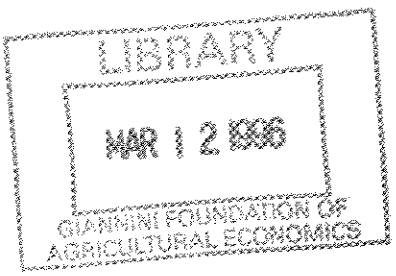
DEPARTMENT OF AGRICULTURAL AND RESOURCE ECONOMICS
DIVISION OF AGRICULTURE AND NATURAL RESOURCES
UNIVERSITY OF CALIFORNIA AT BERKELEY

WORKING PAPER NO. 782

AGRICULTURAL AND RURAL EMPLOYMENT IN BULGARIA, 1989 AND 1994

by

Philip Kostov, Kirby Moulton, Allan Buckwell and Sofia Davidova



California Agricultural Experiment Station
Giannini Foundation of Agricultural Economics
February 1996

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Philip Kostov
Economist, Agricultural Policy Analysis Unit
Ministry of Agriculture, Bulgaria

Kirby Moulton
Economist, University of California, Berkeley

Allan Buckwell
Professor, Wye College of London University

Sofia Davidova
Lecturer, Wye College of London University and
Professor, Research Institute for Agricultural Economics, Sofia

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Introduction

Sharp drops in employment have characterized the economic transition occurring in Central and Eastern Europe. Their persistence has been a surprise to those who anticipated rapid economic recovery (Milanovic). The situation in Bulgaria echoes that in other countries and is of political concern because of its impact on people and the country's well being. The symptoms are well known (NSI). Overall employment dropped by 28 percent between 1989 and 1994, and agricultural employment declined by 13 percent. The principal reasons for these reductions are the abrupt decline in production and the restructuring of Bulgaria's economy. But there are offsetting factors, such as technological changes, that have slowed the employment loss. An understanding of the dynamics of unemployment is needed if remedial strategies are to be developed.

The research reported here adds a component to the extensive review of Bulgaria's agricultural transition by Schmitz et al. Its focus is on rural employment and its relation to agriculture. Non-agricultural employment fell more rapidly than agricultural employment but the impact of this on rural areas is not well understood. Agricultural employment declined less rapidly than did production, suggesting a shift in technology and the emergence of under-employment. There is inadequate information about which groups have been most affected or what has happened to the people. National data provides only a partial picture of this situation and therefore is an inadequate base for public policy choices. Further, there is the question raised by Bartholdy about the ability of data systems to retain accuracy during a period of fundamental change to a country's economic system. The problem is how to obtain sufficient information about rural employment to permit better policy choices to be made.

Two approaches have been followed to improve the data base for policy decisions. The first approach involves comparing agricultural employment with scientifically determined labor requirements for agricultural production. This permits measurement at the national level of how the surplus of agricultural labor

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[1] The research reported in this paper was presented at the workshop "Issues for Agriculture in Bulgaria," Research Institute for Agricultural Economics, Sofia, 21 September 1995. The research results from collaboration between a USIA University Affiliations Project and the Agricultural Policy Program of the EU PHARE Project. The details of this research are to be published in a subsequent report. The authors wish to thank Margarita Mihailova for her contributions to this paper.

changed between 1989 and 1994. The result helps in isolating the impact of output changes on employment from technology and other changes, and helps identify the size and character of the agricultural labor pool. It also permits an estimation of the impact of future changes in productivity and production patterns. The second approach uses local data, obtained through a survey of village households and cooperatives, to provide information about rural employment that is not available from existing national data. It helps determine how rural households, enterprises, and communities have been affected by production and employment changes and how they might be helped. The village survey, conducted in the Summer of 1995, provided unique data that are being reported here for the first time.

Past Studies

The problems and policy implications of unemployment in Central and Eastern Europe have been studied extensively, primarily at the aggregate rather than sectoral level (Barr, Jackson, Burda). Some studies focus principally on policy or statistical issues (World Bank, Bartholdy). Important attention has been given to the dynamics of unemployment, including its persistence, and the flow between vacancies, unemployment and jobs. These studies examine policy implications of changes in productivity, real wages, employment and labor force participation rates (Raiser, Boeri, Blanchard). Other studies have emphasized the link between unemployment, income, and poverty (Milanova, Sotsiologicheski, Karp). Relatively few studies have focused on Bulgaria and they tend not to emphasize agricultural and rural employment (Rock, Barzaski, Bobeva). The European Union study briefly analyzed the agricultural labor situation, using national statistics to comment on labor inefficiency. Mihailova computed national agricultural labor requirements using norms developed through studies of agricultural production processes. Sotsiologicheski Pregled, in a special issue, provided an overview of poverty, unemployment, and social policy as it affected rural and urban areas in Bulgaria.

Theory

The practical problem of evaluating the employment situation in Bulgaria is tremendously difficult. Rock lists 8 external and 5 internal factors affecting employment in Bulgaria, and concludes that transition has been hindered by an enormous number of external and internal constraints. Boeri commented that "*conventional wisdom does not seem to offer many clues to the factors lying behind the dynamics of unemployment in CEEC.*" Just the same, theory offers a framework for classifying the variables influencing labor demand and can be helpful in guiding the way through the complex network of cause and effect. The demand for agricultural labor is a function of output (or expected output), wages, other input costs, and the structure of agriculture. Supply is a function of wages, opportunity

costs (wages in other activities or the value of leisure), population, and the institutional structure within which decisions are made. Employment changes in Bulgaria, as in the rest of central and eastern Europe, have been caused by reductions in labor demand rather than reductions in its supply. It is postulated that three major factors have contributed to the observed changes in agricultural employment. First, output of agricultural produce has fallen because both domestic and foreign demand has fallen. Second, labor has become cheaper relative to other inputs and stimulates the use of more labor intensive technology. The third factor is the restructuring of agriculture through the privatization of land and the liquidation of collective farms that affects both technology and output.

Both domestic and foreign agricultural demand have contracted, causing the agricultural demand curve to shift to the left. Given the generally inelastic nature of agricultural demand, prices would have had to drop precipitously to maintain the same volume of demand. Other factors shifted the aggregate agricultural supply curve, shifting it upwards and to the left. These included the increase in input costs relative to output prices and the disruptive effects of farm restructuring. The net effect of these shifts was that output declined, the real value of output dropped, and agriculture's contribution to GDP fell. Since the focus here is on labor demand, the shifts in agricultural demand and supply are taken as exogenous.

The effects of the change in wages relative to other input costs can be analyzed in the standard neoclassical two-factor model in which the demand for labor and capital depends on their relative values, w/r, and on the level of output, Q. The pre-reform level of labor and capital usage depended on these factors, which in turn were influenced by technology and by various policy interventions. Post-reform there are at least 3 shocks to the system. The first is the drop in output caused by demand and supply shifts and agricultural restructuring. This shifts the "Q" isoquant in the model inwards (i.e., the same w/r value will produce a lower requirement for labor and capital). Because of technology changes, the new isoquant may not be based on the same production function as in the pre-reform period. Second, the stock of capital is diminished because of deferred maintenance and the resulting accelerated depreciation and non-renewal of obsolete assets. The third change is the fall in the relative cost of labor. The first factor can be neutral, although in Bulgaria it is evident that restructuring has caused a change in technology usage. The second and third factors favor the substitution of labor for capital. To the extent that there is a rational economic response to the new w/r value and the output level, Q, then more labor will be used relative to capital than was the pre-reform case. This phenomena is investigated by comparing changes in agricultural labor requirements with shifts in agricultural employment.

Restructuring refers to a complex mix of changes in farm land ownership and organizational relationships used in operating farms. The outcome of restructuring by the end of 1994 was a mixture of smaller cooperatives, large scale farming companies, private partnerships, and family farms. The essence of restructuring is that it creates enterprises with different mixes of management skills, technology,

resource mix, and objectives. These, in turn, lead to different outcomes in the factor ratios employed and the level of productivity. The balance between labor shedding by the more commercially operated farms versus the labor absorption of the more numerous, labor-intensive family farms will depend on the relative numbers in each of these categories.

This report makes no attempt to isolate the impact of restructuring on labor demand, but rather concentrates on measuring the impacts of output and technology changes. Since the explicit nature of technology in 1994 could only be inferred in the absence of updated studies on production labor requirements, the effects of output and technology were estimated according to the following model.

The ratio of agricultural employment to agricultural labor requirements in 1989 is considered the measure of pre-reform agricultural technology. This measure is multiplied by labor requirements calculated for 1994 and provides an estimate of what employment would have been in 1994 if technology had not changed between 1994 and 1989. The difference between this number and employment in 1989 is the loss in employment caused by the decline in output. The difference between this number and actual employment in 1994 is a measure of employment change created by technology and other changes.

Technology in 1989	=	$T_{89} = E_{89}/\Sigma N_{89}Q_{89}$
Projected employment, 1994	=	$E'_{94} = T_{89}\ \Sigma N_{89}Q_{94}$
Output effect	=	$E_{89} - E'_{94}$
Technical effect	=	$E_{94} - E'_{94}$

where:

E = employment; N = normative labor requirements for agricultural production; Q = agricultural output; E' = projected employment; and Σ = summation of individual agricultural products.

Agricultural Employment Changes from National Level Data

This section first analyzes national employment trends and then examines the relationship between agricultural employment and estimated labor requirements. Each discussion begins by defining essential terms or activities and then presents the results of our analysis.

Employment. The national employment data used here reports all persons carrying out certain activities in public and private enterprises and receiving

payments or income. The amount of work performed is not specified. The data exclude work performed by students, army, or others in agricultural brigades prior to reform.[2] This was predominately for harvest. Consequently, the employment figure for 1989 understates the number of people actually performing agricultural work while the data for 1994 are more nearly correct with respect to harvesting. The data also exclude labor performed on private plots, even if some of the resulting products were sold on the market.

Agricultural production in Bulgaria dropped by an estimated 29 percent between 1989 and 1994, more than double the rate of decline in agricultural employment (Table 1). Agricultural labor requirements, as discussed in the following section, declined at an even faster rate of 38 percent. The differential between these 3 rates indicates clearly that more labor was used per unit of output in 1994 than was the case in 1989. How can this be explained?

First the production structure in Bulgarian agriculture has changed resulting in different scales of operation and probably more labor intensive technology. Although some case studies indicate that new specialized farm organizations can obtain greater yields and use less labor,[3] the average of Bulgarian agriculture in 1994 was more labor intensive than before. Secondly, the non-availability of student and military help after 1989 had to be offset by employed labor in 1994. Consequently, employment could not shrink as rapidly as output.

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[2] We estimate that labor from brigades supplied the equivalent of 50,417 man years of work in 1989 and assumed that all of this was applied to fruit and vegetable crops, mostly during harvest. This work amounted to 23.5% of labor requirements for those crops and 7.4% of the estimated labor requirements for all crops and livestock, including a 5% addition for supervision.

[3] Kopeva, D. "Classification of farm categories in Bulgarian agriculture," Working Paper, PHARE Project 94/2.

Table 1. Employment, Output and Agricultural Labor Requirements.

	1989	1994	Change %
Employment			
Agricultural	789,093	684,200	-13.29
Non-agricultural	3,575,941	2,473,692	-30.82
Total	4,365,034	3,157,892	-27.65
Output Index			
Gross Agricultural[a]	100	71.2	-28.80
Gross Crops	100	80.0	-20.00
Gross Livestock	100	57.0	-43.00
Labor Requirements (FTE)[b]			
Crops	492,347	328,977	-33.18
Livestock	186,068	92,898	-50.07
Total	678,415	421,875	-37.81

[a] through September 1994.
[b] 240 man-days per year including 5% required for supervision; adjusted to cover all crops and livestock.

Sources: Employment: National Statistics Institute of Bulgaria, Statistical Yearbook, various years.
Output Index: National Statistics Institute, Special data run for Ministry of Agriculture Report to OECD.
Labor Requirements: Mihailova, M. "Estimation of Theoretical Requirements Labour Inputs in Bulgarian Agriculture," Agricultural Policy Analysis Unit, Ministry of Agriculture, Working Paper, August 1995. (Adjusted to account for non-covered crops.)

Labor Requirements.[4] Normatives are labor inputs measured in number of workers or time needed to complete component parts of some agricultural process. Norms are the summation of labor inputs needed to complete a determined volume of work or to produce a defined quantity of product under specific conditions. The calculations of normatives and norms are based on careful observation and analysis of labor-using activities. Those used here were developed or compiled by the Research Institute for Agricultural Economics from observations made throughout the country. With knowledge of the technology applied and the output achieved, one can use norms to estimate how much labor would be required in producing that output under perfectly efficient conditions.

Normatives and norms evaluate the important factors in plant and animal breeding. In plant breeding, these include technical, organizational, agricultural, biological, physiological, hygienic, and natural factors. In animal breeding the

[4] This section is derived from the analysis reported in Mihailova, Margarita, "Estimation of Theoretical Requirements for Labour Inputs in Bulgarian Agriculture, Based on Normative Data," Agricultural Policy Analysis Unit, Ministry of Agriculture, Working Paper, August, 1995.

factors include the kind, purpose, and productivity of animals, the quantity and quality of fodder, and the type and characteristics of equipment, machinery, and buildings.

The limitations on the use of norms to calculate national agricultural labor requirements include the following.

- Norms are available for some, not for all products produced in Bulgaria; a larger proportion of crops were covered by norms in 1994 than in 1989. We have corrected for this through assumptions described elsewhere.

- The normative data reflect the production characteristics that existed during the central planning system when large farms and equipment predominated. Currently, observations are being made of processes characteristic of the new farm structure with smaller farms, machines and equipment with less size and capacity, and smaller animal herds. Changes were made in a few norms based on observations made in 1992, but the bulk of the updating has not been completed.

- Because the objectives of labor input norms require them to reflect concrete conditions, they lose some precision when aggregated because these conditions are rarely homogeneous across agriculture. Thus there will be a wider range of error in national labor estimates than in localized estimates.

Despite these limitations, the normative approach provides a useful way of measuring change and describing relationships in the agricultural labor situation. We have used the approach to define labor "surplus" and to investigate the impact of changes in agricultural productivity and production patterns.

We define labor surplus as the difference between the number of people employed in agriculture and the number theoretically required, given the level of output. It is a measure of the number of people used to accomplish tasks that could be done by fewer. Calculations of this surplus and the various ways of describing it are presented in Table 2. The surplus in 1994 was 38 percent of employment, almost double the level in 1989. The 1989 level was probably close to full employment, since "extra" labor was needed for the inevitable downtime, preparation time, and inefficiencies in agriculture. We estimate that army and student brigades provided about 50,000 man years of labor in 1989, mostly during harvest. Thus less work was available for employed persons and the surplus was higher, at 14 percent, than it would have been in the absence of work by the brigades.

Table. 2 Agricultural Employment and Labor Requirements.

	1989	1994	-------change------- numbers	%
Agricultural employment	789,093	684,200	–104,893	–13.29
Labor requirements	627,998[a]	421,875	–256,650[b]	–32.83
Difference	161,095	262,325	101,248	62.85
% of employment	20.42	38.34		
ratio	1.26	1.62		29.08
Man-days per employee[c]	191	148	–43	–22.53

[a] The labor requirement calculated from norms in 678,415 persons. This requirement has been reduced by the estimated amount of labor provided by brigades in 1989, 50,417 man-years. Thus the net requirement to be compared with the number of employed persons is 627,998.

[b] This is the difference between normative labor requirement, not adjusted for inputs by agricultural brigades. It reflects the impact of changed output and technology.

c Calculated as 240 days divided by ratio of employment to requirements.

Source: Table 1, supra.

We calculated the average number of days worked per year by employed persons by multiplying 240 days per year by the ratio of labor required to persons employed. The number of days worked per year dropped from 191 in 1989, after adjusting for work provided by brigades, to 148 days in 1994. The relative drop would have been greater if the employee work had not been displaced by brigades in 1989. These data show clearly that the surplus of labor in agriculture increased and that the existing work force is, on average, a part-time work force.

The difference in agricultural labor requirements calculated for 1989 and 1994 reflect three important changes: (1) a significant drop in agricultural production; (2) an important shift toward more labor intensive practices; and (3) a decline in the average number of days per year worked by those employed. We have analyzed these changes by assuming that the technical relationship in 1989 between the number of persons employed and the amount of labor required would apply in 1994. This implies no change in technology between the two years and indicates what 1994 employment would have been under that condition (Table 3).

The difference between that theoretical employment level and the actual 1989 level is 257,531 persons and would have been the employment lost due to reduced output if technology had not changed. However, the actual drop in employment was 104,893 persons and this means that technology changed toward a higher rate of labor utilization and that persons were employed, on average, for fewer days per year. This change offset part of the loss caused by lower output and increased employment by 152,638 persons beyond what it would have been. Thus as technology returns to or beyond its 1989 level, we would expect that employment would be reduced by at least 153,000 persons, or 22 percent of 1994 employment. The need then would be to expand agricultural production sufficiently to absorb these displaced workers, in addition to those displaced by lower production. This implies an output growth of approximately 50 percent.

Table 3. Influence of Technology Changes on Employment.

1. Agricultural Employment in 1989.	789,093
2. Labor required in 1994 using 1989 technology.	421,875
3. Employment multiplier, 1989.	1.26
4. Projected employment, 1994 using 1989 technology *(#2X3)*.	531,563
5. Actual employment, 1994.	684,200
6. Employment retained due to technical change and fewer work-days per year *(#5–4)*.	152,637
7. Employment lost, 1989 to 1994 *(#1–5)*.	104,093
8. Projected employment loss, 1989-1994, if technology and work days had not changed *(#1–4)*.	257,530

Source: Calculated from Table 2, supra.

We have also examined the possibilities that agriculture can re-absorb this surplus labor by projecting labor requirements based on increasing yields from all crops (Table 4). One may notice that even a doubling of yields will increase labor requirements by only by 35.6 percent. This would increase average man days worked per year to slightly above the level of 1989 but still below full-time employment. The assumption of doubling yields seems unreasonable, at least in the short term, and is not viewed as a likely remedy to under employment.

Product mix changes are more likely to increase the total amount of labor used in agriculture. The shift away from labor intensive crops between 1989 and 1994 contributed to the employment problem. The areas devoted to oriental tobacco dropped by two-thirds, to Virginia tobacco by one-half and to sugar beets by four-fifths. Perhaps only potatoes increased in area. Thus labor requirements were cut during the period and, in the same way, they could be expanded in the future if

cropping returned toward former patterns. For example, if we were able to replace 200,000 decares of barley with oriental tobacco, labor requirements would increase by 15.91%. However, this shift is unlikely because barley and tobacco growing areas are not directly substitutable. A more likely shift would be from potatoes instead of barley, and this would augment labor requirement by just about 10 percent. Consequently, a feasible shift toward more labor intensive crops would help in absorbing surplus labor but would not resolve the employment problem

Table 4. Relationship between Changes in Average Crop Yields and Labor Required, Bulgaria, 1992.

-------percent of change in--------	
yield	labor requirements
10	3.56
20	7.11
30	10.67
40	14.23
50	17.79
60	21.34
70	24.90
80	28.46
90	32.01
100	35.57
110	39.13
120	42.69
130	46.24
140	49.80
150	53.36

Source: Calculated from Mihailova, M., op cit. (Table 1).

Agricultural Employment Changes from a Sample of 10 Villages

A survey of agricultural production and labor uses was carried out in ten villages selected from the ten administrative regions of Bulgaria during the Summer of 1995. The survey design was based on experience gained in a pilot study conducted earlier in a representative village. Survey questions were grouped in four types of questionnaires. Questionnaire A sought general information about the village: population, employment, principal agricultural activities and main agricultural products. This information was taken from the mayors' offices. Questionnaires B and C were destined respectively for the former collective farms and new cooperatives. Questionnaire D was used for obtaining information from the households. Questions, asked in the last three types of questionnaires were about the crop and livestock production, cultivated area, and labor input.

The survey data reflected national trends in many respects thus indicating that inferences drawn from the survey might reasonably be applied at the national level. Cropping patterns from the survey are similar to the national pattern with the survey having a slightly lower share of field crops and slightly larger share of fruits and vegetables. The differences are within 2 percentage points. Village data on agricultural employment (in-village and out-of-village) follows a similar trend to national data. The drop in agricultural employment between 1989 and 1994 was 14.3% in the surveyed villages and 13.3% nationally. The average yields from the survey correspond to those from the national statistics, except for orchard crops. The survey shows an increase of the cultivated land, as does the national data. Both survey data and national statistics show a similar drop in non-agricultural employment levels.

Survey results showed the area devoted to crops to be larger in 1994 but average yields were down. Orchards yields were higher than national averages because the coefficients used for transforming output per tree, the information collected in the survey, into output per decare, needed to apply normative labor requirements, are not precise enough. Trees on household plots tended to be larger than those in the orchards of former collective farms, and they yielded more fruit per tree. The standard coefficient estimated the number of trees equivalent to one decare based on large orchard plantings. Thus the number of household trees, when aggregated to the equivalent number of decares, produced a greater yield per decare than did the cooperative orchards.

The survey indicated an increase in the number of the goats and the chickens, and a sharp decline for cattle, pigs, and sheep. This is exactly the same trend evident at the national level.

Survey results reveal some important changes not apparent in national data. These include the understatement of rural population, the increased role of private plots[5] in absorbing additional labor, the magnitude of the shift from full time to part time labor, the significance on non-agricultural employment in rural areas. Tables 5, 6 and 7 summarize important data from survey questions.

[5] We use the term "private plot" to describe privately-farmed areas that include the plots allocated by cooperatives, property that has been restituted, or properties that are otherwise available for farming household members. The village survey data do not distinguish between these various forms. Village data show that the average plot size increased from approximately 3 decares in 1989 to 9 decares in 1994.

Table 5. Land Area, Commodity Output, and Labor Requirements in All Villages.

	area or numbers		*output (tonnes)*		*average yield*		*labor norm req.*		*labor full-time*	
	1989	*1994*	*1989*	*1994*	*1989*	*1994*	*1989*	*1994*	*1989*	*1994*
Field Crops										
(decares)	137,437	161,652	56,695	47,034			137,740	164,121	574	684
wheat	47,883	52,977	17,908	15,362	374	290	29,308	29,413	122	123
barley	18,423	10,374	6,544	2,961	355	285	11,112	3,623	46	15
maize	21,285	15,223	9,891	7,028	465	462	22,963	14,571	96	61
oilseeds	13,745	46,120	2,151	3,302	157	72	7,764	18,382	32	77
alfalfa	11,677	8,779	5,113	4,110	438	468	11,451	9,045	48	38
potatoes	2,730	4,599	3,250	2,653	1,190	577	39,342	72,758	164	303
other field crops	21,694	23,581	11,837	11,618	546	493	15,800	16,328	66	68
Green House Vegetables										
(decares)	176	230	204	306			137,433	183,111	573	763
tomatoes	24	35	60	76	2,452	2,191	24,404	34,647	102	144
cucumbers	2	11	7	18	3,272	1,644	2,674	14,185	11	59
beans	46	59	4	11	92	185	6,916	8,876	29	37
peppers	2	5	2	4	1,153	694	1,783	5,354	7	22
others	102	120	131	197	1,290	1,643	101,656	120,049	424	500
Field Vegetables										
(decares)	5,759	9,555	5,016	4,761			59,360	118,699	247	495
tomatoes	791	2,266	2,166	2,171	2,738	958	17,458	49,769	73	207
cucumbers	66	1,154	95	196	1,445	170	1,788	11,217	8	47
beans-green	1,655	1,681	69	100	42	60	1,268	1,907	5	8
peppers	676	679	594	462	880	680	9,518	14,982	40	62
others	2,571	3,775	2,091	1,832	813	485	29,328	40,824	122	170
Orchard Crops										
(number of trees)	124,821	140,444	8,860	3,943			85,705	89,612	357	373
apples	104,708	114,830	6,855	1,515	786	158	54,599	52,169	228	217
peaches	1,971	2,657	44	117	672	1,320	428	737	2	3
pears	3,944	4,212	172	172	1,309	1,228	2,063	2,150	9	9
cherries	8,196	11,816	1,252	1,512	2,292	1,920	25,136	30,515	105	127
others	6,002	6,928	537	627	1,342	1,357	3,480	4,042	15	17

Table 5. Land Area, Commodity Output, and Labor Requirements in All Villages (continued from previous page).

	area or numbers		*output (tonnes)*		*average yield*		*labor norm req.*		*labor full-time*	
	1989	*1994*	*1989*	*1994*	*1989*	*1994*	*1989*	*1994*	*1989*	*1994*
Berries (decares)	383	101	217	28			8,394	1,064	35	4
strawberries	332	31	210	20	634	638	8,175	768	34	3
other berries	51	69	7	8	131	112	219	295	1	1
Vineyards (decares)	1,930	658	1,438	365	745	555	17,287	5,425	72	23
Livestock (number of animals)	95,439	103,297	20,842	8,801			239,878	147,606	1,000	615
milk cows	4,550	2,173	12,307	6,986			125,812	63,052	524	263
other cattle	3,339	1,671	855	483			26,898	12,293	112	51
breeding sows	380	315	59	55			741	639	3	3
other pigs	4,969	3,194	573	365			6,470	4,318	27	18
breeding ewes	16,706	10,751	817	463			55,415	38,264	231	159
other sheep	7,330	6,344	6,020	184			12,161	10,524	51	44
breeding goats	1,243	2,065	57	99			4,124	7,348	17	31
other goats	1,145	1,563	27	49			1,899	2,593	8	11
chickens	55,777	75,221	127	118			6,359	8,575	27	36
Total Crops (decares)	155,554	183,243	72,430	56,436			445,918	562,031	1,858	2,342
Total Labor Crops & Livestock							685,796	709,637	2,858	2,957

*Note: Calculattions have been rounded off to nearest whole number.

Source: Survey questionnaires B,C, & D.

Table 6. Labor Supply and Allocation by Village Households.

	number of people		total number of days in:						full equivalent	
			---private plots---		-----co-ops-----		-----non-agr.-----			
	1989	1994	1989	1994	1989	1994	1989	1994	1989	1994
pensioners	4,340	6,203	353,262	452,141	91,752	37,727	18,867	11,118	1,933	2,087
people of working age	5,206	5,968	189,586	306,465	343,669	198,162	802,179	499,627	5,564	4,184
children and students	1,896	1,841	7,301	7,109	959	74	2	397	34	32
Total	11,443	14,013	550,150	765,715	436,380	235,963	821,048	511,142	7,532	6,303

Source: Survey questionnaire D.

Table 7. Full-time and Part-time Employment in Village Agriculture.

	---number of people---		---total man-days---		---full equivalent---	
	1989	1994	1989	1994	1989	1994
Directly employed in agricultural production:						
full-time	1,552	920	374,882	223,272	1,569	934
part-time	542	1,046	48,589	75,268	205	318
total	2,094	1,966	423,471	298,540	1,773	1,252
Not directly employed in agricultural production.						
full-time	135	93	31,750	19,460	133	82
part-time	0	14	0	420	0	2
total	135	107	31,750	19,880	133	83
TOTAL	2,229	2,073	455,221	318,420	1,906	1,335

Source: Survey questionnaires B, C.

The increase in village population. Village population data are important because they give a sense of the total labor pool and its character. There is a discrepancy between the population data provided by the mayors' offices and that summarized from household interviews. The official data show more persons registered in the village in 1989 than were reported in the household survey. However, in 1994, the household population was greater than that reported in official records. The number of people in surveyed households increased 22.5% while village population statistics show a decline of 15.1%.

We believe that official population figures for the villages may have been overstated in 1989 because outside job opportunities attracted registered persons away from the village so they were not physically present to provide labor. The reverse appeared to be true in 1994 when outside job opportunities were curtailed and the cultivation of private plots became important for economic reasons and land was more available. A detailed examination of the primary data for each village showed that when answering the questionnaire, heads of the households were likely to include some family members that were not living in the village but were working on the private plots during weekends and other personal time periods. Similarly the householders did not include people living in the village but working elsewhere and not contributing to the household plot.

The role of private plots. Survey results show that the labor surplus increased between 1989 and 1994, just as found in the national data, but that it became far more significant for cooperatives and less significant for households. Thus, the private plots were able to absorb some of the labor made available from immigration (the total labor supply increased) and from a decline in employment by cooperatives and non-agricultural enterprises. The area of and production from private plots increased and more household labor was required to support the increase. This caused the surplus of household labor to decline from 50 percent to 37 percent, close to the surplus level of the cooperatives. The intensity of labor use (i.e., the average number of days worked per year) in the former collective farms and new coops began to converge and became within 10 percent of one another by 1994.

With the increase in household labor supply, the number of days worked per person dropped from an average of 158 days in 1989 to an average of 108 days in 1994. Of these amounts, 48 days were allocated to private plots in 1989 and 55 days in 1994 resulting, at least in part, from the decrease in farming services provided by former cooperatives and the increase in average plot size.

The large decline in the non-agricultural sector has caused more people of working age to supply added labor to the private plots and their share of this labor has risen from 34 percent to 40 percent. Although pensioners increased their labor input, their share declined from 64 percent to 59 percent, mainly because of the expansion of the labor supplied by people of working age. This expansion was insufficient to offset the severe contraction of employment by coops and non-agricultural activities.

The increase in part-time labor utilization. There was a substantial shift from full-time to part-time work. Cooperatives reported that full-time jobs dropped 40.3% and part-time jobs gained by 56.2%. Part-time employment increased its share of total employment in cooperatives from 25.88% to 53.2%, and its FTE from 11.47% to 25.4%. The number of people with full-time agricultural jobs declined from 1,687 to 1,013, and the number of people with part-time work increased from 542 to 1,050. These data show that the surplus labor in rural areas has increased not so much from job losses as from a decrease in the amount of time worked.

The importance of non-agricultural employment. Job losses in non-agricultural enterprises accounted for 88 percent of the employment decline recorded in the surveyed villages. Only 12 percent of the loss was attributed to agricultural production. This experience in rural areas is surprisingly close to the national situation where non-agricultural job losses accounted for 91 percent of the decline in employment. The share of non-agricultural employment reported by surveyed villages was 68 percent in 1989 and 55 percent in 1994. Household data support the importance of non-agricultural employment but not at the same high share. They indicate that non-agricultural activity accounted for 60% of the FTEs lost between 1989 and 1994. The details of the village data indicate that the employment of village persons in village agricultural enterprises (not including plots) changed very little. The job loss in village agriculture for village residents was reported to be 18 jobs or 1%. The major changes were in non-agricultural employment and employment in agriculture and non-agriculture outside of the village, and in the employment in the village of outsiders. It is clear from these results that non-agricultural employment in rural areas is at least as important, if not more important, than that in agriculture and that non-agricultural job losses are the major cause of unemployment and under-employment in rural areas. Policy remedies, therefore, must focus mostly on non-agricultural activities as a means for addressing this situation.

Policy Implications and Conclusions

The data from the survey of villages and from the analysis of national statistics reveal some important conclusions. Agricultural employment has declined at a slower rate than other employment in Bulgaria. It has declined at a slower rate than some other countries in the course of agricultural modernization. The decline in non-agricultural employment in rural villages has been much more severe. Concurrent with these changes has been a marked increase in the amount of part-time work. The average number of days worked per household has dropped significantly, as revealed by the household survey, and confirmed by cooperative employment data. As the result of these changes, real per capita income of village residents declined by one-third from 2,411 leva annually to 1,626 leva. Without the income gained (either through sale or through personal consumption) from expanded production on private plots, the situation would have been worse. This

suggests that there is an important income problem, rather than an employment problem (Table 8).

Table 8. Wages, Work and Income, Surveyed Villages, Bulgaria.

classification	unit	1989	1994	change 1989/1994
Average national wage	leva/year	3,292	57,864	17.6
Average agricultural wage	leva/year	3,232	41,148	12.7
Average time worked	per capita*			
farm cooperatives	days/year	38	17	0.45
non-agriculture	days/year	72	36	0.50
Wage and in-kind income				
farm cooperatives	leva/year	512	2,915	5.7
non agriculture	leva/year	988	8,180	8.8
private plot	leva in-kind	912	22,626	24.8
Total	leva/year	2,412	34,221	14.2
Real income	1989 leva	2,412	1,626	0.67

* Per capita data refers to all persons reporting work days during the year.

Sources: National Statistical Institute, *Statistical Reference Book of Bulgaria*, various years.
Ministry of Agriculture, Agriculture Policy Analysis Unit, *Village Survey*, 1995.

The differential between agricultural and industrial wages should have accelerated the employment outflow from agriculture and slowed it in industry[6]. However, numerous economic and policy factors intervened to prevent labor flows from following the path of relative wage rates. Thus rural communities had to contend with unemployed persons and employed persons earning very low salaries. This is consistent with the experience in other transition economies where at least 50% of the poor have jobs; and in some countries up to two-thirds of the poor are employed (Milanovic). This situation of unemployment and poverty creates high social costs and the need for important investments in education, training and retraining (Barr and Harbison).

6 The average monthly salary in public sector enterprises in industry in March 1995 was 8,312 leva (about US$128) and in agriculture was 4,447 leva (about US$69). See European Union.

Agricultural employment, that is the number of people receiving wages or income from farming, declined at an average annual rate of 2.8 percent between 1989 and 1994. This rate is equal to that of Portugal and higher than that experienced in Greece during the first decade of its integration into the European Union. However, it is far below the rate achieved by Spain as it redirected emphasis from agriculture toward the industrial and service sectors. Spain's agricultural employment declined at an average annual rate of 4 percent, slightly above the rate for Italy and France. The implication is that if Bulgaria is to follow the development path of these latter countries, then it should be reducing its farm labor force at an even faster rate. The success of such a policy, however, rests on a development in the industrial and service sectors that is sufficient to absorb the surplus labor pool.

It is not clear that Bulgarian agriculture was over-manned in 1989. On the one hand, Rock argues that most people in Bulgaria knew that almost enterprises had excess labor, and the European Union pointed out that Bulgarian agriculture was labor intensive with low-average productivity compared with other sectors. On the other hand, Karp calculated that the agricultural share of employment was in keeping with the shares of other countries with similar income levels. Therefore there would not be a significant exodus from agriculture, for a given level of output, unless incomes rose. An increase in labor utilization might be expected if national income declined. These findings from other transition economies confirm the conclusions made here that the outflow from agriculture is what might have been expected and could be lower than needed for an efficient agriculture.

Improved awareness of rural population is also critical to developing economic and social strategies. The significance of the village survey results is that official data may under-estimate the number of persons in rural villages that might be available for work, or that might make potential claims on benefits from rural development schemes.

If incomes in agriculture are to rise, this could happen through a recovery in the level of output, by more capital investment or by transfers through agricultural policy. The first of these is unlikely to happen while government policies suppress prices to farmers as they have been for grain for the last three years. The second is also unlikely while agriculture is unprofitable and discouraging to investors. There are few signs that Bulgarian policy makers have the will or resources to make income transfers to farmers. So far, the transfers are in the opposite direction.

It seems clear that rural and urban employment and unemployment issues cannot be considered separately; nor can the issues of employment and income. Effective policy responses will involve investment in infrastructure that will make the labor market efficient. These changes include a nationwide data bank and information system, improvements in housing that will facilitate labor mobility, and targeted educational and training program. The first of these changes can be done at relatively low cost. It would provide job seekers and employers with a way of finding one another. The other changes are more expensive and may include a

comprehensive system of income supplements for the poor (Milanovic). Macroeconomic stabilization would help in stimulating economic development and job growth. However, it is not a necessary condition for microeconomic structural reforms (Portes). Such reforms can be started now.

Currently, Bulgaria has an under-employed labor force that represents a waste of human resources that could otherwise contribute to the country's economic and social development. If this situation persists, agriculture will remain a low wage sector with relatively low productivity. This is not consistent with a long-run strategy for agricultural development.

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