find a useful solidarity with people engaged, through ES policy, in opposition to business-as-usual resource development" (Dempsey and Robertson 2012 p. 773). Future study in the Aghanashini River estuary might attend to political ecological drivers of change in these ES values and their framing (Kull, de Sartre and Castro-Larrañaga 2015). Our maps and ES values may also serve as a starting point to "address power relations more centrally" (Berbés-Blázquez, González and Pascual 2016 p. 134) in the ES approach by teasing apart to whom ecosystem service values (or losses) accrue and why. That would be a further step toward research-as-praxis, enabling environmental politics and fueling important conversations and debate among crucial actors — local, institutional, state, private and community — over the tradeoffs of "development" and the practices of sustainable environmental use or abuse.

Chapter 6 | Development and/or abundance for whom? The future of the Aghanshini River estuary



Figure 6.1 *— The Aghanashini River estuary at 6:04 p.m., 28 February 2023. Author photograph.*

Coda

It's late February and the evening sun hangs low on the western horizon, bathing the calm expanse of the Aghanashini River estuary in an orange glow. The dry season is just arriving here on the narrow spit of coastal flatlands and backwaters tucked between the Arabian Sea and India's Western Ghats mountains. The air around the estuary is warm and humid, and the smell of salt, sand and fish wafts pleasantly. Boats bob on the surf, seabirds wheel about overhead. My bicycle lies next to me, coated in the same red laterite soil dust as the rest of me. My only goal is to watch the sun sink toward the sea.

After more than six years away from the Aghanashini, I made a whirlwind visit in winter 2023 to catch up with old colleagues and comrades and lay eyes on the (wet)landscape that had been my daily reality for much of 2015 and 2016, when I oversaw research and programming for a small, nearby conservation NGO. This rest stop on the shore of the estuary replayed what had been a regular ritual for me — a bicycle ride from my old field station a few miles away to catch yet another stunning orange sunset sky reflected across the backwaters. Despite the long absence, more than one fisher recognized me, pointed, laughed, waved and shouted hello.

After 20 months leading the Panchabhuta Conservation Foundation (PCF), I left India for doctoral study. At that time, the estuary and surrounding fields and forests supported a

(re)productive *peasant abundance* capable of supporting politics in its defense. For decades, estuary residents have repeatedly opposed the most destructive forms of industrial development — including factories, power plants and shipping ports — and the estuary's biodiversity and increasing mangrove cover have made it a conservation "bright spot" in the eyes of regional and national environmentalists. This stood as a remarkable contradiction to the general trend of dispossession and displacement of rural coastal communities in the name of the India's Blue Economy of coastal and marine capitalism (scaled-up to industrial fishing, wetland conversion to aquaculture, supposedly eco-friendly tourism, coastal real estate turnover, shipping harbors, special export zones and the like.). The estuary's agrarian ecology and economy also represented the counterfactual to elite narratives about backwards rural producers and the inevitability of peasant extinction. Or so I have argued in this dissertation.

Awash in the aesthetics of the moment — sun shimmering on the water, sea breeze blowing in, the rhythmic splash of waves against boat hulls **(e.g. Figure 6.1)** — I had no trouble imagining that here was the *same* estuary just as I remembered, nothing changed, nothing more "lost," the *same* (wet)landscape of the *same* peasant producers and the *same* mangrove swamps teeming with all the *same* biodiversity. After all, the industrial shipping port proposal that threatened to sacrifice the estuary had since stalled in regulatory limbo due to a combination of political resistance and the project's enormous costs. And had not that family of fishers working in their *same* courtyard — sorting the catch, readying nets, preparing dinner — just sent over a teenage son to confirm that I was indeed that *same* "healthy" foreigner, from that *same* NGO, who used to cycle by several years back?

However, to imagine the sultry, sensual estuary before me as an idyllic backwater(s) preserved from the worst vagaries of "development," capitalism or frenetic urban lifestyles, would also require accepting the myth of a static rural landscape of backward peasants — a refugia in time and space, left behind in the waiting room of modernity or outside it altogether. To do so I would also have to set aside commitments: of critical geography's relational understanding of space, where any given *place* is always made concrete, meaningful and "real" always through dialectical interconnections to other *places* (N.B. Massey 1994); or of political ecology's methodological insistence that long "chains of explanation" necessarily span the globe, connecting one geography's politics, political economy, history, culture, etc. to others at multiple scales (N.B. Blaikie and Brookfield 1987). Indeed, I would need to hypocritically ignore my own research about the history, politics and contemporary dynamism of the estuary.

I would also have to overlook the reality around me: The Aghanashini's economy and ecology remain very much in the material and discursive crosshairs of Blue Economy capitalism that portends transformations, both creeping and abrupt. Though I have highlighted a local colonial and postcolonial history of resisting the most destructive forms of "development," the preceding chapters have also gestured to multiple forces that portend change, internally and externally, from above and below. Below I discuss a range of "developments" visible around the estuary during my brief return.

The ecotourism turn and the de/revaluation of the estuary

The Aghanashini Estuary remains relatively isolated from much of the subcontinent by the Western Ghat mountain range. Reaching here from major cities beyond those on the nearby coast — Bangalore, Chennai, Hyderabad, Mumbai or even Delhi — is a long journey, often a full day of travel and possibly requiring an overnight stop and the coordination of connections between planes, trains, buses, taxis and/or autorickshaws. This geographic fact has contributed historically to underdeveloped transportation infrastructure and buffered this section of coast from urban India's frenzied capitalism. Yet the resulting preserved biodiversity has also encouraged the steady creep of ecotourism intending to capitalize on the Aghanashini's allure as untrammeled wetlands. **Chapter 4** notes how this supposedly sustainable form of tourism — idealized as making environmental preservation profitable through revenues from visitors who pay to see "pristine" nature — has driven land speculation and grabbing; despoliation and enclosures of the coastal commons; and myriad new local social, economic and pollution pressures across India and beyond (Ali et al. 2021; Bhatta 2019; Kanan et al. 2020). Though not new to the estuary, tourism had previously been concentrated north of the estuary around Gokarna's beach shacks, yoga resorts and an ancient temple complex. By 2023, dozens of hotels, compounds and campgrounds had proliferated along the miles of sandy shoreline stretching to the south of the estuary, where there had previously been fishing hamlets and only a handful of guest houses (and PCF's field station). During the peak season now, music blaring from resort parties drowns what had previously been the loudest amplified "voices" around: the muezzins and their PA systems for calling prayer. Arguably proliferation of beachside Airbnb rentals scattered among fishing households constitutes the greatest harbinger of the Aghanashini's "ecotourism turn."

Globally, ecotourism has become a vogue means to supposedly hitch aims of environmental preservation to capitalism's profit motive (cf. Fletcher 2014), in what can amount to "exporting paradise" (Clancy 2001) through the "conservationist mode of production." A nature tourism economy, of course, is not a new model. States institutionally protecting environments for the appreciation of future moneyed visitors dates at least to 1872 and the creation of Yellowstone National Park in the U.S. (generally considered the first national park globally). One of India's most celebrated ecotourism destinations today — Jim Corbett National Park — began as a game reserve and playground for British colonizers from the 1930s. And by that time, the subcontinent already had a long history of rulers setting aside lands to preserve wildlife, generate a supply of war elephants or monopolize trade in a particular produce. Other forms of social protections for land and environments — e.g. maintenance and worship of sacred groves and spaces — are far more ancient (Rangarajan and Sivaramakrishnan 2011).

Today, however, tourism focused on natural environments has new relevance in the dream of the Blue Economy touted by both India's right-wing central government and the opposition party state government in Karnataka. And the hundreds of acres of former *gajni* lowlands in the Aghanashini Estuary appropriated by the government decades ago remain idle, a resource on state registers waiting to be put to "improved" uses and burning a hole in the pocket of planners, so to speak. The port project was only one in a long line of attempts by state and capital to kickstart industry within the estuary and capitalize on its ecology and geomorphology. A caustic soda factory using abundant oyster shells operated

briefly, but other proposals for a ship breaking yard, power plant and multiple iterations of a harbor have repeatedly failed in the face of local opposition but also risen again like a kind of development "zombie" (cf. Peck 2010). This helps explain why the state agency responsible for the failed shipping port — the Karnataka State Industrial and Infrastructure Development Corporation (KSIIDC) — has pivoted and is now promoting a 300 crore rupees / $35 million tourist "destination" centered on the estuary backwaters. The *Deccan Chronicle* reported on an August 2023 meeting of state bureaucrats and politicians presenting a "master plan" for "a state-of-the-art resort, 184 tree huts, 70 hotel rooms, an eco-friendly walking trail, a yoga center, paddle boats, suspended bridges and skywalks, among other amenities."

After a series of organizational reboots and personnel shuffles, PCF's founder/director has also enthusiastically embraced eco-tourism as a development model, and he is building high-end, eco-friendly accommodations in a secluded cove just inside the estuary mouth. The NGO field station — my base of operations for much of the research presented here — has been converted to a boutique eco-hotel and upscale café along with a small-scale "natural" cosmetics workshop that hires locally and supplies the hotel's toiletries.[1] The founder and his wife, who now live on site, have now invested millions of rupees in property and construction and eagerly promote this "green economy" as the estuary's "future with nature." Apart from luxury sustainable architecture, their model includes kayaking among mangroves, farm-to-table meals, oceanic adventures with fishers-turned-guides, hikes among historic landscapes (i.e. that now crumbling hill fort held by centuries of successive rulers) and, of course, lounging in and next to the sensual sea.

Unsurprisingly, I am conflicted. I have known the founder for nearly a decade and genuinely believe his commitment to environmental protection — while largely of an elite, bourgeois variety — roughly equals his commitment to capitalism, an internal contradiction quite rare among real estate developers today (and I've met more than a few in India). Thus far, his hotel projects have used local materials, bought more produce locally, paid better-than-average wages and sponsored more community entrepreneurs than other tourism operators old and new, many of whom have encroached on beach spaces, filled in wetlands, clear cut vegetation and dumped both sewage and garbage freely. In short, PCF's eco-tourism turn has largely demonstrated that a lower ecological footprint is possible in this sector compared to many neighboring ventures (though his properties still have air-conditioning). He talks excitedly — easily mustering the entrepreneur's optimism and showmanship — about the possibilities for "scaling-up" a regional, high-standards eco-tourism industry and he envisions a race-to-the-top that challenges real estate norms in India (cf. Sud 2021). In advocating for his investments, he will also remain a loud voice that can keep "sustainable development" on the political and policy horizon and challenge the most destructive elements of the Blue Economy identified in this dissertation.

[1] On my return visit, I stayed at PCF in full renovated guest room that with a 50 percent "friends and family" rate still cost 7,500 rupees / ~ $90 per night. And these are going rates today for upper-middle class tourists who are primary customers in India's ecotourism economy.

However, there are contradictions and limits, and I remain skeptical of this neoliberal model of environment-friendly capitalism that still relies on commodifying and preserving scarce "nature" to serve rich consumers and produce industrial profits, while promising to "protect" coastal environments (primarily through privatization/enclosure). And while PCF and its founder have actively campaigned against high-profile industrial development within the estuary, eco-tourism's business model hardly disrupts capitalism's broader logics of race/caste, gender, class and property, and is as likely to reinforce inequality as ameliorate it. As practiced in India, land development also requires a coziness with state and elite power. In this way, PCF provides a kind of example as it morphs into an eco-tourism enterprise, that offers sustainable development programming on the side (a water conservation project, agroecology demonstration, waste management advocacy). Operating increasingly as a hotel developer first has brought PCF into conflict with local residents, both those against further tourism development in the area as well as those who have embraced ecotourism in ways that conflict with PCF's boutique model. Tensions with PCF's immediate neighbors over everything from fence lines to water use to marauding cattle have become mixed with broader fears about tourism: more privatizations of the beach commons? additional disruptions to social norms? inflation and scarcity of necessities? mounting trash and pollution? Animosities have only increased over disputed boundaries, development rights, water rights or access to a meadow commons; PCF's founder says he increasingly contemplates legal action — e.g. threatening to "call the cops" or seeking an injunction against a local tourist boat operator over trash on a beach — while also accusing various local officials of seeking bribes, payoffs and informal kickbacks for securing various development permissions and approvals. Such accumulating antagonisms between tourism ventures — whether by PCF or others — and local community ambitions only raise additional questions about the possibility of eco-tourism producing something like critical sustainability or environmental justice, now or in the future.[2]

I am not categorically denouncing all attempts to foster an ecologically sensitive, low-footprint economy around the appreciation and preservation of natural splendor as spurious, cynical or rapacious capitalism masquerading as green developmentalism. Of India's Blue Economy agenda items, ecotourism is the most explicit in its pursuit of environmental preservation and sustainable development. Some civil society actors who organized and politicked against the shipping port project, including PCF, have promoted ecotourism experiments at various scales. And often, any single project or enterprise of low intensity may not present environmental or social problems. One conscientious fisher family that picks up alternative income using their small motor launch to ferry hotel guests among mangrove stands presents little threat to the estuary's health. One respectfully designed stand of temporary beach cabanas might be a respectful compromise with neighboring fisher households. And yet local families, activists and scientists all fear where this development path leads. Not all projects or programs are equal, nor will a few local enterprises have the same footprint as an industry that attracts large hotel chains looking for scalable profits or property speculators looking for quick returns. In short, the details of who, what, when, where, why and how matter in parsing claims of "sustainability" or

[2] I remain a constructively critical "friend" of PCF, both hopeful and yet fearful. For more on the contemporary NGO, see: https://www.panchabhuta.org/our-role and https://www.panchabhutaretreat.com/our-story.

"sustainable development." As I have argued in this dissertation, rather than objective terms, these concepts form a mutable, discursive terrain for advancing a variety of political and economic ambitions, including ones that are quite environmentally destructive (e.g. the shipping port proposal that boosters hailed as a model of "development in harmony with the nature").

Ecotourism then rather obviously possesses the potential to run amok — like any other development model — and undermine or even destroy the very environments it seeks to preserve and "value" (as well as the communities they support). The case of the Aghanashini estuary shows how the creep of beach and backwaters tourism portends all manner of disruptions to existing agrarian life and livelihood. In this way, the ecotourism economy poses the real and present danger of *material* devaluation of the estuary's peasant ecology and the economy it supports. My dissertation, however, suggests a second line of critique of ecotourism that rests not on the details or outcomes of any given project or plan, but rather on its internal logic and discursive practices.

Note how the ecotourism currently envisioned by state planners for the Aghanashini estuary depends in multiple ways upon the existence and maintenance of mangrove swamps and estuarine biodiversity as a pristine-but-scarce "nature." *First*, even the dubious conceptualizations of untouched and untrammeled environments or "wilderness" beyond human impact only make marketing sense under broader conditions of scarcity. Terms such as "pristine" and "remnant" are relational and imply another geography (e.g. from whence the tourist comes) where degradation is the norm and such nature is scarce. *Second*, the environments which ecotourists target for valuation logically tend toward the spectacular, another relative term that implies scarcity; visitors pay to witness (and entrepreneurs scheme to exploit) the rare, odd, curious, unique, strange, charismatic, one-of-a-kind spectacles of nature that exist beyond daily existence. In coastal and oceanic India, ecotourism typically promotes encounters with marine mammals, turtles and rare seabirds or adventures on coral reefs and in mangrove wetlands (e.g. Aghanashini backwaters). *Third*, the economic processes of valuation, commodification and marketing require scarcity (or at least consumer belief in it). Simply put, that which is abundant cannot become the foundation of property (private, state or other) that is a precondition for rent and profit extraction. In more prosaic terms, trying to charge money for something widely, freely available is not a sound business venture. And yet actual material, experienced scarcity is not something that ecotourism projects explicitly aim to create.[3] Rather, ecotourism and other forms of the conservationist mode of production *discursively* produce or manufacture scarcity, creating an imaginary or narrative of a dwindling-but-pristine environment. Only when a special environment is threatened, when there isn't enough nature to go around, or when someday soon it might be gone can the ecotourism model offer its purported solution of an economy based on realization and preservation of environmental value.

[3] Of course, devaluation by degradation can happen quite easily; for example, just south of the estuary mouth, a former landscape of tide pools created by the mixing of freshwater springs and ocean surf has been smoothed over with sand and enclosed to serve as small resort's dining and social space.

All manner of discursive actors and practices aid this in this narration of scarcity, and **Chapter 3** of this dissertation specifically presents an array of diverse and contradictory "speakers" that describe the Aghanashini's economy and ecology:

- ecologists who publish science about threats to the estuary;
- the authors of an environmental impact assessment that downplay the ecology threatened by a port proposal;
  capitalists ranging from fish farmers to hoteliers who claim development itself is so scarce that they are just meeting demand;
- government officials who suspect peasant fishers and farmers of ignorantly or maliciously damaging protected mangroves; and
- environmental activists who write op-eds, organize protests and contact bureaucrats.

It's here that my critique of ecotourism makes a third move, drawing on the Aghanashini case. Consider that the (mostly) elite voices encountered in this dissertation frame the estuary's dynamic ecology and biodiversity as in need of both protection (in response to scarcity elsewhere) and sustainable development (in order to restructure the economy around conservation). Yet the environments to be protected — stunning swaths of mangroves and associated flora and fauna — are not inherently the contemporary (wet)landscape created and cultivated by small fishers, farmers and foresters. The chief constituent of ecotourism remains the paying guest, whose money will allegedly protect the estuary's remnant pristine nature from scarcity and preserve it for future paying guests. And while some forms of tourism might coexist or even synergize with agrarian lifestyles and livelihoods, they also generate competing uses for the coastal commons and replace older valuations with new ones. Sacred mangroves become hikers' playgrounds. Shallow fishing grounds are now paddleboarding routes. Fish drying grounds meet the sunbather's displeasure with the scent of gutted catch. A temporarily fallowed field becomes a trash incineration ground. Tourist huts on stilts arise from former fields of rice paddy. Understood critically, I am describing a mode of development (and the politics/policies enabling it) that privileges the capture of tourist dollars and subordinates the basic (re)production needs of rural communities. In this way, the Aghanashini case demonstrates how both the discursive production of scarce of pristine natures and the purportedly appropriate/accurate valuation of nature by the ecotourism economy (or other supposed forms of sustainable development) can simultaneously perpetrate the *devaluation* of actually existing peasant abundance.

Aquaculture and the environment-making state

The suspension of the port project justifies celebration among local and regional environmentalists, humanitarians, rabble rousers, tourism operators, government forestry officers invested in the estuary's expanding mangrove cover and, foremost, the thousands of peasant fishers, farmers and foresters who depend on the estuary's ecological health for their (re)production. **Chapters 2** and **3** of this dissertation specifically estuary as a political ecology that can support its own organized defense. And the state industrial agency's subsequent embrace of conservation-focused tourism economy — though hardly a

guarantee of sustainability or social/environmental justice — also provides additional hope, at least for some, that the estuary might avoid wholesale sacrifice in the name of the Blue Economy and national development. While hotels and resort development now promoted by the state will certainly generate their own attendant but less obvious problems, the shipping port's devastation — clearcutting and infilling mangrove swamps, dredging shallow oyster beds, ruining water quality and displacing thousands of households and the like — would be far more certain, rapid and complete, while offering far less opportunity for political/democratic engagement and deliberation than the ecotourism turn.

Of course, neither capital nor the state is unitary, and different fractions/factions of both also continue to pursue projects, plans and profits not strictly aligned with future ecotourist ambitions. Even the ten or so miles of cycling from my NGO field station to the river's edge and back took me past other creeping "developments" potentially quite contradictory to any vision of an economy dominated by an ecologically sensitive tourism industry.

Most prominently, a years-long state government effort to harden and expand *bunds* and dikes in estuaries throughout Uttara Kannada District had finally reached the Aghanashini shores during my visit. As I watched during breaks in my ride, multiple construction crews operating crawler excavators dumped truckloads of red laterite soils and stone boulders at the river's edge, widening embankments and the dirt/gravel roads atop. The official goal of protecting small-holder lands from saltwater intrusion is a potential boon for households whose lands have not been salinized, though embankment expansion offers few if any advantages for cultivators of traditional *gajni* plots and other periodically inundated lowlands. A state government minister, however, was blunt about larger economic justifications for the project's cost of 300 crore rupees / $35 million: "Land can be reclaimed which helps in agricultural activities and taking up of prawn cultivation" (Mohammed 2021). Indeed, the largest beneficiaries will be the industrial aquaculture projects are scattered around the estuary that operate in the capitalist export economy of wage labor gangs, bulk commodity sales agreements, investor-owners, murky environmental regulation, routine pollution and potentially large short-term profits. State spending on embankment/road construction then directly subsidizes commodity fish and shrimp farmers by providing security from the river, while also enticing additional "improved" production through marginally better roadways for quickly getting harvests into cold storage for export.

Commodity aquaculture, however, is hardly new to coastal India, including the Aghanashini. From the late Victorian period, colonial administrators especially in South India would increasingly see the potential for capitalist fish farming in the supposed wasted lands of estuaries and backwaters (Jadhav 2022), a discourse that repeated in Independent India's developmentalism. The Aghanashini, as elsewhere, saw aquaculture boom during the 1980s under India's centrally planned "*Neel Kranti* / Blue Revolution project that established a network of Fish Farmer Development Agencies nationally and provided training, loans and inputs for upgrading wetlands traditionally used for small-scale fishing, fish ranching or cultivating salt-tolerant rice. This 1980s prawn boom

eventually busted in the 1990s as intensely used ponds became polluted, diseased and abandoned; some of those only to rise again, zombie-like in the contemporary aquaculture boom of India's Blue Economy. However, the demands of fish feed (made of other caught fish) and the liquified waste created by millions of swimming organisms make industrial aquaculture a dubious proposition ecologically. **Chapter 4** of this dissertation describes this trend in more detail and explores how dreams of a fantastic, limitless fish production have generated actually existing unsustainability and the colonization of coastal wetlands.

From reading even the limited history narrated in this dissertation, I argue that the contemporary recurrence of aquaculture across India reproduces, and relies in large measure upon, the recurrence of logics and practices to "improve" nature and its productivity by the developmentalist, environment-making (if today neoliberal) state (Drayton 2000; Harvey 2005; Li 2007; Parenti 2015). Whether in Francis Buchanan's early 19th century tour of the East India Company's expanded claims in South India[4] or James Hornell's surveys of 20th century Madras Presidency or Independent India's technoeconomic and resource accountings, the surveillance of social ecology, categories of landcover and systems of production has been standard procedure for states (company, crown or independent) for their biopolitical management and development of territory. The story the Aghanashini estuary provides me a prism through which to view the multiple and even contradictory fractions of the state and its development project over time. In this analysis, today's government expansion of embankment "infrastructure" appears rather plainly as a neo/internal colonial attempt to secure the development of specific forms of capitalism in geographies (i.e. estuarine backwaters) the state has long considered un/underproductive.

Further reflecting a colonial approach to the transformation of space, the aquaculture promoted and protected by the state will threatens to supplant an already existing peasant ecology and economy (one that the state and capital have already discursively and materially devalued). Note that the Karnataka Minor Irrigation Department overseeing the construction has also refused to perform any environmental impact assessment, denying any threat to estuarine ecology. Never mind that at various stops along my cycle trip, I watched as crews intently dumped soil in and around mangrove patches to expand the embankments, (see **Figure 6.2**), a direct violation of state and central government protections. In other words, land reclamation is de facto mangrove deforestation. Local scientists and environmentalists have also warned publicly that even when mangrove ecologies aren't immediately destroyed, bund construction will have multiple, cascading consequences that threaten the long-term health of the estuary's ecosystem values (estimates of which form the basis for **Chapter 5**). Mangrove plantation has been a historical tactic of estuarine households to strengthen and maintain river embankments, generally, but the lateritic clay soils used to block water infiltration offer poor soil for these state-protected habitats to even reproduce themselves. Without mangrove stands as an additional shield for the embankments, the dumped clay soils will erode even faster; in other words, construction that removes vegetation may paradoxically weaken the

[4] Buchanan's description of estuary — "abounds with fine oysters" — marks an early if not the first colonial recognition of the productivity and vibrant ecology of the Aghanashini's backwaters (1807).

embankments rather than strengthen them. Clay soil erosion will also cloud the river and reduce the water quality needed by farmers, fishers and saltpanners. Clay embankments without vegetation also can "glaze," speeding water flows, deepening the channel and further disrupting estuary life — including that of small-scale fishers — who rely on a wide, slow river.



***Figure 2** — Aghanashini estuary mangroves destroyed by embankment construction in February 2023. Author photograph.*

Can the future be abundant?

In my analysis, ecotourism and aquaculture represent two possible visions of the future of the Aghanashini River Estuary. As contemporary modes and means of development, both already exist in the estuary, though more speculative than established. If developed to the fullest extent imagined by their acolytes, each could become a coast-wide industry of property developers, specialized trades, manufacturers, owner-operators, contractors, maintenance/repair teams, conglomerates, subsidiaries, nested circuits of capital/finance, labor pools/reserves, training systems, dedicated state bureaucracies, regulatory regimes, supply chains, salespeople, advertising agencies, trade agreements, export zones, international governing bodies and more. In practical terms, boosters are dreaming — often subconsciously, sometimes in nightmare — of all the "developments" that might be required such that one day a tourist couple from Mumbai might arrive in Goa by charter helicopter before transferring to a high-speed catamaran for the ocean journey to the Aghanashini River mouth, where they could paddle injection molded plastic kayaks designed in the shape of a traditional Aghanashini canoe to reach their stilt-suspended wooden cabanas with immersive views of only mangroves and kingfishers (e.g. **Figures 6.3** and **6.4**).[5]

[5] A company in Mumbai already offers the helicopter portion of this would-be future.



Figure 6.3 *— In the core of the estuary, mangrove swamps lure both tourists seeking nature and capitalists seeking tourists. Author photograph.*



Figure 6.4 *— Though named the "common kingfisher," these birds form part of the estuary's natural spectacle. Author photograph.*

Ecotourism and aquaculture development in the estuary already have their casts of public and private actors who take on roles that promote, plan, justify, enact, monitor, critique, defend and, importantly, resist plans and projects. Some of these characters appear have

already appeared in my dissertation — even in this chapter — while others wait in the wings or far removed. One is PCF's founder, who once hired a nominal Marxist to run his NGO but has since become an evangelist for ecotourism through property investments and funded social enterprises. "Only ecotourism can save this place," he told me once as we stood on the banks of the river, and he has bet millions of rupees on his position. Another cast member would be the state official, who stands in the way of environmental impact assessment and argues embankment construction poses no risk to ecology.

The arrival of nascent ecotourism and the return of industrial aquaculture herald a potentially changed future in the estuary. How, how fast and to what extent will either mode of development might alter, preserve, improve, degrade, sacrifice or transform the (wet)landscape? Those remain open-ended questions both analytically and politically, as long as the telos of agrarian transition to capitalism is not hegemonic or inviolable in politics, policy and scholarship. In other words, nothing I have described about a future industrial economy based on nature tourists or fish farming has yet sealed the fate of the estuary's abundance or its peasant ecology and economy. Put still another way, the "agrarian question" in this place — asking after the politics, health, place, desires and needs of/for Aghanashini River estuary's peasantry in relation to the globalized capitalist economy — is very much alive and well.

My dissertation attempts to ask the contemporary agrarian (or perhaps estuarine) question in the Aghanashini River estuary and along the coast of India. My answers, spread across four chapters with different methods, empirics and analyses, point to what I argue is an actually existing subsistence ecology and economy that, far from being marginal, yields an agrarian abundance beyond what merchant or industrial capitalist recognizes or can commodify. I name the producers of this abundance "peasants," not the least for their persistence in subsistence (re)production as well as their skepticism of and only partial participation in the market economy. This robust non-market productivity broadly generates relative comfort and households report satisfaction with lifestyles and standards of living despite below-the-poverty-line money incomes, defying external and elite narratives about rural coastal desperation and the need for large-scale development intervention. This peasant economy and ecology of course are dynamic systems of agrarian production that develop unevenly and unequally alongside and in relation to forms of social and economic differentiation and transformation; how the peasantry is fractured or maintained and for whose benefit remain viable and critical questions today in the face of global, neoliberal capitalism's "sustained attack on peasant-owned or -occupied land in the name of "development" (Patnaik, Moyo and Shivji 2011).

I have also argued that the estuary's agrarian abundance generates and supports politics in its own defense, seen in the history of Aghanashini communities refusing destructive development or sacrifice. At points in the dissertation, I have also gestured to threats, unsustainabilities, contradictions and injustices both internal and external. Even if it remains relatively peripheral to global hubs of capitalist political economy like Mumbai or Bangalore, the estuary is by no means hidden from the eyes and ears (and hands) of market forces. Ecotourists today bring demand for service from all points of India and the globe (often seeking reprieve from the hyper-developed beach scenes elsewhere), while estuary

products able to command good prices — e.g. cashews or crabs, from both industrial and peasant producers — will be exported to major Indian cities or even internationally. As I have argued strenuously in this dissertation, the estuary is *not* a place outside the time-space of capitalism in India, especially that of today's vogue Blue Economy.

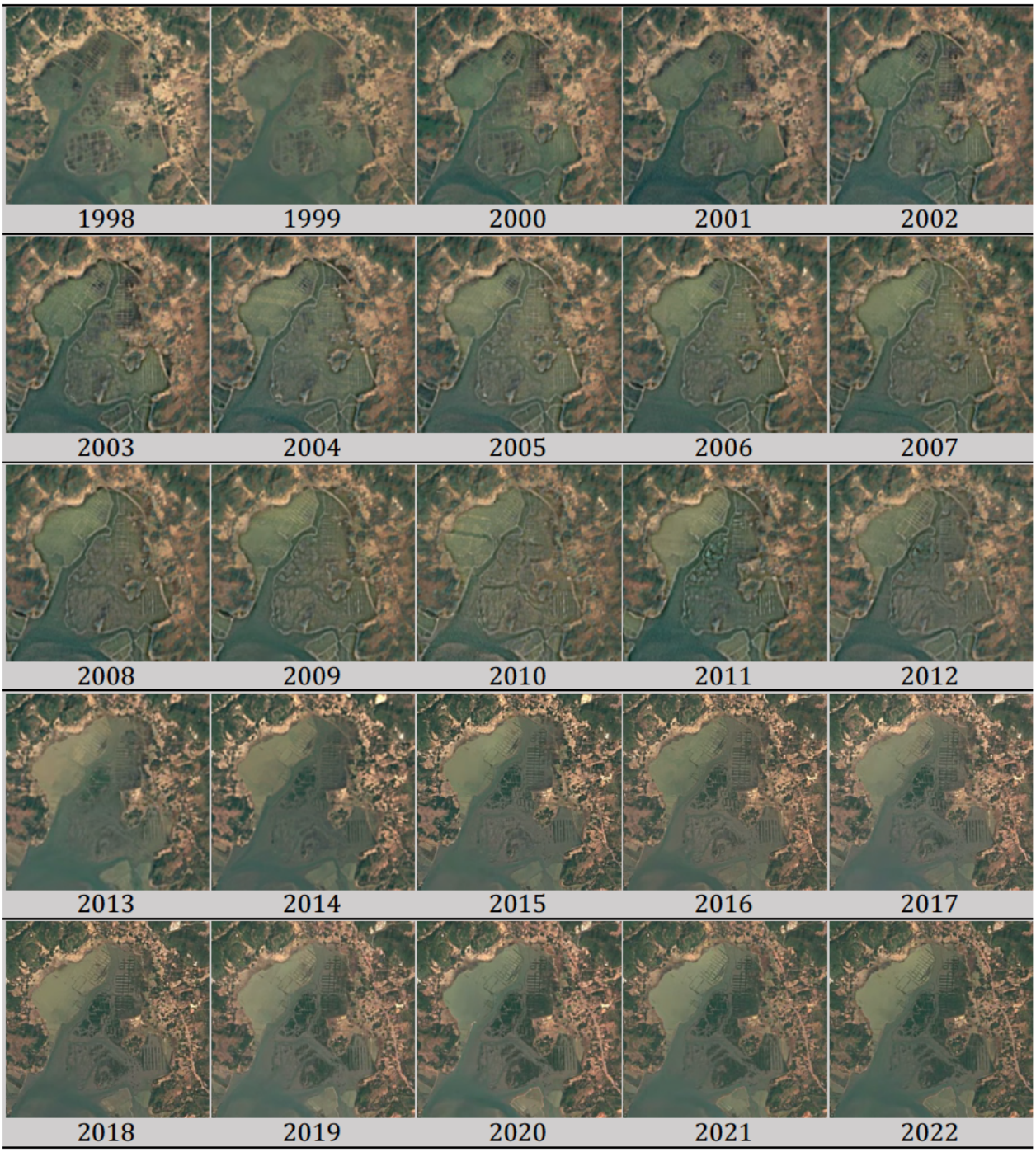
The tide of capitalism is clearly washing in, whether through ecotourism, aquaculture or just the slow creep of commodity trade and money demands. Already extant climate change will intensify, increasing pressures on agrarian ecologies and economies dependent on the South Asian monsoon.[6] To date, however, the Aghanashini estuary has largely defied trends across much of coastal India of multivariate agrarian crises of reproduction. As with other modes of development, however, we can and should ask: Is this peasant ecology and economy actually sustainable? Put a different way, what might be (or remain) the foundation for an abundant future in the estuary? Below, I offer attempts at an answer.

First, the estuary's own ecology has provided something of a response. Simply put, since I left in 2016, mangrove habitat in the estuary has exploded, thanks in part to afforestation and sapling planting efforts since the 2000s by a partnership of local civil society, the state forest department and volunteer fishers and farmers. Despite their nationally and globally threatened status, mangroves create generally robust habitat (capable of withstanding typhoons). Indian environmental law makes their cutting or uprooting strictly illegal, and in the absence of immediate dangers and, left to their own devices, Aghanashini mangroves are having a practical growth spurt, one easily detected by satellite. Annual composite satellite imagery for 25 years (**Table 6.1**) shows the steady colonization of central backwaters by mangroves and their associates. A basic remote-sensing analysis of landcover change across the estuary (building on valuations reported in **Chapter 5**) is a target for ongoing collaboration, but even visual inspection confirms substantial growth. **Figure 6.5** provides side-by-side comparison of the most dramatic growth between 2016 and 2022; in scene shown, mangrove cover has increased at least sevenfold according to a first-pass analysis of changed reflectance.

Table 6.1 — Annual expansion of mangroves (dark green surrounded by water) in the Aghanashini River estuary

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[6] Considering its importance and looming impacts to agrarian production in India, climate change appears downplayed or muted in this dissertation. That reflects in large measure the concerns and ambitions of estuary residents themselves. Certainly PCF met no climate change deniers, and many residents did suggest that mangrove afforestation will protect against increased storms. But few agrarian producers in an estuary took time to worry about the climate with us. It only rarely came up in conversations about household needs or development priorities and *never* as a top priority. That will not remain so going forward as more geographies feel the effects more acutely. More erratic rainfall, dessicated landscapes and an ever-more-mercurial monsoon are all in the long-term forecast because of global greenhouse gas emissions and fossil fuel capitalism. Future scholarship, planning and politics up and down the coast — whether by NGOS, the state, capital or just estuarine households — must better prepare for the chaos, disruption and hardship to come.



Each picture is an annual composite — the average of reflectance across a year's worth cloud-free satellite imagery. Data from Airbus; processing and cloud-free compositing by Google. For more information visit earth.google.com.



Figure 6.5 *— Expansion of mangroves (dark green) from 2016 to 2022 in the center of Aghanashini's backwaters. Data from Airbus; processing/compositing by Google. For more information visit earth.google.com.*

Afforestation work in the estuary does have critics, especially among households who have seen mangrove expansion block the sea breeze to their village, trespass into their rice paddy or cut off their closest access to the river. Some local proponents of the shipping port also openly accused environmentalists and the state forest department of using the expansion of mangroves as an excuse block desired development. I have no interest in uncritically valorizing any ecology, much less plantation projects in the abstract, but these critical habitats do provide, control or underpin aspects of estuary life and livelihood more than any other — by filtering water, buffering storms, supporting fisheries and more — as well as serving as important cultural (and political) ecologies bound up in religious and community traditions and identity (**Chapter 4** offers more details; see also Chandran et al. 2012; Mesta et al. 2014; Stone, Bhat and Bhatta 2008); PCF's own research also found that households recognize mangroves as the source of dozens of benefits for themselves or their neighbors and are willing to volunteer at least minimally to conserve the habitats (Jadhav 2017). IN short, though not an unqualified good, Aghanashini mangroves represent and support production of agrarian abundance, one that stand out from India's increasingly disturbed and degraded coastal landscapes as an exemplar of what is possible.

Second, the large majority of households who depend heavily on the region's robust peasant ecology and economy for their basic reproduction — and more or less told PCF they like it that way — simultaneously represent a constituency vested in the estuary's longer-term health. This "political society" (cf. Chatterjee 2008) offers the possibility of and basis for institutional environmental protection and/or adaptive environmental management, through bottom-up, peasant-led or even democratic means. Here, the estuary's history of self-defending its abundance and resisting destructive development is not only a narrative but a resource; experiential knowledge, collective memory and political muscle all serve as the basis for future political praxis. The successful blockage of the port, for example, relied on *local* political know-how and interests, even if regional civil society groups and scientists assisted and supported. When a Karnataka state minister finally announced the death of the port in 2023, he was explicit that the project was "abandoned due to resistance from the *local* people" (Deccan Chronicle). Political memory around the estuary is also intergenerational, in some cases reaching all the way to the late colonial period when the region's restive peasantry found various ways to harass and haze British rulers (**Chapter 2**; see also Naik 2014). The estuary's abundance itself enables socialized, defensive politics in two additional ways: In so far as it makes the lives of peasant families materially better, the estuary's ecology and economy necessarily provide households with time, space and capacity for political thinking and actions beyond pursuing simple reproduction (**Chapter 3**). Additionally, the peasant farming, fishing and forestry practices that produce the estuary's abundance simultaneously teach and reinforce social relations that add to the political toolkit (for better or for worse).

Third, the Aghanashini estuary actually exists in a wider supportive institutional landscape. Several decades of science by ecologists and attention from conservationists have produced volumes of data and evidence concerning the estuary's health along with an epistemic community spread across universities, NGOs and even state agencies. In this regard, the estuary is already a well-known entity. Multiple categories of environmental protection already exist in Indian environmental law — national park, national sanctuary, conservation reserve, community reserve, ecologically sensitive area, critical vulnerable coastal area among others — that could be creatively applied to creatively manage the estuary. Certainly, none is perfect; some are paper thin or unspecified; others actually have teeth but might confuse traditional forest users for poachers; still others prioritize consumers and capitalists (e.g. via ecotourism); many also rely/repeat (neo/internal)colonial logics about state authority. Which one(s) if any could be utilized in the Aghanashini and by/for whom are trenchant analytical and political questions best answered through the deliberation and participation of communities themselves. But this possibility of peasant fishers, farmers and foresters collectively organizing environmental or development regulations should not be dismissed as merely fanciful or romantic. In early 2024, the Indian central government formally named the estuary a Wetland of International Importance under the United Nations Ramsar Convention, an act that was the result of decades of environmental campaigning by that aforementioned epistemic community. Though a symbolic gesture full of uncertainty, state recognition of the estuary's ecological significance creates potential terrain to organize and politicize for something more meaningful or even emancipatory (Sirur 2024).

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