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**Rural Development in India:
Agriculture, Non-farm and
Migration**

by

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More than 70 percent of India's population lives in rural areas. Rural households include cultivator households, agricultural worker households, and rural non-farm households. Rural households respond to a number of market related factors. Cultivator households respond to changes in prices for the commodities they produce. They also respond to the introduction of new technology, particularly of new "high-yielding" or modern crop varieties, by experimenting and testing the merit of a new technology for their particular situation. This experimentation may or may not lead to adoption of the technology.

Rural households, both farm and non-farm, also respond to the provision of "public goods" in the form of health services and schooling services. These responses are in the form of health outcomes and of investment in the schooling of children.

Perhaps the most important response mechanism for rural households is the response to non-farm employment opportunities. These employment opportunities may be located in rural areas, where many rural households respond by undertaking both farm and off-farm work through rural-rural migration, or they may be located in urban industrial centers where rural households respond through rural-urban migration. Both cultivator and agricultural worker households respond to these employment opportunities (and, when rural based industries are developed many households are rural-non-farm households).

Farm prices, while subject to some year to year variation, have generally declined in world commodity markets relative to prices in other economic sectors. This decline in farm prices has averaged almost one percent per year over the past 50 years. Total Factor Productivity (TFP) measures indicate that in virtually all OECD countries, TFP growth in agriculture (note, TFP growth measures the rate of reduction in average costs of producing farm goods) has been roughly one percent higher than for the rest of the economy. In developing countries TFP growth has been quite uneven. Some countries have had little TFP growth in agriculture or industry. Some have had TFP growth in agriculture, but not in industry. And some developing countries including India have had TFP growth in both agriculture and industry (and services).

Industrial TFP growth generally doesn't occur until countries establish R&D capacity in at least some producing firms. While many countries facilitate the acquisition of technology via Foreign Direct Investment policies (including encouraging the foreign firm to establish R&D capacity in the host country) some industrial development is based on household enterprises that "grow" into industrial firms. These processes are particularly important for rural-based industries.

The combination of TFP growth in agriculture and non-farm employment growth is essential to any escape route from the mass poverty endemic in India and many other low income countries. Some countries have achieved significant agricultural exports, but most agricultural commodity markets are characterized by low income (and price) elasticities of demand. And agricultural subsidy programs in most OECD countries effectively mean that developing countries have limited access to these markets (except for tropical products.)

Indian experience since independence in 1947 is generally consistent with these patterns. India adopted the East European (and Latin American to some extent) development philosophy of "industry primacy". Industrial support programs have dominated Indian plans and GOI budgets. India did recognize the importance of food production in the late 1950s and 1960s. The GOI's response to rapid

population increases led to the support of a very effective agricultural research and extension system (see Part I for a review) and the realization of a Green Revolution.

India did not pursue the “exploiting foreigners” route through openness and encouragement of Foreign Direct Investment. This strategy was effectively pursued by India’s Southeast and East Asian neighbors (particularly Indonesia).

India went through a long phase of “inwardness” based on the fear of “being exploited by foreigners” until the reforms of the early 1990s. But, a by-product of this inwardness strategy was a policy of achieving efficiency in producing a broad range of goods in India. And this strategy entailed building R&D capacity in producing firms.

India is now reaping benefits from its inwardness strategy because of the science and technology policies associated with inwardness. Yes, the benefits are late and the strategy was sub-optimal (India paid the price in the form of the slow “Hindu rate of economic growth”.) But they are nonetheless being realized. The question at hand is how this “late” industrialization is affecting rural development.

After the introduction of economic reforms in 1991, there have been significant changes in rural development in India. Official poverty ratios show significant declines from 37.1 percent in 1993-94 to 26.8 percent in 1999-00. The evidence on real agricultural wages, per capita expenditure and state domestic product is also in line with poverty trends. However, regional disparities in poverty, state domestic product, etc. have increased significantly in the 1990s (see Srinivasan 1999, Ahluwalia, 2000 and Deaton and Dreze 2002). Southern and western regions have done much better than the northern and eastern regions. Poverty decline has been slow in some of the states in the latter regions. Also, economic inequality increased within states and between urban and rural areas. On the social sector, there have been achievements in education sector –increase in literacy and enrolment rates while the decline in infant mortality has not been satisfactory.

Our paper is organized as follows:

In Part I we summarize a study of agricultural growth associated with the Green Revolution in India.

In Part II we assess data on migration and rural non-farm employment.

In Part III we estimate determinants of rural-rural migration and rural non-farm employment, utilizing National Sample Survey data at the household level.

In Part IV, we discuss policies needed for higher agricultural growth and rural non-farm employment.

PART I. CROP GENETIC IMPROVEMENT IN INDIA

A recent study of the Green Revolution in India by Evenson and McKinsey (2003) analyzed determinants of the diffusion of high-yielding or modern crop varieties for the major cereal crops, wheat, rice, maize, sorghum and millets. The analysis was based on District data for the 1957-58 to 1994-95 period.

The study treated four variables as endogenous variables:

- Area: Measured as the share of cropped area planted to the crop in the District. The share specification was required to make the variable independent of District size and commensurate with other variables in the model.
- HYV: Measured as the percent of the crop planted to "modern" high yielding varieties (i.e., varieties released after 1965). This variable measures the displacement of traditional (pre-1965) varieties by modern varieties. It does not measure varietal turnover, i.e., the displacement of older modern varieties by newer modern varieties.
- IRR: Measured as the ratio of Gross Irrigated Area to Gross Cropped Area in the District. This variable is not crop specific.
- YIELD: Measured in Kgs harvested per hectare. In Districts where the crop is grown in more than one season, this is the yield for the multiple cropped area.

The exogenous variables in the model were:

- EXT: Index of Extension Services Supplied to State Farmers
- STRESS: Cumulated Research Stock – Based on Public Agricultural Research Expenditures
- RESSH_: Crop Share of Cumulated Research Stock
- MARKET: Number of Regulated Markets in the State
- PRCHEM: Private R & D in the chemical and seed industries in India.

Prices (P)

WAGEFERT: Rural Daily Wages/Price of Chemical Fertilizer

Weather Variables (W)

DROUGHT: Dummy Variable = 1 if Crop Yields 30 Percent or More Below Normal

JUNERAIN: June Rainfall in mm.

JUARAIN: July and August Rainfall in mm.

Climate Variables (C)

TEMP_: Normal Temperature: January, April, July, October

RAIN___: Normal Rainfall: January, April, July, October

Edaphic Variables (E)

STORIE: Index of Organic Matter Content

DMS_: Soil Type Dummy Variable 2-19

DMSLP_: Topsoil Depth Dummies 1-3

AGROB_: ICAR Agrobiological Region Dummy Variables 1-7

Trait Variables - Rice Only (TR)

AVGMOLR: Average Number of Landraces in Adopted Varieties in 1984

AVGXOLR: Average Number of Landraces in Adopted Varieties in 1984 of IARC Origin

HPRINSEC: Percent of Adopted Varieties with Host Plant Resistance to Insect Pests (1984)

HPRDISEASE: Percent of Adopted Varieties with Host Plant Resistance to Disease (1984)

HPTABSTRT: Percent of Adopted Varieties with Host Plant Tolerance to Abiotic Stresses (1984)

The study utilized exclusion restrictions to identify the model. The 3SLS estimates for each endogenous variable indicated the following:

1. Determinants of HYV Adoption

HYV adoption is accelerated by investments in agricultural extension programs, in state agricultural research programs, in private sector research in the machinery and chemical industries, and by investments in market development. For rice, where data were available for traits, the incorporation of host plant resistance traits (for insects and diseases), and host plant tolerance traits (to abiotic stresses), accelerated HYV adoption. Irrigation investment accelerated HYV adoption. (Gollin and Evenson, 1998; Rao and Evenson, 1998).

2. Determinants of Irrigation Investment

The estimates for irrigation investment showed that HYV adoption complements irrigation investment (and irrigation investment complements HYV adoption). Drought prone areas invested more in irrigation.

3. Determinants of Area Shares

Both HYV adoption and irrigation investment increased area shares for the crop. State agricultural research investments also stimulated increased shares for the cereal crops (at the expense of non-cereal crops).

4. Determinants of Crop Yields

HYV adoption and irrigation investment led to increased crop yields. Investments in both public and private agricultural research also led to increased crop yield.

Table 1.1 reports a summary of productivity impacts. The HYV adoption calculations show that for the actual levels of HYV adoption, .68 tonnes per hectare were due to HYVs (with full adoption this would be 1.24 tonnes). Both private and public research as well as public extension and markets contributed to productivity gains. (The HYV adoption variable is utilized in further analysis of rural-rural migration and rural non-farm employment in Part III.)

	Rice	Wheat	Maize	Sorghum	Pearl Millet	Total	MV Related
Yields 1965	0.85	0.84	0.93	0.58	0.49	0.75	
Yields 1994	1.80	2.06	1.62	0.85	0.80	1.60	
Area Share 1965	0.23	0.10	0.04	0.10	0.07		
Impacts on Yield							
Full HYV Adoption (98%)	1.31	1.00	1.31	1.57	0.86	1.24	
94-63 HYV Adoption	0.68	0.84	0.46	0.74	0.41	0.68	
State Research (94-63)	0.092	0.179	-0.025	-0.034	0.030	0.080	0.032
Private Research (94-63)	0.003	0.0003	0.005	0.004	0.007	0.003	0.006
Extension (94-63)	0.165	0.023	0.0602	0.168	0.213	0.129	0.093
Markets (94-63)	0.004	0.021	0.092	0.107	0.027	0.032	0.069
Fertilizer	0.073	0.379	0.253	-0.022	-0.022	0.147	

The effects of HYV adoption, agricultural research and agricultural extension in crop yields are direct and indirect. The indirect effects of HYV adoption are realized through their effects on irrigation investment and area change. Indirect effects through area expansion probably have small costs associated with them. However, indirect effects through irrigation expansion are likely to have substantial costs associated with them. Thus, when HYV adoption stimulates irrigation and irrigation increases crop yields, the full effect is not attributable to HYV adoption.

PART II. TRENDS IN MIGRATION AND RURAL NON-FARM EMPLOYMENT

Migration and off-farm employment are important responses of rural households. This part examines (a) migration trends and reasons for migration and (b) trends in rural non-farm employment at the macro level. This will be useful as a backdrop to our analysis at household level in Part III.

1. Migration

The major sources of migration data are Census and NSS. We look at the migration trends during the reform period using the NSS data. The data from NSS for the past two decades show a declining trend of migration for males, both in rural and urban areas although the fall is rather modest. The percentage of migrants in rural areas has gone down from 7.2 to 6.9 during the period 1983 to 1999-00 (Table 2.1).

The pattern of inter-state, in-migration as well as out-migration, as revealed through NSS data in 1999-00, is about the same as that of the Census in 1991. The backward states like Bihar, Uttar Pradesh, Orissa, Rajasthan etc. either report net out migration or very low in-migration in 1999-00 (Table 2.2) (Also see Kundu, 2003). The developed states of Maharashtra, Punjab, West Bengal and Gujarat, on the other hand, register a high rate of in-migration. Madhya Pradesh, a less developed state reporting a medium rate of immigration, turns out as an exception.

Table 2.1 Percentage of Migrants in different NSS rounds in Rural and Urban India

Year	Rural		Urban	
	Male	Female	Male	Female
1983	7.2	35.1	27.0	36.6
1987-88	7.4	39.8	26.8	39.6
1993	6.5	40.1	23.9	38.2
1999-00	6.9	42.6	25.7	41.8

Source: Various NSS reports

Table 2.2 Migration Rates for the Major States in the 1990s

Major States	Percent Total Migrants In Rural Areas		Percent Total Migrants In Urban Areas		Net Inter-state Migrants per 1000 Persons 1999-00
	1993	1999-00	1993	1999-00	
Andhra Pradesh	9.9	10.4	26.5	30.2	1
Assam	3.0	3.1	23.0	10.4	-5
Bihar	2.2	1.0	3.8	13.3	-31
Gujarat	9.0	8.7	18.6	25.8	19
Haryana	4.2	5.8	32.0	34.1	79
Karnataka	6.6	8.0	17.6	25.3	-8
Kerala	16.6	20.9	23.3	27.2	6
Madhya Pradesh	5.0	4.7	22.8	17.8	10
Maharashtra	10.4	12.7	35.3	36.8	44
Orissa	3.6	6.8	27.6	29.6	6
Punjab	4.4	7.3	16.6	26.8	25
Rajasthan	6.2	6.4	21.1	24.7	7
Tamil Nadu	9.3	11.7	27.6	27.0	-2
Uttar Pradesh	4.6	4.6	16.3	23.0	-8
West Bengal	8.2	5.9	28.2	28.5	27

1.1 Migrants in each stream

While the rural region is one of the main areas of destination of the migrants, with especially the rural to rural flow overwhelming other streams, this proportion has dwindled between the two NSS surveys and this is true for both the sexes (Table 2.3). There has been a marginal increase in urban-urban migration. Thus, during this period, it is urban-ward migration that has increased but this is mainly on account of urban-urban flows.

Table 2.3 Migrants in each stream to total migrants in India

Migration Streams	Total		Male		Female	
	49 th	55 th	49 th	55 th	49 th	55 th
R-R	63.37	61.82	54.81	53.37	71.92	70.27
U-R	6.36	6.45	7.66	7.67	5.06	5.23
R-U	18.76	18.82	23.32	23.28	14.20	14.36
U-U	11.51	12.91	14.21	15.69	8.81	10.14

Source: NSS reports 49th Round and 55th Round

1.2 Reasons for Migration

Table 2.4 compares migration due to economic reason, separately for rural and urban areas, in 1992-93 and 1999-00.

Among rural migrants, both the proportion of males and females who gave economic reasons for mobility shows a sharp decline. Compared to 47.7 percent rural male migrants in who gave economic reasons for mobility in 1992-93, only 30.3 percent did so in 1999-00. In the case of females, compared to 8.3 percent migrants in 1992-93, only 1 percent gave economic reasons for migration in 1999-00.

In the case of urban migrants, **there is a significant increase in the percentage of male migrants reporting economic reasons for migration – from 41.5 percent in 1992-93 to 51.9 percent in 1999-00.** The percentage of males who migrated ‘in search of employment’ increased from 8 to 17 percent over this period, while the percentage of those who moved ‘in search of better employment’ and in ‘to take up employment or better employment’ increased from 12.9 percent to 15.6 percent and 6.1 percent to 9.2 percent respectively.

Table 2.4. Percentage of migrants by economic reasons for different NSS Rounds

Reason for Migration	Migrated in rural areas				Migrated in urban areas			
	Male		Female		Male		Female	
	49 th	55 th	49 th	55 th	49 th	55 th	49 th	55 th
1 in search of employment	5.2	6.4	0.5	0.2	8.6	17.0	1.3	0.7
2. in search of better employment	12.3	10.4	1.3	0.4	12.9	15.6	1.4	0.8
3. to take up employment; or better employment	20.5	6.5	5.1	0.2	6.1	9.2	1.2	0.5
4. transfer of service/contract	8.1	6.0	1.3	0.2	12.2	9.1	0.6	0.9
5. proximity to place of work	1.6	1.0	0.1	0.0	1.7	1.0	0.4	0.1
1-5	47.7	30.3	8.3	1.0	41.5	51.9	4.9	3.0

Source: NSS reports

1.3 Economic Reasons by Activity Category

The principle motive for migrants does not correspond closely to actual labor market behaviour. There are large proportion of cases in which the work status of the migrant, either before or after migration, does not correspond to motive for migration and this appears to be true irrespective of the duration of migration. Among rural migrants, for instance, only 55.4 percent of males in *regular* employment before migration gave economic reasons for migration (Table 2.5). A smaller proportion of those in other employed categories gave similar reasons. Among urban male migrants, 72 to 80 percent of those employed gave economic reasons for moving. In all cases, however, economic reasons predominated among the unemployed male migrants. Among female migrants, very small percentage of employed females gave economic reasons for migration (suggesting the predominance of non-economic reasons in their decision to move) (see Srivastava, 2003).

Table 2.5. Migrants by activity category before migration citing economic reason for migration 1999-00

Usual Activity Before Migration	Rural			Urban		
	Total	Male	Female	Total	Male	Female
Self Employed	11.3	42.6	1.2	62.1	77.1	6.2
Regular Employee	51.7	55.4	29.8	66.8	72.9	31.0
Casual Labor	15.8	47.3	4.4	60.3	80.7	18.2
Total worker	17.7	48.1	3.6	63.4	76.3	17.2
Unemployed	62	78	10.8	87.8	91.9	28.0
Not in Labor force	0.9	6.5	0.4	5.6	18.2	1.3

Source: NSS report number 470 for 55th round

1.4 Poverty and migration

Another significant conclusion emerging from the NSS data is that poverty is less of a factor in migration of males, both in rural and urban areas. The migration rate is as high as 29 percent for rural males in the highest quintile (Table 2.6) and goes down systematically to 12 percent for the lowest quintile in 1999-00.

Table 2.6: Quinquennial-wise Distribution of migrants & percentage share in total consumption

		NSS Round	Lowest quintal	Second quintile	Third quintile	Fourth quintile	Highest quintile
Rural	Male	1992-93	12.55	16.97	20.30	23.18	27.00
		1999-00	12.17	16.33	19.72	22.63	29.15
	Female	1992-93	12.78	17.21	20.58	23.18	26.24
		1999-00	13.48	17.54	20.11	22.69	26.18
Urban	Male	1992-93	10.41	17.18	21.49	23.53	27.39
		1999-00	12.02	16.32	20.42	23.51	27.72
	Female	1992-93	10.37	18.42	22.07	23.35	25.78
		1999-00	12.15	16.48	20.25	23.58	27.54

Source: NSS reports 49th and 55th Rounds.

1.5 Conclusions on Migration trends

(1) Migration rates increased during the reform period. The increase is noticed mainly from rural-urban and urban-urban.

(2) Net in-migration is higher for developed states as compared to poorer states.

(3) The percentage of migrants giving economic reasons declined for rural but increased for urban areas.

(4) Migration increased for self employed and regular employed as compared to casual labourers. It is mostly from non-agricultural sectors.

(5) The workforce participation rate among the migrant population is significantly higher after migration compared to the participation rates before migration.

(6) There is no direct relationship between poverty and migration. The migration rates are higher among the richer classes as compare to poorer classes.

2. Rural Non-farm Employment

Generating productive employment is central to sustained poverty reduction as the labor is the main asset for the majority of the poor. The relationship between poverty and employment operates through labor market, quality and quantity of employment. Rural households traditionally depended on agriculture for their livelihoods. It is now recognized that expansion of rural non-farm employment is important for improving the incomes of rural households.

Rural diversification is important for several reasons. At the economy level, the demographic pressures on land have been increasing significantly in India. With its share of 30 percent in GDP, Agriculture has to bear the burden of more than 60 percent of workers. Therefore, labor productivity has been low in agriculture. Urban areas have their own problems of demographic pressures. As a result, the rural non-farm sector becomes an escape route for agricultural workers. In order to increase wages in agriculture and to shift the workers to more productive areas, rural diversification is advocated. However, as shown below, diversification may not always benefit the poor and vulnerable sections. For example, diversification may affect the women as men shift to non-agricultural activities. Women tend to stay back in agriculture, which generally has low productivity.

There are several factors that determine the diversification in rural areas. Household or individual diversification is related to the diversification of the rural and national economy more widely. These links are determined by issues of how individuals/households access opportunity in the market place.

Earlier studies have identified several factors that determine growth in rural non-farm employment. These are: Agricultural growth, unemployment, commercialization of agriculture, urbanization, real wages, and public expenditure.¹

There has been a debate whether the diversification has been due to ‘pull factors’ or ‘push factors.’ It is generally believed that if the diversification is due to higher agricultural growth, the pull factors may be operating in the economy. On the other hand, if it is distress related diversification, the push factors seem to be more important in explaining the diversification. Vaidyanathan (1986) forwarded the idea of ‘residual sector’ hypothesis. His study has shown a significant relationship between rural non-agricultural sector and unemployment rate across states in India. But, in a later study, Vaidyanathan (1994) refuted this residual sector argument because real wages were rising in the 1980s in rural areas. Also it has been noted that non-agricultural wages are higher than that for agricultural workers in rural areas (Papola, 1991).

Although the fact that on average non-agricultural workers are better-off than agricultural workers does weaken the case for the ‘residual sector’ hypothesis (see Sen, 1998). For example, a study by Mahendra Dev (1993) on Indian states has shown that it is only in a minority of states that agriculture is the sector with the highest poverty incidence. In 1987-88, agriculture was not even the sector with highest poverty at the all India level, this dubious distinction having passed on to construction.

¹ For more details on the determinants on rural non-agricultural sector , see Vaidyanathan (1986), Visaria and Basant (1993) Mahendra Dev (1993), Chandrasekhar (1993), Chaddha (1999), Unni (1996), Sen (1998), Lanjouw and Shariff (2000)

Chandrasekhar (1993) suggest much more complex non-linear relationships between agricultural prosperity and rural non-agricultural employment: increasing when villages manage to escape a stage of involution but have yet to enter a phase of sustained agricultural growth, and decreasing as they go through a phase of sustained irrigation-induced expansion in agricultural output, and increasing again in the mature green revolution phase when growth of land productivity tapers off and mechanization reduces the demand for agricultural labor. There are also problems with the argument that if wages rates are higher in non-agriculture than in agriculture this shows that the former cannot be a 'residual sector'. The problem is that any wage differential must be caused either by some barrier to entry into higher wage sector due to skill, location, contacts leading to job access or some other specificity, or be a compensation for harder work or higher expenses such as commuting.

2.1 Trends in Rural Diversification

Here we examine diversification in terms of shifts across broad sectors in rural areas for the period 1977-78 to 1999-00. While examining the trends we may have to disregard the numbers in 1987-88 because it was a drought year. Because of the drought many agricultural workers have shifted to construction and the share of non-agriculture workers particularly for females increased significantly. Table 2.7 shows that there has been diversification from agriculture to non-agriculture in rural areas. The percentage of rural non-agricultural employment increased from 16.6 percent in 1977-78 to 23.8 percent in 1999-2000 – an increase of around 7.2 percentage points over 22 years. During the same period males showed an increase of 9.4 percentage points (from 19.3 to 28.7) while females showed an increase of 2.8 percentage points (from 11.8 to 14.6 percent). In other words, the diversification for females has been much slower for females as compared to males.

Earlier studies also examined trends and causes for changes in rural non-farm employment. The stagnation in rural non-farm employment during the period 1987-88 to 1993-94 was attributed to economic liberalization in the country. Sen (1998) indicates that public expenditure in rural areas seem to be an important factor in raising rural non-farm employment till 1987-88. Due to stabilization and structural adjustment, the public expenditure declined in the early 1990 and this could be one reason for the stagnation.

Table 2.7. Broad Sectoral Distribution of Workers in Rural India (Usual Status ps+ss): 1977-78 to 1999-2000.

	Primary	Secondary	Tertiary	Rural non-agri. (cols 3+4)
	Rural Persons			
1977-78	83.4	8.0	8.6	16.6
1983	81.5	9.0	9.4	18.4
1987-88	78.3	11.3	10.3	21.6
1993-94	78.2	10.2	11.5	21.7
1999-00	76.1	11.3	12.5	23.8
	Rural Males			
1977-78	80.7	8.8	10.5	19.3
1983	77.5	10.2	12.2	22.4
1987-88	74.5	12.3	13.4	25.7
1993-94	74.1	11.3	14.7	26.0
1999-00	71.4	12.7	16.0	28.7
	Rural Females			
1977-78	88.2	6.7	5.1	11.8
1983	87.5	7.4	4.8	12.2
1987-88	84.7	10.0	5.3	15.3
1993-94	86.2	8.3	5.6	13.9
1999-00	85.4	8.9	5.7	14.6

Source: Compiled from various rounds of NSS on Employment and Unemployment

Table 2.8 provides the trends in rural employment at one digit level. It shows that for rural males, sectors like construction, trade, hotels and restaurants, transport, storage, communications showed faster growth as shown by the increase in shares. In the 1990s, the share of agriculture for males declined much faster than earlier periods. In the case of females, diversification has been slower. Still 85 percent of the females work in agriculture. However, the shares of manufacturing and services increased for females over time. The share of manufacturing increased from 5.9% in 1977-78 to 7.6% in 1999-2000.

2.2 Employment Growth

The growth rate of rural employment was around 0.5 percent per annum between 1993-94 and 1999-00 as compared to 1.7 percent per annum between 1983 and 1993-94. The daily status unemployment rate in rural areas has increased from 5.63% in 1993-94 to 7.21% in 1999-00. As shown in Table 2.12, the overall employment growth declined from 2.04 percent during 1983-94 to 0.98% during 1994-2000. Much of the decline in the growth was due to developments in two sectors viz., agriculture and community social & personal services. These two sectors accounting for 70% of the total employment have not shown any growth during the 1990s. Similar trends can be seen for growth rates of employment based on current daily status.

Table 2.8 Sectoral Distribution of workers at one digit level: Rural India, 1977-78 to 1999-00

Sectors	1977-78	1983	1987-88	1993-94	1999-00
	Rural Persons				
Agriculture & Allied	83.4	81.5	78.3	78.4	76.3
Mining & Quarrying	0.4	0.5	0.6	0.6	0.5
Manufacturing	6.2	6.8	7.2	7.0	7.4
Electricity, gas & water	0.1	0.1	0.2	0.2	0.2
Construction	1.3	1.6	3.3	2.4	3.3
Trade, hotels and restaurants	3.3	3.4	4.0	4.3	5.1
Transport, storage, communications	0.8	1.1	1.3	1.4	2.1
Services	4.5	4.9	5.1	5.7	5.2
All	100.0	100.0	100.0	100.0	100.0
	Rural Males				
Agriculture & Allied	80.7	77.8	74.6	74.0	71.4
Mining & Quarrying	0.5	0.6	0.7	0.7	0.6
Manufacturing	6.4	7.0	7.4	7.0	7.3
Electricity, gas & water	0.2	0.2	0.3	0.3	0.2
Construction	1.7	2.2	3.7	3.2	4.5
Trade, hotels and restaurants	4.0	4.4	5.1	5.5	6.8
Transport, storage, communications	1.2	1.7	2.0	2.2	3.2
Services	5.3	6.1	6.2	7.1	6.1
All	100.0	100.0	100.0	100.0	100.0
	Rural Females				
Agriculture & Allied	88.2	87.5	84.7	86.2	85.4
Mining & Quarrying	0.2	0.3	0.4	0.4	0.7
Manufacturing	5.9	6.4	6.9	7.1	7.6
Electricity, gas & water	-	-	-	-	-
Construction	0.6	0.7	2.7	0.8	1.1
Trade, hotels and restaurants	2.0	1.9	2.1	2.1	2.0
Transport, storage, communications	0.1	0.1	0.1	0.1	0.1
Services	3.0	2.8	3.0	3.4	3.7
All	100.0	100.0	100.0	100.0	100.0

Source: Visaria, 1999 and NSSO, 2000

Table 2.9: Growth of Employment: Usual Status and Current Daily Status

Industry	Usual Status: Principal and Subsidiary (% per annum)		Current Daily Status (% per annum)	
	1983 to 1993-94	1993-94 to 1999-00	1983 to 1993-94	1993-94 to 1999-00
Agriculture	1.51	-0.34	2.23	0.02
Mining & quarrying	4.16	-2.85	3.68	-1.91
Manufacturing	2.14	2.05	2.26	2.58
Electricity, gas & water supply	4.50	-0.88	5.31	-3.55
Construction	5.32	7.09	4.18	5.21
Trade	3.57	5.04	3.80	5.72
Transport, Storage & Communications	3.24	6.04	3.35	5.53
Financial Services	7.18	6.20	4.60	5.40
Community social & per. services	2.90	0.55	3.85	-2.08
Total Employment	2.04	0.98	2.67	1.07

Source: Planning Commission (2001) for Usual status estimates and Planning Commission (2002) for Current Daily Status

2.3 Elasticity of Employment

A remarkable feature of Table 2.10 is that although the employment elasticity declined in the earlier period, the decline was especially sharp in the 1990s. The employment elasticity for the economy as a whole was 0.53 in the period 1977-78 to 1983 and this declined to 0.41 in the period 1983 to 1994. The elasticity declined sharply to 0.15 during 1993-2000. Employment elasticities in agriculture and community social and personal services were zero during the same period. In the case of manufacturing it was 0.26 while in the case of services it was more than 0.50 during this period.

Table 2.10 Elasticity of Employment to GDP

Sector	Estimated elasticities		
	1977-78 to 1983	1983 to 1993-94	1993-94 to 99-00
Agriculture	0.45	0.50	0.00
Mining & quarrying	0.80	0.69	0.00
Manufacturing	0.67	0.33	0.26
Electricity	0.73	0.52	0.00
Construction	1.00	1.00	1.00
Wholesale & retail trade	0.78	0.63	0.55
Transport, storage & construction	1.00	0.49	0.69
Finance, real estate, insurance & business	1.00	0.92	0.73
Community, social and personal services	0.83	0.50	0.07
All Sectors	0.53	0.41	0.15

Source: Task Force on Employment opportunities (GOI, 2002)

2.4 Changes in Status of Workers in Rural Agriculture and Non-agriculture

Here we look at the distribution of labor force in different categories of workers in agriculture and non-agriculture. This provides an idea on whether casualisation is happening in agriculture or non-agriculture. We consider labor force to include unemployed person days. In Table 2.11 we have seen that the percentage of self-employed has been declining for rural males. However, Table 2.11 shows that the share of male self-employed declined only for agriculture while for non-agriculture it increased. In the case of regular workers, the shares for agriculture declined while it showed an increase for non-agriculture. For male casual workers, the share of agriculture increased till 1987-88 but has been stagnant thereafter. The share of male casual labor in non-agriculture increased till 1987-88 but declined in 1993-94 before showing increase in 1999-00.

Table 2.11 Distribution of Rural Labor Person Days by Categories in Agriculture and Non-agriculture (%)

Years	Self Emp. In Agri.	Self Emp. In Non-agri	Regular Agri.	Regular Non-agri	Casual Agri	Casual non-agri.	Unemployed
Rural Males							
1977-78	51.54	10.53	4.90	6.06	16.02	3.84	7.12
1983	48.84	10.94	3.87	6.76	17.22	4.86	7.51
1987-88	45.40	12.28	3.09	7.29	20.05	7.33	4.57
1993-94	46.68	12.38	1.77	7.21	20.30	6.00	5.66
1999-00	42.52	13.01	1.75	7.77	20.39	7.38	7.18
Rural Females							
1977-78	48.92	8.68	1.45	2.56	25.35	3.85	9.18
1983	48.51	7.83	1.29	2.82	25.96	4.73	8.86
1987-88	46.92	8.63	2.04	3.13	25.69	6.74	6.85
1993-94	49.56	8.26	0.87	2.61	28.70	3.91	5.22
1999-00	45.91	9.55	1.36	3.18	29.55	3.64	6.82

Source: Various Rounds of NSS on Employment and Unemployment

2.5 Employment and Education

Education is important for workers in order to get qualitative employment. This is one of the key variables for rural diversification. Literacy alone is at best only one indicator. Literacy definition covers anyone who can write their name and this means many people may be classified as literate although they may not understand simple written instructions. Unless we have these abilities for workers, the efficiency of the labor force in many occupations is likely to remain low. Table 2.15 provides the educational standards of the workers in Rural India. It shows that the % of illiterates among male workers declined from 55 percent to 40.3 percent during 1977-78 to 1999-00. For females, the corresponding numbers declined from 88.1 percent to 74.9 percent. However, even in 1999-2000, 68 percent of the rural males and 91 percent of the rural females are either illiterate or have been educated only up to primary level. In other words, less than 10 percent of the female workers have education of middle school or above

Table 2.12. Distribution of Workers (age 5 years and above) by General education category: 1977-78 and 1999-00 (%)

Category	Rural male		Rural female	
	1977-78	1999-2000	1977-78	1999-2000
Not Literate	55.0	40.3	88.1	74.9
Literate & up to primary	30.8	27.7	9.1	15.7
Middle school	8.5	15.9	1.6	5.6
Secondary & Higher sec	4.7	13.0	1.0	3.0
Graduate & above	1.0	3.1	0.2	0.7
Total	100.0	100.0	100.0	100.0

Source: NSS Rounds on Employment and Unemployment

2.6 Conclusions on Rural Non-farm Employment

The study shows that there has been diversification from agriculture to non-agriculture. During the period 1977-78 to 1999-2000, males showed an increase of 9.4 percentage points while females showed an increase of 2.8 percentages points in rural non-farm employment. In other words, the diversification has been much slower for females as compared to males. Our analysis at one digit level shows that for rural males, sectors like construction, trade, hotels and restaurants, transport, storage,

communications showed faster growth in employment. Even in terms of output, GDP in services showed faster growth in the last decade as compared to other sectors.

Casualisation of labor has been increasing over time. Shifts from regular and self employment to casual labor in agriculture and non-agriculture seem to be a survival mechanism for the bottom 40 percent of the workers. Unemployment also increased in the late 1990s. Increase in daily status of unemployment partly reflects casualisation of labor. On the positive side, real wages of casual laborers and labor productivity has been increasing.

Overall conclusion is that there has been diversification in rural areas but it has been slow particularly for females.

PART III. AN ANALYSIS OF RURAL-RURAL MIGRATION USING NSS HOUSEHOLD LEVEL DATA

3.1 Rural-Rural Migration

In this part, we examine the determinants of rural-rural migration using the NSS household level data on Employment and Unemployment for the year 1999-00. For the quinquennial rounds NSS sample is more than 100,000 households for the whole of India. As part of its round on Employment and Unemployment NSS collects a wealth of information on several variables. Regarding the schedule on migration, the households are divided into non-migrant households and households by type of migration. We have this information by occupation and social groups also. Migrants are also classified by education. NSS collects migrant data for different types of migrants, e.g., permanent migrants and migration for the last ten years. In this section, we examine the probability of rural-rural migration by different types of households (cultivators, agricultural labor households etc.), and social groups like scheduled castes and scheduled tribes, type of education (primary, secondary etc.).

We specify two variants of migration probabilities.

VARIANT I

The logistic regression is specified as

$$\text{Ln (ORR)} = a_0 + a_1 \text{DCULT} + a_2 \text{DSEMP} + a_3 \text{DAGLAB} + a_4 \text{DSCHED} + a_5 \text{MARR} + a_6 \text{DBPRIM} + a_7 \text{DPRIM} + a_8 \text{DMID} + a_9 \text{DSEC} + a_{10} \text{DPSEC} + a_{11} \text{MPCR} + a_{12} \text{EMPGR (RURAG)} + a_{13} \text{EMPGR (RURALNONAG)} \quad \text{-----1}$$

VARIANT II

$$\text{Ln (ORR)} = a_0 + a_1 \text{DCULT} + a_2 \text{DSEMP} + a_3 \text{DNAG} + a_4 \text{DSCHED} + a_5 \text{MARR} + a_6 \text{DBPRIM} + a_7 \text{DPRIM} + a_8 \text{DMID} + a_9 \text{DSEC} + a_{10} \text{DPSEC} + a_{11} \text{MPCR} + a_{12} \text{AREA (HYV)} + a_{13} \text{EMPGR (RURALNONAG)} + \text{EMPGR (URBNAG)} \quad \text{-----2}$$

Where, ORR = Odds for Rural- Rural migration

CULT = Self Employed in agriculture

SEMP = Self employed in non-agriculture

AGLAB = agricultural labourers

NAG = Non-agricultural labourers

SCHED = scheduled castes, scheduled tribes and backward castes

MARR = marriage

BPRIM = below primary

PRIM = primary

MID = middle level

SEC = secondary

PSEC = post-secondary

MPCR = Monthly per capita expenditure Rural

EMPGR (RURAG)= Employment growth between 1993-94 and 1999-00, rural agriculture

EMPGR (RURNAG)= Employment growth between 1993-94 and 1999-00, rural non-agriculture

EMPGR (URBNAG)= Employment growth between 1993-94 and 1999-00, urban non-agriculture

AREA (HYV) = Percent Area Planted to HYVs in the District 1994.

The sample observations in variant 1 are restricted to the persons of age > 15 years and the migration type is restricted to cases where the period since migration is less than 10 years. Any individual whose current usual place of residence is different from earlier place of usual residence is regarded as a migrant. (A usual place of residence is defined as a place where the member resided for more than six months). In other words anyone who has stayed in a place different from the current place, for more than six months is considered as migrant. A rural person is rural-rural migrant if his/her usual place of residence earlier was in another rural area in the state. Similarly an urban person is rural-urban migrant if his earlier place of residence was a rural area of the state.

Table 3.1 reports estimates for Rural to Rural migrants. Note that the difference between Variants I and II is that employment growth in rural agriculture at the NSS regional level (encompassing several districts) is replaced with the HYV area variable – measured at the District level. Results of Table 3.1 indicate the following:

- Being cultivators, self-employed and agriculture worker households reduces the odds of rural-rural migration;
- Being from a scheduled caste household decreases the odds of rural-rural migration. The labor market development in India has not overcome caste status barriers;
- Being married increases the odds of rural-rural migration (note we consider only males in these estimates);
- Increased schooling increases the odds of rural-rural migration;
- Higher expenditures (income) per household increase the likelihood of rural-rural migration. It shows migration is responsive to economic opportunity. It may be noted that NSS data does not capture seasonal migration. If you consider seasonal migration, poverty may be one of the important reasons for migration.

Table 3.1: Logit Estimate for Rural-Rural Migration

Variables	Dependent Variable: Migrant (in last 10 years) of type			
	Rural-Rural		Rural-Urban	
	Coeff	S.E.	Coeff	S.E.
DCULT	-1.6241	0.0439	-1.6702	0.0669
DSEMP	-0.5585	0.0454	-0.7239	0.0742
DAGLAB	-0.8267	0.0480	-0.8524	0.0677
DSCHED	-0.1622	0.0347	-0.0597	0.027
MARR	0.1627	0.0354	0.1337	0.027
DBPRIM	0.0300	0.0592	-0.2021	0.056
DPRIM	0.1684	0.0562	-0.0649	0.052
DMID	0.1586	0.0514	0.0726	0.047
DSEC	0.3093	0.0545	0.2573	0.047
DPSEC	0.3406	0.0562	0.3330	0.047
MPCR	0.5079	0.0334	0.5174	0.019
EMPGR(RURAG)	0.0383	0.0039		
EMPGR(RURNAG)	-0.0303	0.0038	-0.0210	0.059
EMPGR(URBNAG)	0.0091	0.0044	-0.0159	0.0074
AREA (HYV)			-0.1482	0.0953
Constant	-2.8986	0.0615	-2.5184	0.1147
-2 Log likelihood			14077.4	
Nagelkerke R Square			0.072	
Sample observations	Rur. Male of age>15 yrs		Rural male of age>15 yrs	
Total Number of Persons	112,683		44,748	
% of Cases	3.60%		4.0%	

For Variant I, higher growth in agricultural employment at the NSS region level (this covers 10 to 12 Districts) increases the odds of Rural-Rural migration. This attests to a vibrant agricultural labor market in the region. For Variant I, higher growth in rural non-agricultural employment decreases the odds of Rural-Rural migration. This may be reflecting off-farm work, where workers need not migrate.

For Variant II, District level HYV adoption replaces the NSS region agricultural employment growth variable. Higher levels of HYV adoption reduce the odds of Rural-Rural migration. This attests to production and employment opportunities on the farm in the District holding workers on the farm.

3.2 Non-Farm Work in Rural Areas

For non-farm work we construct a variable for males >age 15 in rural areas with non-agricultural employment. This is not the same thing as true off-farm work because the worker may not be employed in both agriculture and non-agriculture.

3.2 Logit Estimates for Rural Non-Farm Workers

Variables	Dependent Variable: Rural Non-Farm Work			
	Variant I		Variant II	
	Coeff	S.E.	Coeff	S.E.
DCULT	-3.3050	0.0232	-3.4459	0.0387
DSEMP	1.0417	0.0245	0.9174	0.0392
DAGLAB	-2.6587	0.0252	-2.8322	0.0389
DSCHED	0.0195	0.0196	0.1580	0.0333
MARR	-0.1938	0.0205	-0.1466	0.0331
DBPRIM	0.4697	0.0282	--	--
DPRIM	0.6208	0.0280	0.5773	0.0434
DMID	0.9332	0.0266	1.0050	0.0413
DSEC	1.3826	0.0315	1.4658	0.0487
DPSEC	1.9800	0.0339	2.0724	0.0541
MPCR	0.1165	0.0255	0.1360	0.0458
EMPGR(RURAG)	-0.0121	0.0026	--	--
EMPGR(RURNAG)	0.0100	0.0020	-0.0061	0.0031
EMPGR(URBNAG)	0.0064	0.0024	-0.0100	0.0041
AREA (HYV)	--	--	0.5243	0.0552
Constant	-0.0666	0.0337	-0.4286	0.0654
-2 Log likelihood	88630.88	--	357567	--
Nagelkerke R Square	0.573		0.5693	--
Sample observations	All workers of age >15		All workers of age >15	
Total Number of Persons	132426	--	59013	--
% of Cases	30.37%		22.92%	

The odds ratio for rural non-farm (RNF) employment is related to the same variables in Variants I and II of the migration specification. Results are reported in Table 3.2.

These results indicate the following:

- Cultivator households and agricultural worker households have lower odds of RNF work.
- Scheduled caste households have higher odds of RNF work (Variant II).
- Marriage decreases the odds of RNF work.
- Higher Schooling increases the odds of RNF work.
- Higher household income increases the odds of RNF work.
- Higher agricultural employment growth decreases the odds of RNF work.
- Higher RNF employment growth (Variant I) increases the odds of RNF work.
- Higher Urban employment growth (Variant I) increases the odds of RNF work.

In Variant II, we have included HYV adoption instead of employment growth in agriculture. The results show that higher HYV adoption increases the odds of RNF work and changes the sign of the RNF and Urban employment work terms. This is actually a substantial result, suggesting that the dynamism associated with HYV adoption has a significant positive impact on RNF work. This could

operate through associated factor market expansion (fertilizer, machinery) and product market expansion (processing, etc.).

PART IV. POLICY IMPLICATIONS

Our analysis in the previous sections on rural development in India shows that agricultural technology is important for raising agricultural growth. The previous sections also showed that migration was one of the mechanisms rural population used for maintaining or increasing their incomes. Agricultural growth and development of the rural non-farm sector are important for creating productive employment, which in turn reduces rural poverty.

Quality of Employment is Important: In India many people are working at low wages, with poor working conditions in agriculture and the informal sector. There are two challenges. One is to increase productivity in agriculture and the informal sector. The second challenge is to shift these workers to high productivity sectors and also create new jobs in the non-agriculture sector. The real nature of the unemployment problem is not that people are not 'employed' in some activity but that large numbers of those classified as employed are engaged in low quality employment, which does not provide adequate income to keep a family above the poverty line. The employment strategy we need, therefore, is not a strategy, which ensures an adequate growth in the volume of employment but one, which ensures a sufficient growth in quality of employment opportunities.²

Agriculture and Food Processing: Several studies have concluded that agriculture growth is pro-poor and directly helps in reducing poverty. Almost 80 percent of the rural poor are engaged in agricultural activities. However, it is important to emphasize that this is not a sector where we should expect or plan for large increases in the total number of people employed. On the contrary, the problem we face is precisely that agriculture has become a residual absorber with too many people locked into low wage employment, much of which is seasonal and characterized by considerable under-employment. Within the agricultural sector our aim should be to increase agricultural production and also diversify production so that agricultural productivity and income expand giving a boost to rural income and therefore demand for labor in rural areas. The combined effect of (a) reduced dependence of population on agriculture and (b) improved production capability of agriculture should help to increase real wages and incomes per head of those employed in the agricultural sector. The shift of population from agricultural to non-agricultural activities is a process that has occurred in all developing countries. But, this process has been much slower in India than in other countries. Some of the policies needed for higher growth in agriculture are: raising public investment in agriculture, removal of domestic and external controls on agriculture, liberalizing leasing of land, development of non-cereal crops etc. However, small farmers should be taken care of while framing policies. Although India is one of the largest producers of raw material for the food processing industry in the world, the industry is underdeveloped. Less than 25% of fruit and vegetable production is processed compared with 30% in Thailand, 70% in Brazil, 78% in the Philippines and 80% in Malaysia. The unutilized potential of food processing in India is enormous. Expansion of this sector is an ideal way of bringing industry to rural areas, expanding the value chain of agricultural production, providing assured markets for farmers enabling them to diversify into higher value horticultural crops and expanding employment by creating high quality non-agricultural work opportunities in rural areas.

² For a discussion on the avenues for improving quality employment opportunities in India, see The Report of the Prime Minister's Task Force on Employment Opportunities.

The Livestock sector

Many landless, marginal and small farmers own livestock. Development of this sector will help the poor in this sector. Supply side factors like feed and marketing are the major constraining factors in this sector.

Forestry Sector

Forestry is the second largest land use sector after agriculture. It is estimated that approximately 275 million of the rural poor in India depend on forest lands to varying degrees. For approximately 100 million people, forests (fuel wood, non-timber forest products, construction materials etc.) are the main source for sustaining livelihoods and generating cash income. Half of India's 70 million tribal people, the most disadvantaged sections of the society, subsist from forests. Direct dependency of a large population on forests combined with increasing pressures on an already degraded resource base is the central challenge in the sector. Joint forest management (JFM) or community forest management (CFM) has to be encouraged to arrest the degradation of natural resources.

Industry and Services

For the last 50 years, the organized industrial sector has not created work opportunities for the majority of the poor. It is the small-scale industries and informal sector, which absorbed the poor labor force. There is a need for providing enabling environment for these workers. Generally, there are three constraints for industrial sector. These three are: (a) physical infrastructure - power, water, telecom and transport; (b) Regulatory constraints - in the starting stage, day-to-day operations; (c) factor market rigidities -- land, labor and credit markets. The Governments at the center and states should attempt to relax these constraints to improve the productivity in the industrial sector. The Government should give promotional support to small-scale industries. The small industries sector do not face a level playing field vis-à-vis large industries because of innumerable market imperfection and it is necessary to take positive steps to remove or at least to mitigate these disadvantages. International experience suggests that technical assistance, market assistance and information have to be available as a package to have the desired results. Similarly, there is a large scope for diversification to services in rural areas. Here also the rural infrastructure has to be improved to create work opportunities in rural services.

Youth and Skill Improvement

Public policies on skill development have so far focused mainly at vocational training institutions. The mode of acquiring skills is not uniform. Any person who is economically active, or seeks to become one, acquires the working skills through one or more of the following modes of training: (a) hereditary skills acquired in the family; (b) on-the-job training or informal apprenticeship; (c) education relevant to work; (d) formal vocational training in an institution, and (e) retraining as the nature of work changes.

A major effort to promote literacy and more importantly to bring about improvement in skill levels of those in working age group consistent with their level of education should, therefore, have high priority.

Migration: Our analysis in the previous sections show medium to long-term migration seems to be responding to the signal of economic opportunities. Various micro studies have shown that seasonal

migration is one of the coping mechanisms of poor due to lack of employment in the local areas, particularly during droughts. The policies on rural development have to take into account both short-run and long-term migration of different sections of population.

There has been diversification of activities and migration has also helped in improving incomes of the rural population. However, regional disparities, rural and urban disparities and intra-state disparities seem to have increased in the 1990s. The challenge is how to improve the rural incomes of the backward regions. Some of the policies needed for higher growth in agriculture are: raising public investment in agriculture, removal of domestic and external controls on agriculture, liberalizing leasing of land, development of non-cereal crops, etc. Similar initiatives are needed to improve the performance of the rural non-farm sector. How does one explain the fact that whereas some states did experience significant rises in their growth rates in the 1990s by benefiting from economic reforms and thereby pushed up the all-India average growth rate, some states could not respond in a similar way? The answer lies partly in the initial or pre-reform level of social and economic infrastructure conducive to growth and partly in the rate of capital formation, physical as well as human, in the post-reform period. There is a need for improvements in physical and human infrastructure in the underdeveloped regions. Improvement in reform policies and better governance are also important for higher levels of rural development in these states.

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