India 1960-2010: Structural Change, the Rural Nonfarm Sector, and the Prospects for Agriculture

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Abstract

Despite accelerating economic growth, the structural transformation of the Indian economy has been slow, with a widening labor productivity differential between the nonagricultural sectors and agriculture. Labor absorption in the urban economy, and especially in the manufacturing sector, has been low; formal sector jobs are few and declining as a share of employment; and labor contracts are increasingly informal. As a consequence, and combined with rapid population growth, the labor force in the rural areas is still growing fast. Agricultural growth has not responded to the accelerating income growth, and agricultural employment is growing slowly. It is the rural non-farm sector that has emerged as the major source of rural and economy-wide employment growth, with rural non-farm self employment and incomes growing especially fast. As a consequence, despite the growing labor productivity differential between the agricultural and the nonagricultural sector, urban and rural poverty rates have converged, and urban-rural per capita income and consumption differentials have not widened. Rapid economic growth is associated with a stunted structural transformation, in which the rural non-farm sector has picked up the slack in urban employment growth.

As most of these macro employment trends are likely to continue, we can envision an agricultural sector in which household and farm sizes will continue to decline. Households will strive for income growth via technical change, increased irrigation, and continued diversification towards high valued agricultural commodities and towards the non-farm sector. With employment opportunities in the non-farm sector considerably better for young men than for young women, the current trend to feminization of agriculture will continue. Within these constraints, a positive vision for agriculture and rural development can nevertheless be achieved if government policy is supportive of the ways in which households will try to increase their incomes. Rapid policy and institutional change will be required to overcome poor performance of many government programs.

The paper is divided into a first section on structural transformation, agriculture and the rural non-farm economy from 1960 to 2010. The second section uses the results from the first section to develop a vision for agriculture and rural poverty reduction that takes account of the opportunities and constraints identified.

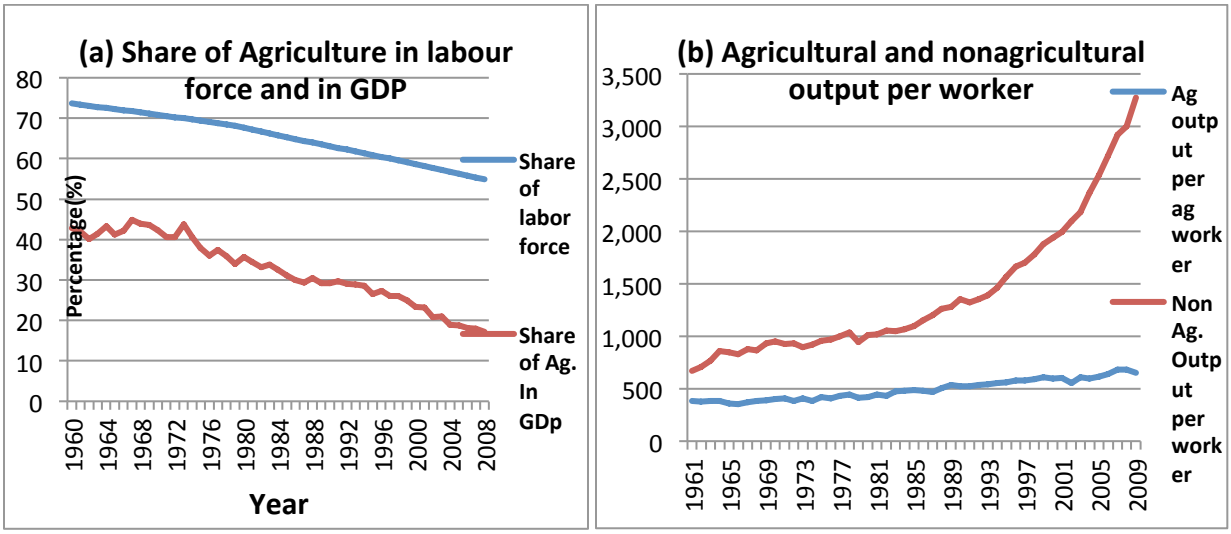
Structural transformation, agriculture, and the rural non-farm economy

All across the industrialized countries, prior to rapid economic growth and structural transformation, agriculture accounted for the bulk of the economic output and of the labor force. Because productivity in the nonagricultural sector was higher than in the agricultural sector, the share of agriculture in total GDP fell short of its share in the labor force. As industrial growth took off, industry became even more productive, and the productivity differential with agriculture increased. With rapid economic growth the share of agricultural in GDP fell much faster than the share of agricultural labor, and the inter-sectoral differential in labor productivity widened. Farm incomes visibly fell behind incomes earned in the rest of the economy. "*This lag in real earnings from agriculture is the fundamental cause of the deep political tensions generated by the structural transformation*" (Timmer, 2009, p6, emphasis in original).

During the structural transformation, labor is pulled out of agriculture, at a speed that depends on the labor intensity of industry and services. A turning point is reached when the share of labor in agriculture starts to decline faster than its share in output, and the productivity differential between the sectors starts to diminish. *Compared to international experience the structural transformation in India has been relatively slow and atypical, mainly on account of a low share of manufacturing in the economy and of its disappointing growth and employment performance.* While the agricultural sector has declined as a share of GDP, and manufacturing has not grown significantly, the slack has been taken up by the remaining industrial sectors and services. Absorption of labor in the urban economy has been slow, and rural-urban migration has been far less than could have been expected in a rapidly growing economy. Therefore the difference between the share of agriculture in the economy, and its share in the labor force has widened

significantly (Figure 1). At the same time, the accelerating growth of the economy did not lead to an acceleration of the agricultural growth rate. As a consequence of high nonagricultural growth, low agricultural growth, and continued growth of the agricultural labor force, labor productivity in the nonagricultural sector and the agricultural sector has widened at an accelerating rate and their ratio now stands at over 4.2. *These data show that India is still far away from a turning point in its structural transformation, where the shares of agriculture in GDP and in the labor force are starting to converge, and the productivity differential between the non-farm and the agricultural sector starts to narrow.*

Figure 1: Structural transformation of the Indian Economy, 1961-2010



Poverty and Inequality

With rapidly rising productivity differences between the nonagricultural sector and agriculture, one would expect rising differentials between urban and rural areas in poverty, and in per capita incomes and consumption. However, this has not been the case in India. A seen in table 1, the rural poverty rate declined from 50.1% in 1993-94 to 31.8 % in 2004-05, or by 18.3%, while urban poverty declined from 41.8 % to 25.7% percent, or by 6.1%. Therefore, in absolute terms the decline in rural areas is larger than in urban areas, but in relative terms the rate of poverty decline in urban areas is slightly faster than in rural

areas. By 2004-05, in urban areas both the poverty gap and the squared poverty gap had become deeper, indicating a progressive urbanization of poverty. (World Bank, 2010). *Clearly these trends are inconsistent with a growing divergence of rural and urban poverty.*

TABLE 1: CHANGES IN RURAL AND URBAN POVERTY RATES

Per cent of persons below poverty line	RURAL	URBAN	Difference
1993-94	50.1	31.8	18.3 = 45 %[1]
2004-05	41.8	25.7	16.1 = 48 %[1]

Source: Tendulkar report, 2011(Planning Commission); [1] Calculated with respect to the mean percentage

The ratio of urban to rural per capita income declined from 2.45 in 1970-71 to 2.30 during eighties and early nineties. On the other hand, data on consumption shown in table 2 suggest that the ratio of urban consumption to rural consumption increased from 1.54 in 1983 to around 1.70 in 2004-05 and 2009-10. Whether rural-urban disparities have increased is therefore dependent on the data used and the period considered. But neither data series suggest a sharp change in urban-rural disparities over the past 30 years.

Given the significant increases in non-agricultural to agricultural productivity differential, it is surprising that the urban-rural per capita income and consumption gaps have not increased sharply, and that the gap between the rural and urban headcount poverty rates has not increased sharply as well.

TABLE 2: CONSUMPTION INEQUALITY, INDIA (1983-84 TO 2009-10)

	1983	1987-88	1993-94	2004-05	2009-10
Gini Coefficient of distribution of consumption					
Rural	0.30	0.30	0.28	0.30	0.28
Urban	0.30	0.35	0.34	0.37	0.37
Urban-rural ratio of mean consumption (Constant prices)*					
	1.54	1.44	1.64	1.72	1.69

Source: Ahluwahlia, 2011, table 6, *Original shows urban rural ratio.

Ravallion and Datt had shown in 1996 that, in line with the international experience, prior to 1991 rural growth was the most important driver of poverty reduction and reduced rural poverty, national poverty and even urban poverty. But urban growth only reduced urban poverty and had no impact on rural poverty or national poverty. In 2009, Datt and Ravallion updated their earlier work to 2004-05. They showed that rural growth remains significant for reducing rural poverty and national poverty. But since 1991, urban growth has become the major driver not only of urban poverty reduction, but as well for both national and rural poverty reduction.

However, Himanshu et al. (2010) showed via econometric analysis that higher yields are associated with declining rural poverty, suggesting that the impact of agricultural production growth on poverty remains high. There is also a strong and negative impact of higher agricultural wage growth on rural poverty, consistent with the strong agricultural impact on rural poverty. In many ways this is not surprising, as agricultural workers constitute about half of India's overall poverty population and an even greater share of its rural population of poor people.

In conclusion, neither poverty, nor per capita income and consumption show signs of rapid divergence between rural and urban areas as a consequence of the rising disparity of labor productivity between agriculture and the non-agricultural sectors, which we will have to explain in the following sections. Consumption inequality has recently increased in urban areas but stayed fairly constant in rural areas. While rural growth and agriculture were the main drivers of poverty reduction before 1991, since then urban growth has become a quantitatively more important driver of poverty reduction overall and even in rural areas. Nevertheless agriculture productivity as measured by yields remains an important driver of rural poverty reduction and especially rises in agricultural wages.

Employment unemployment, and wage trends

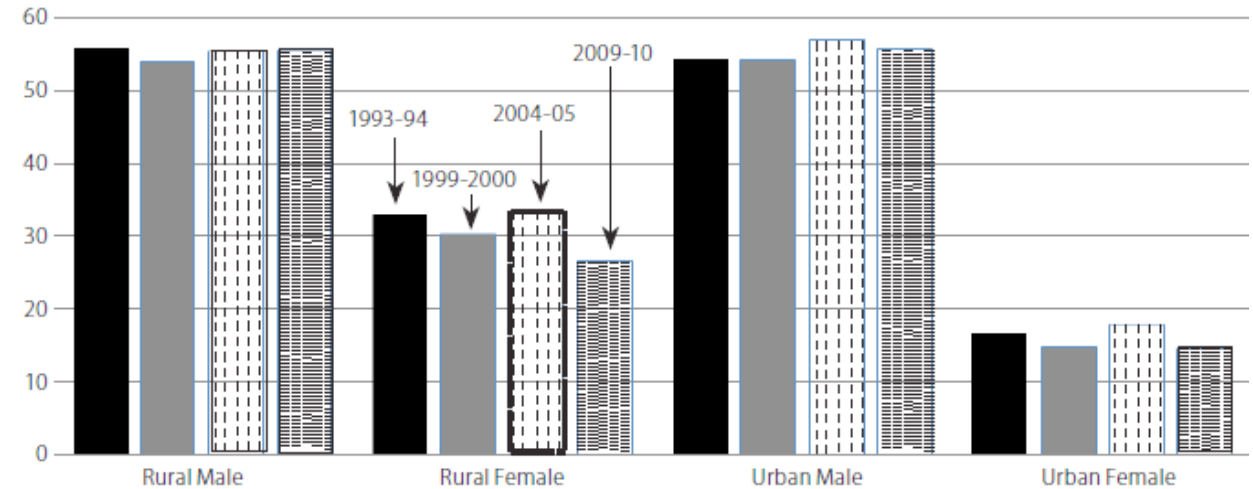
Rapid movement towards a structural transformation should show up in the Indian data by a tightening of the rural labor market and an increase in opportunities for rural-urban migration. This section shows that this is also not happening, and the following section instead shows that rural households are diversifying into the rural non-farm sector. The limited absorptive employment capacity of the urban economy has led the non-farm sector to become the main destination of growing rural labor forces. While this is a structural transformation of sorts, it is a stunted one.

Rural and urban employment trends

While the India's population growth rate has slowed down, the growth of the labor force has accelerated, and by the first half of the last decade was growing at 2.8 percent. The rural labor force has grown even more rapidly. Hazell et al. 2011 cite UN population projections that suggest that the rural population will peak at 900 million in 2022. They then project that the rural labor force may continue to grow until 2045.

Rural and urban males have always had fairly similar labor participation rates, while the rates for rural females were much lower, and even lower for urban females (Figure 2).

Figure2: Trends in labor participation rates



The LFPR pertains to usual status.

Source: Choudhury, 2011

Since 1973 there is little discernible trend in rural male labor participation and only limited fluctuations. Female rural and urban participation rates fluctuated from 1977-78 to 2004-05 with a significant increase in the early years of the century in both rural and urban areas, and since then have gone down, in rural areas to their lowest level over the entire period. Himanshu (2011) interprets the movement of women into the labor force between 1999-00 and 2004-05 as a response to the agrarian crisis of the period. The subsequent sharp drop in labor participation to 2009-10 is then interpreted as a withdrawal from the labor markets as economic conditions improved again. Others have pointed to the very large increase in participation in education as a major reason for withdrawal from the labor market.

Employment growth in Indian agriculture slowed down between the early 1990s to 2004-05 (World Bank 2011). Choudhury 2011 shows that in both rural and urban areas there are some common trends: a slight decline in the manufacturing share of employment, which is consistent with the constancy of the manufacturing share in the Indian economy, and its far slower growth in the past decade than planned; the decline in the in the share of agriculture and allied industries; and the sharp increase in construction; trade, hotels and restaurants are a very large share of the labor force in urban areas, much smaller in rural areas, and in both areas they have stayed fairly constant.

As shown in table 3, employment in India in 2008 is very much concentrated in the informal sector. Between 1999-2000 and 2005-05 the proportions of workers in the formal sector declined from 8.8 to 7.5 percent. The National Commission for Employment in the Unorganized Sector (NCEUS) defines organized employment as employees who receive provident fund and social security benefits. Within the organized (formal) sector, the proportion of employees with informal contracts rose from 37.8 percent to 46.7 percent. Clearly, the Indian labor market has shown a marked tendency to informalization of labor relationships, and only limited creation of high quality jobs for urban workers as well as for migrant from

rural areas. Employment in the rural non-farm sector has followed the trend to informalization as well (World Bank, 2010)

TABLE 3: DISTRIBUTION OF WORKERS BY TYPE OF EMPLOYMENT AND SECTOR ORGANIZATION

(million)

Sector	1999–2000			2004–2005		
	Informal	Formal	Total	Informal	Formal	Total
Unorganized Sector	341.28	1.36	342.64	393.47	1.43	394.90
	(99.60)	(0.40)	(100)	(99.64)	(0.36)	(100)
Organized Sector	20.46	33.67	54.12	29.14	33.42	62.57
	(37.80)	(62.20)	(100)	(46.58)	(53.42)	(100)
Total:	361.74	35.02	396.76	422.61	34.85	457.46
	(91.17)	(8.83)	(100)	(92.38)	(7.46)	(100)

Notes: 1. UPSS basis.
2. Figures in bracket indicate percentages.
Source: Estimates by NCEUS.

Source: Government of India 2008, Table 4.7.

Urban employment growth, and particularly in the manufacturing sector, has been inadequate to provide enough employment opportunities for workers from rural areas. The great informality of employment in the Indian economy and in the organized sector, and the deepening of urban poverty discussed in the last section sharply reduce the attractiveness of urban areas for rural migrants, especially for unskilled and semi-skilled ones. Urban areas of course remain a pole of attraction of highly skilled workers. Nevertheless, workers are piling up in rural areas.

Unemployment and Wages

As discussed in Choudhury 2011, in 2009-10 the current daily status unemployment rates were the lowest for urban males 5.5 percent, followed by rural males at 6.2 percent, 8 percent for rural females, and slightly over 9 percent for urban females. They were higher for 2004-05, which is one reason that for an interpretation of the growth of labor participation in the period preceding that year as a partly or fully driven by distress (World Bank 2010, Himanshu, 2011). Urban unemployment rates, but not rural ones, today are also lower than in the 1990s. Nevertheless the urban labor market, it is still very hostile for females, and therefore must remain a deterrent to rural-urban migration.

As shown in table 4, the growth rate of real agricultural wages declined between 1980 to the middle of the last decade, but has started to increase recently. Since then real wages in the entire economy have risen at a fairly rapid pace. The fastest real wage growth is observed for urban female salaried workers at 7.8 percent, followed by rural female casual workers at 6.2 percent and by urban male salaried workers. Since female participation rates fell, rising wages are consistent with a voluntary withdrawal of females from labor markets, either as a consequence of growing family income and/or greater participation in education. Wages of casual male workers rose at 4.5 percent in rural areas and 4.2 percent for urban males, which in each case means a compound wage growth of close to 25 percent over the past five years. There is also no recent trend in divergence of unskilled wages between rural and urban areas.

TABLE 4: AVERAGE DAILY REAL WAGE RATE FOR WORKERS

in 2004-05 Prices (Rs)

Year	Rural		Urban	
	Male	Female	Male	Female
Regular Salaried				
2004-05	145	86	203	153
2009-10	165	103	260	213
Growth rate	2.8	4.2	5.6	7.8
Casual				
2004-05	55	35	75	44
2009-10	67	46	91	53
Growth rate	4.5	6.2	4.2	4.1

Source: Choudhury, 2011. Note: The wages for urban workers have been deflated by consumer price index (industrial workers) (CPI(IW)) and that of rural workers by consumer price index (agricultural labour) (CPI(AL)). This wage refers to the wage for casual workers engaged in work other than public work.

Programs for agricultural, rural and social development, and for employment generation

How can one explain rising rural wages in an environment where agricultural growth has been quite sluggish. A first explanation is the injection into rural areas of a large flow of agricultural subsidies and program expenditures that have increased rural purchasing power. The second is the rise in rural non-famr jobs discussed in the next section. Since before the beginning of the 11th Plan, public expenditures for the 13 flagship programs for agriculture, rural development and social development have been increasing rapidly, and now amount to Rs 186,539 crore, or approximately 37 billion US dollars. Two thirds of the expenditures are in programs that are only operating in rural areas. The rural component of the social programs will also take the lions share of these expenditures. The rural component of all programs therefore must reach or exceed 85 percent of the total expenditures, or about 158,000 crore, which is nearly 17 percent of agricultural GDP. Therefore, rural development, employment and social development programs, even if they encountered large leakages, are transferring significant purchasing power into the rural economy, and therefore are likely to lead to increases in the demand for food and non-farm goods and services, generating multiplier effects on both agriculture and on rural non-farm incomes. In addition, a number of programs will also impact agriculture and rural development via their direct program impacts. Their direct and indirect impacts will therefore also be a driver of the increase real in real rural wages.

The employment impact of the Mahatma Ghandi National Rural Employment Guarantee Act (MNREGA) has been described by the Planning Commission: “With a people-centered, demand-driven architecture, completely different from the earlier rural employment programmes, MGNREGA has directly led to the creation of 987 crore person-days of work since its inception in 2006-07. In financial year 2010-11, MGNREGA provided employment to 5.45 crore households generating 253.68 crore person-days. It has also successfully raised the negotiating power of agricultural labour, resulting in higher agricultural wages, improved economic outcomes leading to reduction in distress migration.” (Government of India 2011b).

The rising importance of the rural non-farm sector

If the urban areas are inhospitable to migrants from rural areas, then where has the rapidly growing rural labor force found employment and opportunities for increasing their incomes? If there had been no such opportunities, undoubtedly rural poverty would not have improved at least as much as urban poverty and rural-urban incomes parity would have declined. In the face of limited migration opportunities it is a significant consolation that the rural non-farm sector has been much more dynamic than the farming sector, both in terms of GDP growth as well as in terms of employment generation (table 5). In the last decade, employment growth in rural areas has come primarily from an increase in rural nonfarm employment. In the 1980s, 4 out of 10 rural jobs were in non-farm sector, now it is 6 out of 10 (Himanshu et al. 2010). Given the large size of the rural labor force these numbers mean that the rural non-farm sector has emerged as the largest source of new jobs in the Indian economy.

TABLE 5: TRENDS IN AGRICULTURAL WAGES AND IN NATIONAL, RURAL NONFARM AND AGRICULTURAL GDP

(Annualized rates of growth, %)

Year	Non farm employment	GDPN	Nonfarm GDP	Agriculture GDP
1983-2004	3.3	5.8	7.1	2.6
1983-1993	3.5	5.2	6.4	2.9
1993-2004	4.8	6.0	7.2	1.8

Source: Himanshu et al. 2010, table 3

Notes: GDP at factor cost at 1993-94 prices. Agriculture GDP originating in agriculture, forestry, and fishing. Nonfarm GDP defined as a residual.

The growth in the rural non-farm sector employment has occurred all over India, but has been highly uneven. It is highest in Kerala, West Bengal, and Tamil Nadu, and lowest in Chhattisgarh, Madhya Pradesh, followed by Uttarakhand, Karnataka Gujarat and Maharashtra (World Bank, 2010).

Until 2004, the growth in non-farm jobs has come primarily from increases in services, transport and construction. In 1983, close to 40 percent of rural non-farm jobs were in manufacturing. Despite continued growth of rural manufacturing, this share has declined to just a little above 30 percent in 2004-05. In 1983 social services and trade, transport, and communication both generated about 26 percent of nonfarm jobs. Social services have since then declined to about 18 percent of the jobs, while trade, transport and communications have grown rapidly to about 33 percent. In 1983 construction was by far the smallest sector, with a share of 10 percent only. Since then it has grown the fastest and now generates close to 19 percent of the rural non-farm jobs. The high level of rural construction has visually transformed villages all over India with much better village infrastructure and housing.

As discussed previously, Himanshu et al. (2010) showed that higher yields are associated with declining rural poverty, suggesting that the impact of agricultural production growth on poverty remains high. There is also a strong and negative impact of higher agricultural wage growth on rural poverty, consistent with the strong agricultural impact on rural poverty. Foster and Rosenzweig (2005) show that nonfarm enterprises producing tradable goods (the rural factory sector) locate in settings where reservation wages are lower. If the rural factory sector seeks out low-wage areas, factory growth will be largest in those areas that have not experienced local agricultural productivity growth. Thus rural non-farm growth reduces spatial inequalities in economic opportunities and incomes. However, it is also consistent with distress-induced recourse to nonfarm employment. Nevertheless, the location of factories where wages are low has an equalizing impact on the income distribution in rural areas.

We previously discussed the finding of Datt and Ravallion that since 1992 urban growth also fuels rural poverty reduction. It may do so by fostering agricultural demand. But there is also evidence that it spurs growth in the rural non-farm sector: “During the two periods of analysis, 1983 to 1993-94 and 1993-94 to 2004-05, regression estimates suggest that nonfarm employment increased more in regions where urban incomes also grew. Disaggregating the analysis by different types of nonfarm employment, the results show that it is regular salaried jobs and self-employment activities that appear to be most strongly and

positively correlated with urban growth; casual nonfarm employment is uncorrelated with urban growth."

(World Bank, 2010, p 66). Additional drivers of recent rural non-farm growth are discussed in Box 2.

Box 1 shows that the rural labor market is significantly connected to the urban labor market, and that the farm and non-farm labor markets, while supporting a wage differential between them, are highly integrated.

Box 1: The behavior and impacts of farm, non-farm and urban labor markets

We use the econometric results from Binswanger et al, (2011b) for the period of 1999-2007 to discuss labor market behavior. These come from the REDS national panel data set of over 5000 households. A first finding in the table below is that in Indian villages the farm and nonfarm labor market are linked closely in a symmetric manner: The elasticity of the rural farm wage with respect to the predicted non-farm wage is close to 0.5 and the converse elasticity of the non-farm wage is almost the same size. A rise in the urban wage increases both these wages with an elasticity of around 0.17. Morover, the elasticity of the farm and non-farm wage to the aggregate agricultural price is almost identical at 0.04 (Table 4.1). Finally, a rise in either of the two wages leads to large reallocations of labor to the sector that has experienced the wage rate rise. The elasticities far exceed all other elasticities examined so far. The reason the two labor markets are so integrated is that the slightest change in their relative wage trends induces a lot of movement of the family labor to the other sector, and therefore quickly reducing the disparity.

The responses of rural labor to changes in wages

	Precited Farm wage	Predicted Nonfarm wage	Urban wage	Sum
Labor force	0.020**	0.075**	-0.059**	0.036[1]
Share of family labor in agric.	3.262***	-5.571**	Na	-2.309[1]
Share of labor in nonagriculture	-2.282**	4.944**	Na	2.662[1]
Share of students	-.980[1]	.637[1]	--	-.353[1]
Farm wage	--	0.484**	0.166**	
Nonfarm wage	0.488**	--	0.171**	

[1]Standard errors yet to be calculated, ** significant at 1% level

A rise in the urban wage leads to a reduction in family labor force, which means that it induces rural-urban migration. In the last column we sum up the elasticities of the left hand variables with respect to the wages on the top. The resulting sum tells us what would happen if the farm, the non-farm and the rural wage were to rise at by the same proportion. Such a rise of the national wage level would induce slightly more people to commit to work in rural areas. This suggests that people would prefer the rural areas if there was an overall income impact from higher wages. These preferences may well reflect their perception of the relatively hostile nature of the urban labor market which we discussed in section one. However when we look at the shares, the sums show that people would tend to move their work force from agriculture to non-agriculture, which suggests that while they prefer rural areas, they would prefer to work in the nonfarm sector. That supports the notion that people would rather move out of agriculture if they could.

Box 2: Recent drivers of Rural Non-Farm Growth

Between 1999-2000 and 2004-05, rural non-farm employment increased by 16 million by principal status, of which 8 million (nearly 50 percent) was in the form of self employment, 5 million as casual employment, and three million as regular employment (Himanshu, 2011). By industry, 5 million was accounted for by construction (equivalent to almost the entire increase in casual employment), 4 million by trade and hotels, 3.5 million by manufacturing, and 1.8 million by transport and communication. Within the large rural self employment component, three industries account for nearly 60 percent of the increase: 2.2 million was accounted for by retail trade, 1.5 million by manufacture of wearing apparel, and 1 million by land transport. Another 25 percent of the increase was accounted for by 7 activity codes that include post and communications, where the largest increase was in the form of STD/PCO booths, maintenance and repair of motor vehicles, and hotels and restaurants (ibid).

These data allow us to say something about the drivers of demand in the rural non-farm sector. They include rising incomes that are driving construction, trade and hotels, partly as a spillover from urban growth; public investment in infrastructure for construction; manufacturing, and technical change in the form of motorization of transport and agriculture, and in communication. These are undoubtedly not the only technical changes that are driving the non-farm sector.

Among the age cohorts, it is primarily males in the age group of 18-26 years old who have some education that is moving out of agriculture into non-farm jobs (Eswaran et al, 2009). Women are barely transitioning into the nonfarm wage employment sector. In growth terms, the number of rural men working off-farm doubled between 1983 and 2004-05; for women the increase was 73%. Individuals from scheduled castes and tribes are markedly more likely to be employed as agricultural laborers than in nonfarm activities, even controlling for education and land. Even a small amount of education, such as achieving literacy, improves prospects of finding nonfarm employment and with higher levels of education, the odds of employment in well-paid regular nonfarm occupations rises. Finally, those in the nonfarm sector own more land on average than agricultural laborers, except for those in casual nonfarm employment, (ibid).

Eswaran et al. (2009) use NSS data to show that wage premia associated with education were growing over time. By the 2004-05 NSS round these premia had increased to Rs 86 for literate workers over illiterate ones, Rs 197 for those who had attended middle school, and Rs 696 for graduates. The authors

conclude that that, if more middle school and high school graduates were available in 2004, they would have found employment in rural industry and services.

Over time, employment growth in the nonfarm wage sector has accelerated, while the growth in average earnings has decreased. These two trends have cancelled each other out, and for the last two decades, growth in total non-farm earnings has been constant (World Bank, 2010, p. 67). In spite of the preponderance of non-farm jobs in rural employment generation, Eswaran et al. (2008) estimate the contribution of the rural non-farm sector to rural wage growth to be only about 22 percent of the total growth, thereby confirming the importance of agricultural productivity growth to rural wage growth. In particular, the rural non-farm sector has not contributed to wage growth among the illiterate, but only among the more educated, (Eswaran et al, 2009).

So far we have focused on paid rural non-farm employment. As shown in World Bank 2010 and in Binswanger et al. (2011a), a particularly dynamic development has been the growth in self employment in the non-farm sector, especially of farm households, who diversified not only within agriculture but into the nonfarm sector. We analyzed changes in incomes sources between 1999 and 2007 in the nationally representative panel of rural households from the Rural Economic and Demographic Survey of the NCAER. Because of population growth and household subdivision, the sample grew from 4690 households in 1999 to 5759 households. Households have become smaller in size, contain a lower proportion of farm households, and on average own less land (Chapter 5). Despite these trends, per capita income grew from 8498 Rs. In 1999 to 12,370 Rs in 2007, i. e. by Rs 3881 (in Rs of 1999), or at an annual rate of 5.7 percent.

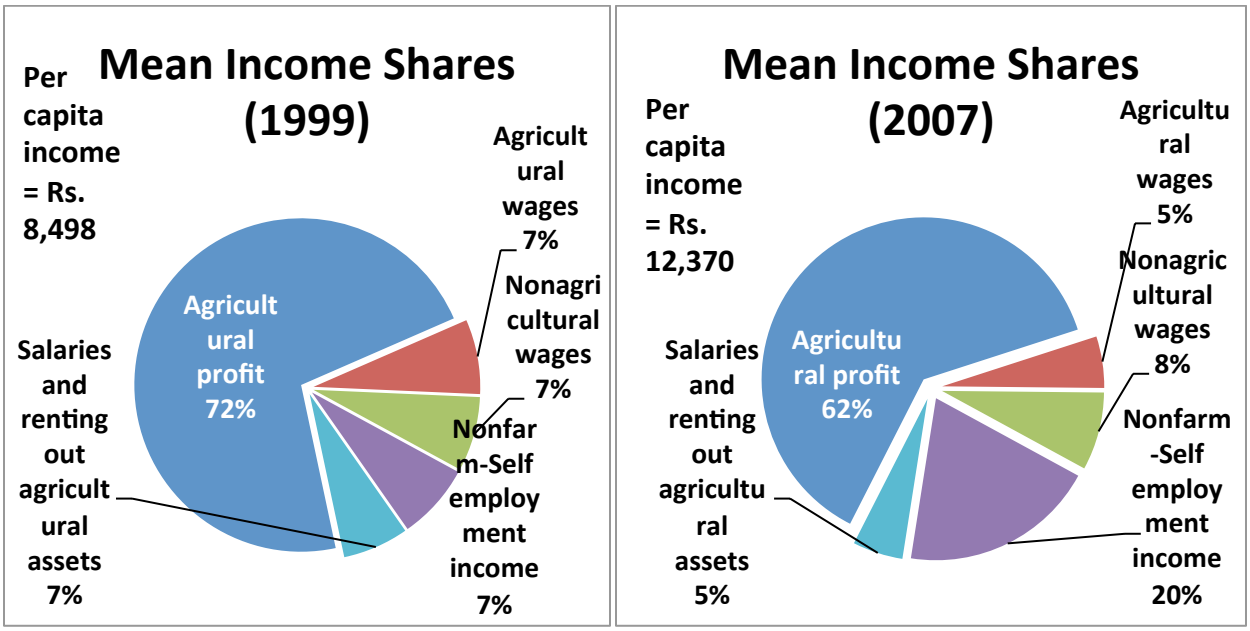
Between 1999 and 2007, the number of households engaged in non-farm self employment more than doubled from around 10 percent to nearly 20 percent. Unfortunately we do not know the gender of the owners of these enterprises, but given the growth of the rural self-help movement, it is possible that women participated significantly in this self-employment growth. While agricultural profits and

agricultural labor incomes grew in absolute terms, it was the rural non-farm self-employment income component that grew the fastest: For the households engaged in rural non-farm employment this component of income rose from Rs. 36,767 to Rs.64,045, i.e. by 74 percent in only 8 years, or at an simple annual rate of 9.3 percent. Figure 1.4 shows that for the sample as a whole, the shares of income shifted from agricultural profits and wages (-9.26 % and - 2.10 %) towards nonfarm self employment income (+12.19 %). At the same time the share of non-farm wage income has stayed nearly constant at around 7.5 percent.

The income data on the rural non-farm self-employment sector suggests that, while it may contain some distress employment, this is not the main driver of its expansion, and that instead it has become the most dynamic source of income growth or rural households, including for farmers. What we are observing among farms, who on average are declining in both land and household size, is not only diversification of agricultural production to higher valued products, but also to more remunerative self employment in the non-farm sector. There is therefore a marked tendency of agriculture to move to a productive and modern model of part time farming.

Together, these trends not only show us that the rural non-farm sector has been the most important outlet for self employment, and employment (for India as a whole, and in the rural sector) and has become the most important source of income growth of rural households. At the same time it has selectively absorbed young males into wage employment and encouraged even farmers to go into rural non-farm self employment, including for women. *Unfortunately, this implies a significant impediment to women, who have therefore increasingly concentrated on agriculture, contributing to a progressive feminization of agriculture.*

Figure 3: Composition of rural incomes in India, 1999-2007



Source: Binswanger et al. 2011a

In conclusion: Because of the accelerating growth of the non-farm sector, the sharp divergence in labor productivity between agriculture and non-agriculture has not resulted in a much sharper widening of the income, consumption and poverty gaps between rural and urban areas. This has led to employment, and especially self-employment incomes in the non-farm sector, including among farmers. It has not only happened in favorable agro-climate zones but also in less favored areas, and therefore has mitigated inter-regional income and poverty differentials. The new non-farm dynamic will also lead to a revision of the standard model of structural transformation that equated non-agriculture with urban areas, and will now have to include the rural non-farm sector. *However, the new form of structural transformation in India is a stunted one, because it primarily generates employment that is informal and/or insecure, and without the benefits of health and unemployment insurance and pensions.*

The vision of agriculture and rural poverty reduction

Using the results insights from the past sections we can develop a vision for the agricultural sector and for rural poverty reduction over the next decades. The structural transformation in India and rural-urban migration will likely remain constrained by the slow growth of employment in urban areas, and especially in manufacturing. For most unskilled and semi-skilled workers, opportunities are likely to remain constrained to the informal sector, or to informal contracts in the formal sector. There is therefore little chance that the urban economy will provide enough employment for the growing rural labor force to allow a large proportion to move to the urban economy. They will therefore have to find a way to improve their incomes in rural areas.

Given the need to raise agricultural income, and given the economies of scale that mechanization and credit constraints bring to agriculture (Foster and Rosenzweig, 2011), it may appear paradoxical that farm sizes would continue to decline. However, this tendency is in line with past trends in India, where farm sizes have grown modestly only in the Punjab, and declined everywhere else. This decline is in line with continued rises in rural populations and labor forces, and with the limited labor absorption potential of urban areas.[3] The rapidly rising prices of land will impart a portfolio motivation to hang on to land in the households owning land and remaining in the country side. While land rental markets could lead to land consolidation, up to the latest data available, land renting has continued to decline. To provide self employment opportunities for family labor, and especially for women, most households will be reluctant to rent out land in the future as well. With males having better opportunities in the rural non-farm employment than females, agriculture will continue to feminize (Box 3).

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[3] It is also consistent with trends in advanced economies that are dominated by small family farms, such as Japan, Taiwan, Korea, or European countries such as Italy, Spain, Switzerland, and Norway. However, in many of these countries the heavy subsidization of agriculture and constraints imposed on agricultural land markets have limited land consolidation via sales and rental markets.

Box 3: The feminization of Agriculture in India

Among rural workers, females have always been more likely to be engaged in the primary sectors, most of which is agriculture, than men, and correspondingly less in the secondary sectors. For example in 1977-78, 88.1 percent of female workers were engaged in primary sectors, compared to 80.6 percent of males. By 2009-10, these percentages had gone down for both males and females as a consequence of the rise of the rural non-farm sector. However, for males engagement in the primary sector had gone down to 62.8 percent, or by 25 percent, while for females they had gone down to 79.3 percent, or by only about 10 percent. Clearly the feminization of agriculture is increasing over time significantly.

The distribution of male and female rural employment by sector of the economy

NSS Round	Rural Males			Rural Females		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
32 (July'77-June'78)	80.6	8.8	10.5	88.1	6.7	5.1
38 (Jan-Dec'83)	77.5	10	12.2	87.5	7.4	4.8
43 (July'87-June'88)	74.5	12.1	13.4	84.7	10	5.3
50 (July'93-June'94)	74.1	11.2	14.7	86.2	8.3	5.5
55 (July'99-June'00)	71.4	12.6	16	85.4	8.9	5.7
61 (July'04-June'05)	66.5	15.5	18	83.3	10.2	6.6
64 (July'07-June'08)	66.5	16.2	17.3	83.5	9.7	6.8
66 (July'09-June'10)	62.8	19.3	17.8	79.3	13	7.6

Source: Himanshu, 2011, table 6

With these trends agriculture will be dominated by even smaller part time farm households; with a few full time farmers at the top and a large majority of part time marginal, small and medium farmers. The part time farmers will get more income from non-agriculture than from agriculture. All types of farmers will focus much more on horticulture, milk, poultry and eggs. Consumer demand will drive a trend towards traceability of agricultural output, quality control, and organic farming that will provide income additional income opportunities. Farms will be much more capital-intensive, and use advanced biological and mechanical technology for crops, horticulture, livestock and aquaculture. Water markets and other cooperative ways will be used to realize economies of scale. Depending on the economy-wide growth and Farmers will try to increase their agricultural incomes by adoption of modern technology, further

diversification towards higher valued crops, use of more machinery, and increasing reliance on family labor. The rural non-farm sector will continue to grow faster than agriculture, provide more income opportunities than agriculture, and produce an increased range of services and products, using progressively more modern technology. Therefore, the declining farm size trends and the diversification of households into the non-farm sector will undoubtedly continue. *As a consequence we are likely to see the emergence of a farm sector dominated by modern part time farmers, many of them female, whose households will combine farming with non-farm employment of the men or self employment in a non-farm sector.*

While these trends are likely to continue under both very rapid and more moderate economic growth, and regardless of agricultural policies and programs, both an optimistic and a more pessimistic future are possible for agricultural and rural incomes, and for rural poverty reduction. The optimistic version is based on a combination rapid economy-wide growth, as well as rapid agricultural and rural non-farm growth, both partly driven by urban demand and technology spillovers. Agricultural growth would be driven by rapid technical change and productivity growth, improvements in water use efficiency and irrigation growth, and the diversification of agriculture. Both full time and part time farmers will have plenty of new technology available and be able to adopt it, and many remunerative diversification opportunities in agriculture and non-agriculture. This will result in the emergence of a highly modern part time farming sector and rapid agricultural incomes growth, which will also spill over into more rapid rural non-farm growth. At the same time the demand and technology spillovers from the urban economy will further accelerate rural non-farm sector growth. Non-farm opportunities will continue to be more accessible to young and educated males than to females, accelerating the feminization of agriculture. However this may be associated with rising entrepreneurial opportunities for the female farmers. The combination of rising agricultural and rural non-farm incomes will support rapid incomes growth in rural areas, including rapid rural wage growth: Rural-urban incomes and consumption ratios will be improving,

or at least not deteriorate, and rural poverty will decline very rapidly, except in remote regions with poor agricultural endowments and poor prospects for rural non-agricultural development.

Under a pessimistic vision, economy-wide growth would be slower, and the slowdown in economy-wide growth would reduce the urban spillovers to higher agricultural and non-agricultural demand, and technology spillovers in the non-farm sector. Slow agricultural growth could not only result from reduced demand for food, but also if (a) technical change in agriculture remains slow, (b) services for part time smallholders are not scaled up and improved, (c) technology adoption will be limited more to the full time farmers, and (d) female farmers will have limited entrepreneurial opportunities. The combination of relatively slow agricultural growth would reduce rural non-farm sector growth, which would also suffer from reduced urban spillovers. Rural incomes growth and wage growth would be lower. Rural-urban incomes and consumption ratios would be deteriorating, and rural poverty would decline fairly slowly, even in better located and endowed rural areas. The policy sections will address how agricultural policies and programs and rural institutions can support rapid and inclusive agricultural and non-agricultural growth to make sure that the rural future looks more like the optimistic scenario.

Rising incomes from agriculture and the non-farm sector will not only have sharply reduced absolute poverty in rural areas but hunger as well, except perhaps in some tribal areas. Malnutrition may, however, might continue to persist, as it has in the developed world, including via the addition of obesity problems.

We will see in later sections that the private sector is emerging as a key driver of many components of agricultural and rural development. All of the non-farm sector development and all of farm investment is a private sector activity. In addition the private sector is transforming the marketing system from the farm

Box 4. How land reform, land administration, and land markets can support the optimistic vision

Even though under our visions for the future of agriculture, large scale consolidation of land holdings is neither necessary nor likely, flexible and secure land transactions contribute in several ways to the realization of the vision, as demonstrated by a series of careful studies using the REDS data of NCAER already discussed:

- Land reform has not led to inefficient small holdings, but instead has led to higher asset accumulation in states that underwent more land reform, higher income growth, and higher educational attainments of children.
- Land rentals have steadily declined, and are unlikely to become a major avenue for the aggregation of large farms. Instead (i) land rental has been an important avenue for land access for poor, land scarce and landless households, and therefore has supported poverty reduction in an environment with limited rural-urban migration options. (ii) Those who rent in land obtain higher returns to their labor than available in the casual labor market. (iii) State level land rental restrictions reduce the ability of the poor to get access to land and their productivity.
- Land sales markets transferred land to more efficient producers who increased their incomes. However village weather shocks encouraged distress sales by poor households. Where employment guarantee schemes were operating, they reduced such distress sales, and MGNREGA will reinforce this mechanism. With such safeguards in place, constraints on land sales among land reform beneficiaries and in tribal areas can be safely eliminated.
- Amendments in the Hindu Succession Act that give equal rights to sons and daughters to inherit land significantly increased women's probability of inheriting land, although it did not bring about full gender equality. Girls raised by women who had inherited land had significantly higher levels of education than those raised by women not subject to the amended Act. In a feminizing agriculture, women's rights to inherit land is an even more important.
- Computerizing registration of deeds and/or textual records is fully or partly completed in AP, GU, KA, MA, RJ, and TN. Computerization of textual records was facilitated through private sector contracting. In Maharashtra, computerizing registration of deeds has been associated with a 50% increase in the number of registered transfers. Stamp duty collected during the same period has more than doubled. Land transactions in sales and rental markets have been simplified and made more secure. The better land records will also make it easier to use small parcels of highly valuable land as collateral for loans to finance investments in agriculture and in the non-agricultural sector.
- In tribal areas individual or community land rights are neither recorded nor can they be transacted. There is also no system of land administration for traditionally 'marginal' lands. In tribal areas land administration should first focus on the registration of communal tenure and eventually of individual tenure, if the communities decided in an open and transparent vote to move to private property. This is the approach that is now used in Mexico and other countries. Improved land administration would ensure greater security of tenure and facilitate rental and sales to enable tribal populations to obtain the same benefits associated with landownership as other farmer groups.

The key recommendations resulting from these studies are as follows:

Consider further provision of land to landless and land poor people

Eliminate remaining constraints on land rental

Strengthen land inheritance rights for women

Clarify and record rights in marginal areas traditionally outside the system, and tribal areas, including by recognizing and recording communal tenure, and by systematically resolving conflicts

Further Improve land administration in rural areas via computerization and spatial records.

Source: Deininger and Nagarajan (2011).

to consumers; has become a major source of new technology, including GMOs, and seeds supplies; has entered agricultural extension in a significant way, via contract farming and in input supply; is providing piped water in canal systems to irrigators; has entered the agricultural credit via contract farming and microfinance; and is assisting in the administration of land record systems. NGOs have also entered agricultural extension, natural resources management, fostering of linkages of farmers to market opportunities, and micro-finance. Opportunities for public-private partnerships and partnerships with the private sector and with NGOS are therefore growing significantly, and need to be mobilized much better.

The big changes that will come about in agriculture and its environment cannot be managed just by small adjustment in existing institutions, policies and programs. In Centennial Group, (2012), a full set of bold recommendations is spelled out that would help bring about the optimistic vision for agriculture. Here we conclude with an overview of how the policy and institutional environment could look like in the 2020s and 2030s, if these recommendations were implemented.

Accelerating investment and productivity growth, and maintaining income parity in agriculture will require much accelerated technical change, further diversification to high valued crops, continued growth of irrigation, and further diversification of farmers to the non-farm sector. Agricultural research will continue to be provided by both the public and the private sector, with the public sector having a particularly important role in upstream technologies and in technologies with limited private appropriability such as open pollinated varieties or agronomic practices and soil conservation. The public sector will become more accountable to farmers and consumers and more efficient. As the failure to document adverse side effects of transgenic crops becomes ever more apparent, Bio-technology and transgenic crops will have become more widely accepted, and competition among private sector providers will reduce the costs of bio-tech inputs. They will therefore become a major source of total factor productivity growth.

Agricultural extension will become much more pluralistic with rapid growth of extension by input suppliers and contractors of output, via scaling up of NGO extension efforts and of mobile applications to agricultural information on technologies and practices, inputs and output markets. At the same time the public sector, via stronger support from the state levels, should be able to strengthen the ATMA model of coordination and provision of extension in much closer coordination with private sector providers. All extension providers will continue to struggle with the issue of how to provide extension to the many small and part time farmers. The challenges of how best to provide extension in rainfed farming, semi-arid and arid areas, and tribal areas will continue to preoccupy the public and NGO sectors, which should find it useful to cooperate more.

However, technical change, diversification, and continued irrigation growth may not be enough to maintain agricultural and rural incomes in line with rapidly growing urban incomes. Instead, significant financial support to farmers may be required. Current subsidies to fertilizer, electricity, water, and support to crop prices are tied to inputs and outputs. They are already large but inefficient means to transfer income to farmers and have adverse environmental impact. Reformed and more efficient subsidies, from being tied to often in kind inputs and output support, will have to shift to broad cash transfers on a per farm basis, rather than linked to products. They will include input vouchers favoring small farmers.

Existing constraints on agricultural marketing via regulated markets will have been eliminated, and marketing and value chains will have modernized at an accelerated pace from the farm to the retail outlet. Intense competition in marketing will help constrain the markups in the value chain and therefore assist in combating food inflation. Although some small and part time farmers may encounter greater marketing problems than larger and full time farmers, all classes of farmers will be able to avail themselves of better marketing options thanks to the cell phone and rising incentives of retailers and processors to ensure themselves of high quality outputs via contract farming.

Water management under canal irrigation will have shifted to more demand-driven modes of providing water in a timely and controlled manner, often via pumping and in pipes, and at much higher water use efficiencies. Groundwater irrigation as well as private pumping from canals and other water sources will continue to be the major source of irrigation growth. The problems of reliable electricity supply to both agricultural water users and rural consumers will be resolved in many states, but not without complex political problems and twists and turns. Groundwater depletion will remain a major threat in semi-arid, arid, and hard rock areas, but solutions that are responsive to the aspirations of millions of irrigators, rather than of a command and control type, will emerge in many places. Water harvesting, groundwater recharge, and drip and sprinkler irrigation will help significantly in reducing depletion. Nevertheless, command and control interventions may be required in some of the most critical watersheds.

It is hard to see how the enormous challenges of agricultural growth, natural resources management, and social services for rural areas could be resolved without greater citizen empowerment and decentralization. Such reforms have been under discussion in India for a very long time but all initiative so far have failed to bring them about. Reforms will have to be driven primarily by the states, but with support from strong incentives and perhaps further legislative interventions provided by the Center as well. They will not come about without pressures from below. Therefore support for transformative institutions such as SHGs, farmer associations, and organizations of the poor and marginalized will have to expand. More than in other areas the possibility of continued failure to reach these policy intentions is high.

Agricultural and rural development programs of the center will be consolidated from the hundreds of central and centrally-sponsored schemes to a sharply reduced set of block grants that will provide much more flexibility for implementers at state, district, block and village levels. Many of them will also become much more empowering of the final beneficiaries who will take a much greater role in planning and implementation of the schemes. Roles and accountabilities will be clarified and strengthened, along with monitoring, evaluation and impact evaluation. As a consequence, implementation of agricultural and

rural development programs could be significantly improved, become more transparent, and less a source of corruption.

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