Rural Non-Farm Sector in Punjab: Pattern and Access to Employment and Income

Kamal Vatta and B.R. Garg*

I

INTRODUCTION

The rural economy of Punjab, endowed with dominant but skewed agricultural base and having led the green revolution in the country since mid-1960s, is now in deep crisis. Slowing down of agricultural growth, paddy-wheat monoculture, over-exploitation of natural resources and declining profitability from farming are the major issues plaguing the economy. As many as 70 per cent of the farmers, who operate less than 10 acres of land in the state, earn less than what an average Punjabi family earns today (Sidhu, 2002). The farm household incomes, which grew at around 8-9 per cent per annum during the 1970s and 1980s, increased only marginally by 1.21 per cent per annum during the 1990s (Joshi, 2004).

There has been a growing incidence of landlessness in the state. The decline in the number of operational holdings from 11.17 lakh during 1990-91 to 9.97 lakh during 2000-01, indicates that more and more rural households now seek livelihoods outside agriculture. Another disturbing feature observed over time is the significant decline in the capacity of agriculture to absorb labour. The employment elasticity with respect to aggregate output came down from 0.54 during 1970s to 0.36 during late 1980s, presently is even less than 0.20 (Sidhu, 2002). The employment elasticity of paddy and wheat crops with respect to real wages, machine use and chemical use was found to be negative and significant. As a result, the demand for human labour in the crop sector has fallen from 479.3 million man-days in 1983-84 to 421.93 million man-days in 2000-01 (Sidhu and Singh, 2004). Thus, not only the slow down in output growth, but also its declining impact as a source of employment, has aggravated the crisis. It is increasingly being felt that agriculture, traditionally employing more than three-fourths of rural workforce, no longer holds the key to additional job creation (Adhikari, 2000).

Most of the studies relating to rural non-farm (RNF) sector generally focus on its perceived potential to absorb a growing rural labour force, to slow down rural-urban migration, to contribute to national income growth and to promote a more equitable distribution of income (Lanjouw and Lanjouw, 2001). Despite only 8.4 per cent of

the population being below the poverty line,[1] against the national average of 27.5 per cent, the number of unemployed youth in Punjab exceeds 30 lakh, out of which about 70 per cent belong to rural areas (Government of India, 2002). It is clear that without creating sufficient employment opportunities, off the farm, the objective of sustainable rural livelihoods cannot be achieved. In times of distress of low and even fluctuating seasonal and long-term unemployment in agriculture, households may benefit even from low non-agricultural earnings. For certain sub-groups of the population who are unable to participate in the agricultural wage labour market, notably women in many parts of the developing world, non-agricultural incomes offer some means of economic security (Adams, 1999).

Any successful effort towards developing a sustainable rural non-farm sector demands a thorough understanding of its nature and the factors which influence the livelihood diversification towards this sector. This paper, thus, makes an attempt to explore the RNF sector in Punjab by (i) examining the pattern of rural non-farm employment/income, (ii) identifying the characteristics which influence the access to RNF employment, and (iii) delineating the determinants of rural non-farm income of an individual worker/household. The paper has been organised in six sections. The next section gives a brief review of the RNF sector in Punjab. Details of the data sources and study design have been presented in the third section. While, the pattern of RNF employment/income has been discussed in the fourth section, the determinants of RNF employment/income have been outlined in the fifth section. The last section concludes with the policy implications.

II

A BRIEF REVIEW OF RURAL NON-FARM SECTOR IN PUNJAB

The Punjab state has witnessed a relatively rapid diversification of rural male workforce. From 1983 to 2004-05, the proportion of rural male workers engaged in RNF sector increased from 22.3 per cent to 45.3 per cent in Punjab as compared to that from 22.5 per cent to 33.5 per cent in India (Table 1). The proportion of female workforce engaged in RNF sector changed from 7.2 per cent to 10.3 per cent in Punjab and from 13.5 per cent to 16.7 per cent in India, over the same period. The period of 1999-2000 to 2004-05 witnessed very fast shift of the male labour force to the rural non-farm sector in the country; it was even faster in Punjab. The shift was more than nine percentage points in Punjab as compared to about five percentage points in the country. In case of the female labour force, the trends were opposite and as compared to three percentage point shift in India, only one percentage point shift occurred in the Punjab state. With respect to the intensity of RNF employment of male and female workers, Punjab ranked fourth and tenth, respectively, amongst the fifteen major states of India (Bhaumik, 2002).

TABLE 1. DISTRIBUTION OF RURAL NON-FARM WORKERS (USUAL STATUS: PRINCIPAL +
SUBSIDIARY STATUS) IN PUNJAB AND INDIA, 1983 to 2004-05

		Punjab		India		
NSS Round	Year	Male	Female	Male	Female
(1)	(2)	(3)	(4)	(5)	(6)
38th	1983	22.3	7.2	22.5	13.5
43rd	1987-88	30.3	8.3	25.5	15.3
50th	1993-94	31.9	7.3	25.9	13.8
55th	1999-2000	36.0	9.3	28.6	13.7
61st	2004-05	45.3	10.3	33.5	16.7

(per cent)

Source: Chadha (2002), Government of India (2006).

Almost all the sub-sectors of unorganised non-farm sector in Punjab are predominantly urban except for non-mechanised transport and have experienced an appreciable decline in the share of rural workers over time. In the state, the share of rural areas in manufacturing, retail trade and services has fallen by more than 10 percentage points since 1979-80 (Bhalla, 2002). The RNF employment opportunities could grow only by 7.3 lakh for males and 0.6 lakh for females in Punjab when compared to the total RNF employment opportunities of 221.16 lakh for males and 46.07 lakh for females generated in the country during the period 1983 to 1999-2000 (Bhaumik, 2002). The proportion of rural households deriving their major proportion of income from farming and agricultural labour declined significantly from 33.0 per cent to 28.9 per cent and from 27.7 per cent to 24.6 per cent, respectively, over the period 1993-94 to 1999-2000 (Government of India, 2001). There has been an increasing evidence of growing casualisation of rural labour force with the proportion of regular salaried and self-employed rural workers declining over time. Ghuman *et al.* (2002) emphasised that most of the RNF activities in the state had emerged out of distress and were not highly remunerative. Despite the potential of establishing agro- and food-processing industry in the state, lack of entrepreneurial skills among the rural population was cited as the major constraint in the promotion of RNF sector (Mahajan, 2002). Employment generation in the non-farm sector seems to be of utmost importance and the sector needs to be developed in a systematic and sustained manner. The strengthening of social and physical infrastructure in the rural areas and greater emphasis on imparting the vocational training to rural population can go a long way in developing the RNF sector and ensuring sustainable rural livelihoods in Punjab (Ghuman *et al.,* 2002; Mahajan, 2002).

III

DATA SOURCES AND STUDY DESIGN

The results of this study are based on the primary data collected from 315 rural households in Punjab. Multistage random sampling technique was used for selection of the sample. All the 17 districts in the state were arranged in order of

increasing proportion of rural workers in non-farm activities and were classified into low, medium and high categories of rural non-farm employment intensity[2] (RNFI). The basic idea behind such classification was to give proper representation to all such regions of varying RNF employment intensity in the sample to strengthen the relevance of findings of the study. As the study pertains to employment, the number of rural workers in a particular region was supposed to be the best criterion for deciding the number of districts to be selected from each region. The proportion of rural workers in the respective regions was 28.5, 37.7 and 33.8 per cent of the total rural workers in the state. Hence, three, four and three (a total of ten) districts were selected randomly from these three regions. The selected districts pertaining to low RNFI were Ferozepur, Faridkot and Moga, medium RNFI were Amritsar, Sangrur, Kapurthala and Hoshiarpur and high RNFI were Gurdaspur, Jalandhar and Ludhiana.

At the second stage, a block was randomly selected from each of the selected districts and then two villages were selected from each of the selected blocks, making a total sample of 20 villages. The rural households were further classified into cultivating and non-cultivating households based on whether they were cultivating land or not. The cultivating households were further divided into four categories, namely, marginal (below 1 ha), small (1 to 2 ha), medium (2 to 6 ha) and large (above 6 ha) farm households on the basis of size of the land operated. Ultimately the data were collected from 315 rural households. The number of cultivating and non-cultivating households selected in each village was almost in consonance with their respective share in the total number of rural households. The sample of cultivating households was more or less equally spread over first three size categories, viz., marginal, small and medium, while the number of large farm households selected was a little less owing to their relatively lesser number in the villages. The size-wise details of the selected sample are given in Table 2. The data for the study were collected during the period August 2005 to February 2006. The reference period of the study was 365 days or one year preceding the day of data collection from the household, i.e., 2004-05. For analysing the pattern of RNF employment and income, weights were assigned to all the five categories of rural households as per their proportion in the total number of rural households in sample villages (Table 2). The proportion of each category was determined from the preliminary lists of households prepared for every selected village before the actual selection of the sample.

TABLE 2. DETAILS OF THE STUDY SAMPLE AND WEIGHTS ASSIGNED TO DIFFERENT
CATEGORIES OF RURAL HOUSEHOLDS

Household category	Sample size	Weight assigned
(1)	(2)	(3)
A. Non cultivating	142	0.404
B. Cultivating	173	0.596
1. Marginal (0-1 ha)	41	0.167
2. Small (1-2 ha)	44	0.176
3. Medium (2-6 ha)	57	0.186
4. Large (Above 6 ha)	31	0.067
Total	315	1.00

IV

PATTERN OF RURAL NON-FARM EMPLOYMENT AND INCOME

This section is based entirely on the primary data collected from the sample households. Based on the data, a detailed analysis of the labour and workforce participation, industrial classification and employment status of the rural workers has been carried out. In addition, the importance of various sources of income in the total income of rural households has also been discussed.

Labour and Workforce Participation: The labour force participation rates (LFPR)[3] and work force participation rates (WFPR) [4] in the age group of 15 to 59 years[5] have been discussed in Table 3. On principal status[6] (PS) basis, the male LFPR of 84.2 per cent and female LFPR of 14.0 per cent was observed. On the basis of principal and subsidiary status[7] (PS+SS), the respective male and female LFPR was 86.8 per cent and 52.4 per cent. The gap in the LFPR of males on the PS and PS+SS basis was just two per cent, while that for females was almost 40 per cent. Similarly, the rate of unemployment for male and female workers was 5.1 per cent and 12.6 per cent on PS basis and 5.0 per cent and 3.4 per cent on PS+SS basis, respectively. The extent of female participation in the workforce was largely subsidiary in nature with almost 39 per cent of the rural females working as subsidiary workers. The differences in the participation rates of rural males and females might be due to withdrawal of the rural females from the labour force due to lack of sufficient employment opportunities. It was also reflected from the higher rate of unemployment for female workers (12.6 per cent) as compared to their male counterparts (on PS basis). Even if some work opportunities exist, which may largely be of distress in nature, many females prefer to stay away from the labour force doing their household chores. Rural females could participate in the work force largely as subsidiary workers and that too if they were belonging to the cultivating households. The entry of females in rural labour markets seems to be largely restricted by three factors, viz., distress nature of work, lack of cultivable land and caste.

TABLE 3. LABOUR AND WORK FORCE PARTICIPATION RATES (AGE GROUP OF 15 to 59 YEARS)
OF THE SAMPLE RURAL HOUSEHOLDS

				(per cent)
	Principal status		Principal + Subsidiary status	
Particulars	Male	Female	Male	Female
(1)	(2)	(3)	(4)	(5)
1. LFPR	84.2	14.0	86.8	52.4
2. Students	11.0	10.6	11.0	10.6
3. Others	4.8	75.4	2.2	37.0
4. WFPR	94.9	87.4	95.0	96.6
5. Unemployed	5.1	12.6	5.0	3.4

Note: Others include those who are engaged in household chores only and those not participating in the labour force due to some other reasons.

Industrial Classification and Nature of Employment of Rural Workers: On the PS basis, almost 57 per cent of the rural male workers were engaged in RNF sector, while the proportion of female workers was more than 82 per cent (Table 4). On the PS+SS basis, the respective proportions were 55 per cent and 28.5 per cent. Within the rural non-farm sector, the highest proportion of male workers (PS+SS basis) was engaged in the construction activities employing 13.7 per cent workers, followed by community, social and personal (CSP) services (11.9 per cent) and manufacturing (11.4 per cent). Another 8.9 per cent of the rural male workers were engaged in trade and 6.7 per cent in transport, storage and communication. Two least important male employment activities in the RNF sector were finance, insurance and real estate and utilities employing only 1.8 per cent and 0.6 per cent of rural workers, respectively. There was almost no difference in the pattern of employment of rural male workers on PS and PS+SS basis.

TABLE 4. DISTRIBUTION OF RURAL MALE AND FEMALE WORKERS BY INDUSTRY AT TWO-DIGIT LEVEL AMONG SAMPLE HOUSEHOLDS

				(per cent)
	Principal status		Principal + Subsidiary status	
Industry/NIC-2004	Male	Female	Male	Female
(1)	(2)	(3)	(4)	(5)
1. Agriculture (01 to 05)	43.3	17.5	45.0	71.5
2. Manufacturing (15 to 37)	11.9	17.9	11.4	11.4
3. Utilities (40-41)	0.6	-	0.6	-
4. Construction (45)	13.4	-	13.7	-
5. Trade, hotels and restaurants (50-55)	9.8	0.9	8.9	0.7
6. Transport, storage and communication (60-64)	7.2	-	6.7	-
7. Finance, insurance and real estate (65-74)	1.9	-	1.8	-
8. Community, social and personal services (75-99)	11.9	63.7	11.9	16.4
Total	100.0	100.0	100.0	100.0

NIC-2004 means National Industrial Classification-2004.

On principal status basis, the female workers were largely concentrated in the non-farm sector due to inadequate employment opportunities for them in the agriculture sector. Agriculture provided employment opportunities of the female workers only as a subsidiary worker for rearing the milch animals. As a result, the employment pattern of female workers was completely reversed on the PS+SS basis when compared to the PS basis alone. In the non-farm sector, only three sub-sectors, viz., CSP services, manufacturing and trade provided employment opportunities to rural females. While the proportion of female workers employed in these sub-sectors was 63.7 per cent, 17.9 per cent and 0.9 per cent on the PS basis, it was 16.4 per cent, 11.4 per cent and 0.7 per cent, respectively on the PS+SS basis. The rural female employment seemed more diversified compared to the rural male employment. The pattern of female employment, however, indicated lack of employment opportunities, especially in construction, transport and trade which have traditionally been male-dominated activities.

The employment status of the rural male and female workers has been presented in Table 5. The workers were classified into three categories, viz., self-employed, regular salaried and casual workers. In the farm sector, majority of the male and female workers were self-employed. The self-employment involved either crop production or rearing milch animals or both. While the males were self-employed largely in the crop production activities, the females kept themselves employed in rearing milch animals. It is worth mentioning here that the migrant labour in agriculture has had a major impact on permanent employment of the rural workers in Punjab, over time. The farmers prefer the migrant workers to the local workers due to their availability for longer hours for work, relatively lower salaries and submissive behaviour due to obvious reasons. Sidhu *et al.* (2007) have estimated that almost 56 per cent of the farmers employed the migrants as a permanent worker. As a result, agriculture has almost ceased to provide regular salaried employment to the local landless workers as was happening in the past.

TABLE 5. EMPLOYMENT STATUS OF RURAL WORKERS AMONG SAMPLE HOUSEHOLDS

		(per cent)
Employment status	Male	Female
(1)	(2)	(3)
A. Farm sector		
1. Self-employed	64.4	88.3
2. Regular salaried	7.5	1.5
3. Casual worker	28.1	10.2
Total	100.0	100.0
B. Non-farm sector		
1. Self-employed	29.8	42.8
2. Regular salaried	39.6	49.9
3. Casual worker	30.6	7.3
Total	100.0	100.0
C. Overall (farm and non-farm sector)		
1. Self-employed	45.3	75.5
2. Regular salaried	25.2	15.1
3. Casual worker	29.5	9.4
Total	100.0	100.0

Of the rural female farm workers, 88.3 per cent were self-employed in agriculture, 1.5 per cent were regular salaried and 10.2 per cent were casual workers. It was perhaps due to very little regular salaried and casual employment opportunities for females in the farm sector. Within the RNF sector, the employment status was more evenly distributed. While the proportion of non-farm male workers engaged in self-employment, regular salaried and casual employment was 29.8 per cent, 39.6 per cent and 30.6 per cent and for females it was 42.8 per cent, 49.9 per cent and 7.3 per cent, respectively. There were two important observations; one, majority of the RNF workers (both males and females) were regular salaried; two, the proportion of casual female workers was much less. Regular employment in RNF sector was a healthy sign as it provided a regular source of income. It was also the preferred mode of employment and was less dependent on the asset ownership of the households as compared to the self-employment activity.

Rural Households and their Sources of Income: This sub-section highlights the access of rural households to various sources[8] of income. It is significant to note that the RNF sector, which largely goes un-noticed or neglected for its contribution to the rural economy, was found to contribute towards the incomes of 69.7 per cent of the rural households (Table 6). This proportion was even higher than 62.3 per cent of the rural households deriving income from farming. The proportion of households deriving income from agricultural labour was 28.7 per cent. Even transfer income and rental income[9] accrued to 35.8 per cent and 12.1 per cent of rural households, respectively. All the cultivating households derived their income from farming, obviously, due to their access to cultivable land, while the proportion of non-cultivating households having access to income from farming was just 44.4 per cent. The non-cultivating households had considerably higher dependence on agricultural labour and non-farm sector as their source of income.

TABLE 6. OVERALL ACCESS TO VARIOUS SOURCES OF INCOME BY THE SAMPLE RURAL HOUSEHOLDS

| Source of income | Per cent households | | |
| | Non-cultivating | Cultivating | Overall |
(1)	(2)	(3)	(4)
1. Farming	44.4	100.0	62.3
2. Agricultural labour	38.7	7.6	28.7
3. Non-farm sector	83.1	41.4	69.7
4. Transfer income	39.4	28.3	35.8
5. Rental income	12.0	12.3	12.1
Average number of income sources per household	2.18	1.90	2.09

An average rural household had access to more than two income sources; the number being even larger for the non-cultivating households when compared to the cultivating households. Almost 70 per cent of the rural households had access to one or two sources of income (Table 7). Only 24.5 per cent of the households had access to three sources of income and 6.1 per cent to more than three sources. For the resource-rich households, multiplicity of income sources was due to better asset position and skill base, leading to further improvement in their already high incomes; while for the resource poor households with poor skill base, it was an attempt to secure their already meagre income from declining further. The fact is further strengthened by the figures corresponding to the cultivating and non-cultivating households.

TABLE 7. NUMBER OF INCOME SOURCES FOR THE SAMPLE RURAL HOUSEHOLDS

| No. of income sources | Per cent households | | |
| | Non-cultivating | Cultivating | Overall |
(1)	(2)	(3)	(4)
1. Only one	24.6	36.9	28.6
2. Two	41.6	39.4	40.8
3. Three	26.1	21.0	24.5
4. More than three	7.7	2.7	6.1
Total	100.0	100.0	100.0

A rural household may be largely dependent on a particular source of income, while at the same time deriving its income from more than one source. The information in Table 8 appears quite revealing. Contrary to the much believed notion that agriculture is the major source of rural household income,[10] the results revealed that it was true only for 37.2 per cent of the rural households, out of which 28.5 per cent of the rural households had farming and 8.7 per cent had agricultural labour as their major source of income. It was the RNF sector that appeared to be the major source of income for the largest proportion (50.7 per cent) of rural households.

TABLE 8. DISTRIBUTION OF THE SAMPLE RURAL HOUSEHOLDS AS PER THEIR MAJOR SOURCE OF INCOME

Major source of income	Per cent households		
	Non-cultivating	Cultivating	Overall
(1)	(2)	(3)	(4)
1. Self employed in agriculture (crops + livestock)	8.5	70.5	28.5
2. Agricultural labour	12.0	1.9	8.7
3. Self employed in RNF sector	18.3	6.5	14.5
4. RNF regular salaried	21.1	8.8	17.2
5. RNF casual work	27.5	1.2	19.0
6. Transfer income	10.6	6.8	9.3
7. Rental income	2.0	4.3	2.8
Total	100.0	100.0	100.0

While casual non-farm work was the major source of income for 19 per cent of the rural households, regular salaried non-farm employment and non-farm self-employment were the major sources for 17.2 per cent and 14.5 per cent of the households, respectively. For almost 12 per cent of the rural households, transfer income and rental income were their major source of livelihoods. Further investigation of the major income sources for cultivating and non-cultivating rural households clearly reveals that dependence on non-farm sector and agricultural labour as income source was inversely related to the incidence of land ownership. The cultivating households, which were economically better-off, were diversifying to the non-farm sector only with more remunerative employment opportunities.

Distribution of Rural Household Income: The extent of income earned from farming (crops and livestock), agricultural labour, non-farm activity, transfer income and rental income have been presented in Table 9. On an average, a rural household in Punjab was estimated to earn Rs. 1,35,677 per annum. The per capita rural household income, thus, turned out to be Rs. 22,242. The state level estimates of per capita income being Rs. 30,701, the estimates of our study appear in consonance as rural per capita incomes are bound to be on the lower side than the overall state level estimates. Per capita income of a non-cultivating household was Rs. 12,993 and that of a cultivating household was more than double, i.e., Rs. 27,286 per annum. A cultivating household was earning almost 2.5 times when compared to a non-cultivating household. It is a case of strong positive relationship between the land

ownership and rural household income. The major difference in the household income was due to the difference in farm income, obviously owing to land ownership. A cultivating household was earning Rs. 82,989.50 from crop production and Rs. 30,935 from livestock, while the respective figures for a non-cultivating household were nil and Rs. 5,850. The income from both these sources accounted for 63.3 per cent of the total income of a cultivating rural household, while the proportion for a non-cultivating household was just 8.3 per cent.

TABLE 9. PATTERN OF HOUSEHOLD INCOME AMONG THE SAMPLE HOUSEHOLDS

	Average income per household (Rs./annum)		
Source of income	Non-cultivating	Cultivating	Overall
(1)	(2)	(3)	(4)
1. Crop farming	-	82989.50	49461.74
		(46.1)	(36.5)
2. Livestock	5850.16	30934.81	20800.61
	(8.3)	(17.2)	(15.3)
3. Agricultural labour	5439.04	1251.39	2943.20
	(7.8)	(0.7)	(2.2)
4. Non-farm income	41413.87	41430.18	41423.59
	(59.0)	(23.0)	(30.5)
5. Transfer income	12483.91	18061.48	15808.14
	(17.8)	(10.0)	(11.7)
6. Rental income	4976.55	5417.51	5239.36
	(7.1)	(3.0)	(3.9)
Total	70163.53	180084.87	135676.64
	(100.0)	(100.0)	(100.0)
Per capita income	12,993	27,286	22,242

Figure in parentheses are per cent of the respective totals.

The overall income from farming amounted to Rs. 70262.35 per annum (both crops and dairying) and constituted 51.8 per cent of the total household income. The overall share of agricultural labour was 2.2 per cent amounting to Rs. 2943.20 per annum, the share for non-cultivating households being 7.8 per cent. A rural household was estimated to earn Rs. 41423.59 per annum from RNF sources, its overall share being quite significant at 30.5 per cent. Although the average earnings of a non-cultivating and cultivating household were almost the same, their proportion in the total household income differed significantly with the respective shares of 59.0 per cent and 23.0 per cent. Even the contribution of transfer and rental incomes could not be ignored as they contributed more than 15 per cent to the rural household incomes.

Further division of RNF income, which contributed 30.5 per cent of the household income, revealed that CSP services contributed 35.6 per cent to the total RNF income of the households (Table 10). It was followed by 20.0 per cent share of transport, 15.8 per cent of trade and 13.3 per cent of manufacturing. It further came out that finance, insurance and real estate and utilities were not very significant sources of RNF income.

TABLE 10. OVERALL INDUSTRIAL DISTRIBUTION OF RURAL NON-FARM INCOME AMONG
SAMPLE HOUSEHOLDS

Industry/NIC-2004	Average annual income (Rs./household)		
	Non-cultivating	Cultivating	Overall
(1)	(2)	(3)	(4)
1. Manufacturing (15 to 37)	5961.75	5233.95	5527.98
	(14.4)	(12.6)	(13.3)
2. Utilities (40-41)	1139.24	1245.92	1202.82
	(2.8)	(3.0)	(2.9)
3. Construction (45)	6254.53	1571.12	3463.22
	(15.1)	(3.8)	(8.4)
4. Trade, hotels and restaurants (50-55)	5927.78	6948.45	6536.10
	(14.3)	(16.8)	(15.8)
5. Transport, storage and communication (60-64)	5993.31	9830.83	8280.47
	(14.5)	(23.7)	(20.0)
6. Finance, insurance and real estate (65-74)	2026.97	1452.32	1684.48
	(4.9)	(3.5)	(4.1)
7. Community, social and personal services (75-99)	14110.29	15147.59	14728.52
	(34.1)	(36.6)	(35.6)
Total	41413.87	41430.18	41423.59
	(100.0)	(100.0)	(100.0)

NIC-2004 means National Industrial Classification-2004. Figure in parentheses are per cent of the respective totals.

The contribution of different sources of income within the RNF sector was almost similar for the non-cultivating and cultivating households. The significant difference between the two categories of rural households existed only for construction and transport, storage and communication sub-sectors. While, the construction activities were contributing 15.1 per cent of the total non-farm income of a non-cultivating household, their share was only 3.8 per cent in case of the cultivating households. The construction activities were largely casual in nature and less remunerative, being less preferred by cultivating households. On the other hand, transport, storage and communication contributed more (23.7 per cent) to the non-farm income of cultivating households as compared to the non-cultivating households (14.5 per cent). For all the other non-farm sources, the respective shares of non-cultivating and cultivating households did not differ beyond 2.5 percentage points.

An average rural household earned the highest proportion of its RNF income through regular employment activities. The share of regular employment amounted to 52.2 per cent of the total RNF income (Table 11). It was followed by 36.8 per cent share of self-employment and 10.9 per cent share of casual employment in RNF sector. After taking into consideration the proportion of casual RNF workers and the corresponding income, it comes out clearly that the casual employment activities are far less paying in the RNF sector. The reason for low productivity of casual employment was not the lower wages but extremely small number of days of work (estimated to be 123 per worker per year in this study). The phenomenon of casualisation of work is more pronounced with the non-cultivating households. The income from casual non-farm work accounted for 21.1 per cent and 4.0 per cent of the total non-farm income of a non-cultivating and cultivating household,

respectively. Human resource and asset poverty is the major reason for predominance of such casualisation of work among the landless households.

TABLE 11. STATUS-WISE DISTRIBUTION OF RURAL NON-FARM INCOME AMONG
SAMPLE HOUSEHOLDS

| Employment status | Average annual income (Rs./household) | | |
| | Non-cultivating | Cultivating | Overall |
(1)	(2)	(3)	(4)
1. Self employment	13789.77	16257.62	15260.61
	(33.3)	(39.3)	(36.8)
2. Regular government	12452.20	16540.91	14889.07
	(30.1)	(39.9)	(35.9)
3. Regular private	6478.29	6962.42	6766.83
	(15.6)	(16.8)	(16.3)
4. Casual worker	8693.62	1669.22	4507.08
	(21.1)	(4.0)	(10.9)
Total	41413.88	41430.17	41423.59
	(100.0)	(100.0)	(100.0)

Figure in parentheses are per cent of the respective totals.

V

ACCESS TO RURAL NON-FARM EMPLOYMENT AND INCOME

In this section, a detailed analysis of the determinants of access to rural non-farm employment and income has been carried out. In addition to the characteristics that influence the incidence of RNF employment and extent of income of an individual worker, the determinants of non-farm income of a rural household have also been identified.

Analytical Procedure: The incidence of employment in RNF activity (dependent variable in this case) is a binary variable indicating whether a person is employed in RNF activity or not. The determinants could thus be estimated by using the linear probability model, probit model or logit model. The linear probability model was used by Singh (2003) but had many inherent limitations such as non-normality of disturbances, heteroscedasticity, values of estimated probabilities falling outside the interval of zero and one, and very small value of R^2. Also, the assumption of linear relationship between the value of an independent variable and probability of dependent variable is not a realistic assumption (Gujarati, 1999). The probit and logit models, thus, provide better alternatives for such estimation. The major difference between the two models is the flatness of tails of their cumulative distribution functions (CDFs). Logit model has slightly flatter tails (Greene, 2002), which means that probit curve approaches the axes more quickly than the logit curve. Gujarati (1999) points out that the choice between the two methods is largely of the convenience of estimation and availability of suitable computer programmes. Logit model is slightly simpler to estimate than the probit model (Berhanu *et al.,* 2003). Hence, the logit model[11] was selected for estimating the determinants of access to RNF employment in this study.

Further, the sample of observations on RNF incomes may be termed as censored sample. It was because the information on the dependent variable, i.e., RNF income, was available only for households/individuals having access to RNF employment and not for those not-employed in RNF activity. The OLS estimates of the parameters obtained are biased and inconsistent (Gujarati, 1999; Lanjouw and Shariff, 2004). Almost without exception, it is found that the OLS estimates are smaller in absolute value than the maximum likelihood estimates (Greene, 2002). Hence the tobit model[12] was used for this purpose.

The variables assumed to influence the incidence of RNF employment and extent of such income were: Gender (dummy; male-1, female-0), Caste[13] (dummy; lower caste-1, others-0), Age (in years), Education, Household Size (in number), Land (operational area in acres), Land Productivity (of the village in Rs./acre), Periphery[14] (dummy; within the periphery of an urban settlement-1, outside-0) and WPR (worker population ratio in per cent).

Determinants of Access to Rural Non-farm Employment: Logit estimates of the determinants of access to RNF employment (on PS basis) have been presented in Table 12. Determinants such as gender, age and education at individual level; caste, household size, land and WPR at family level and nearness to the urban settlement (periphery dummy) at the higher level were found to be statistically significant in influencing the access to RNF employment. A male was found less likely to get employed in a RNF employment activity than his female counterpart. The probability of a male getting employed in a RNF activity was smaller by 0.39 than that of his female counterpart. While the probability of employment in a RNF activity increased with an increase in age of the worker, it started declining once a worker was estimated to reach the age of 46 years as indicated by the negative sign of the coefficient of the variable age-squared.[15] Before reaching this critical age, an year increase in the age of a worker improved the probability of RNF employment by 0.02. An increase in the level of education was found to improve the access to RNF employment significantly. The probability of employment in RNF sector increased by 0.06 with an increase in the level of schooling by an year.

At the household level, the probability of a lower caste worker to get employed in RNF activity was higher by 0.26 when compared to an upper caste worker. Significance of household size indicated that the chances of a worker having larger households to get employed in a RNF activity were higher. Further, an increase in WPR in the household was found to significantly influence the chances of getting employed in RNF activities. An addition to the household members improved the probability of a RNF activity by 0.03. While the probability of RNF employment decreased significantly by 0.07 due to an increase in the operational land area by an acre, it started increasing once the size of operational land crossed the limit of 25 acres (10 ha). At the higher level of variables, the results indicated that nearness to an

urban settlement raised the probability of RNF employment significantly by 0.11, while land productivity did not seem to influence such employment.

TABLE 12. LOGIT ESTIMATES OF ACCESS TO RURAL NON-FARM EMPLOYMENT AMONG
SAMPLE HOUSEHOLDS

Variable	Coefficient	Marginal effect
(1)	(2)	(3)
1. Constant	-2.52**	-
	(1.10)	
2. Gender	-1.58***	-0.39
	(0.40)	
3. Lower caste dummy	1.06***	0.26
	(0.27)	
4. Age (in years)	0.07**	0.02
	(0.035)	
5. Age-squared	-0.78e-3**	-
	(0.40)	
6. Education (Years)	0.06***	0.06
	(0.007)	
7. Household size	0.03***	0.03
	(0.01)	
8. Land	-0.07***	-0.07
	(0.013)	
9. Land-squared	0.15e-2***	-
	(0.34e-3)	
10. Land productivity	0.30e-5 ^{NS}	-
	(0.69e-5)	
11. Periphery dummy	0.12**	0.12
	(0.05)	
12. WPR	0.23 ^{NS}	0.23
	(0.14)	
Log-likelihood function	-286.07	
Restricted log-likelihood	-410.34	
Chi-square value (11 d.f.)	248.54***	
Pseudo-R^2	0.31	

***, ** and * represent significance at 1 per cent, 5 per cent and 10 per cent levels, respectively. NS implies non-significant. Marginal effects represent the change in probability of RNF employment due to a unit change in the value of explanatory variable. Marginal effects have only been calculated for the significant variables. Very small values of estimates have been presented in the exponential form. Figures in parentheses represent the standard errors.

The results can be explained in the following manner. A continuously declining employment elasticity in crop production indicates that scope for further absorption of labour force in agricultural sector seems limited unless we significantly shift the growth curve. It has severely affected the employment of male as well as female workers in agriculture. The social stigma attached to moving out of agriculture has slowed down the pace of employment diversification. While the shift of male workers to RNF jobs is not smooth due to low wages, females find no other option than to shift to these jobs (cleaning, manufacturing, etc.) in order to supplement their already small household incomes, which otherwise may climb down significantly. As RNF activities require some skills, the chances of a person to get employed increase with

age as the learning capacity of a worker increases upto some age but later it starts reducing, and hence, thinning down the chances of RNF employment significantly.

An increase in the level of education improves the human capital as well as capacity and hence the chances of employment in a RNF activity. Also, improvement in education leads to a change in priorities, which always shift away from agriculture. An increase in family size may reduce per capita income and may compel the livelihood diversification in favour of RNF employment to compensate this income loss. An increase in the size of operational area significantly raises the chances of self-employment in agriculture and hence, decreases the chances of employment in RNF activity. It somewhere underlines the distress nature of RNF employment opportunities due to which landholders generally do not prefer them. However, after the land area crosses certain limit, the chances of getting employed in RNF activity start rising. The large farm households actually comprise the richest rural households who have access to the best education, the most important pre-requisite for more remunerative RNF jobs, and also have the required financial capital to start more productive non-farm self-employment activities, which the other households may not afford to undertake due to lack of capital. It reflects the unequal access to RNF employment opportunities for different asset classes in rural areas. Finally, as urbanisation facilitates the generation of RNF employment opportunities, the persons located near urban areas are more likely to get employed in such activities.

Determinants of Rural Non-farm Income: Rural non-farm income, discussed at the worker level and at the household level, provides more detailed view of the determinants of RNF income. The determinants of RNF income of an individual worker might be influenced by the household income and hence, by its determinants at the household level. Although most of the determinants may appear to be the same, yet some additional characteristics may come out to influence the household incomes. Tobit estimates of the determinants of RNF incomes of an individual worker are given in Table 13.

Almost all the hypothesised variables except gender, land productivity of the area and periphery (dummy) were found to be statistically significant. While caste, age, education and family size positively and significantly affected an individual's non-farm income, land influenced the non-farm income in an opposite manner (i.e. negatively). A lower caste worker having almost no access to cultivable land was more likely to earn through rural non-farm sources and thus was likely to earn higher annual non-farm income of Rs. 10352 than an upper caste worker. The skills acquired by a worker improved with the age and hence an increase in age by one year was found to raise his non-farm earnings by Rs. 1,649 per annum, though this skill learning ability started reducing and hence his non-farm income started declining after the age of 50 years. As expected, education positively influenced the income as it improved the productivity of a worker and raised the RNF income of a worker by Rs. 2,957 per annum, with a year increase in the level of schooling. A worker from a

RURAL NON-FARM SECTOR IN PUNJAB: PATTERN AND ACCESS TO EMPLOYMENT 239

larger household was likely to earn additional Rs. 931 per annum of non-farm income with every unit addition to the household size. An increase in the land size might have left less time for an individual worker for non-farm work and hence lesser non-farm incomes. It was only after the operational area became quite large, reflecting much better asset position of the household, its staying capacity and preference only for highly remunerative non-farm employment, that the non-farm income started increasing. Thus, an increase in the operational land by an acre reduced the annual non-farm income by Rs. 2608 till the size of operational land reached 25 acres (10 ha), thereafter the non-farm income was likely to increase with an increase in the operational area.

TABLE 13. DETERMINANTS OF RURAL NON-FARM INCOME (PER WORKER) AMONG SAMPLE HOUSEHOLDS

Variable (1)	Coefficient (2)	Marginal effect (Rs.) (3)
1. Constant	-1337727.66*** (28297.65)	-
2. Gender	-14501.29 NS (9883.95)	-
3. Lower caste dummy	25455.90*** (8403.95)	10352
4. Age (in years)	4053.74*** (1115.69)	1649
5. Age-squared	-40.33*** (12.77)	-
6. Education (Years)	7273.09*** (752.07)	2957
7. Household size	2291.78** (1138.23)	931
8. Land size	-6074.51*** (1473.58)	-2470
9. Land-squared	125.93*** (42.94)	-
10. Land productivity	-0.63 NS (0.85)	-
11. Periphery dummy	6354.21 NS (6558.37)	-
Log-likelihood function	-7144.52	
Restricted log-likelihood	-7196.30	
Chi-square value (10 d.f.)	103.56***	

***, ** and * represent significance at 1 per cent, 5 per cent and 10 per cent levels, respectively. NS implies non-significant. Figures in parentheses represent the standard errors. Marginal effects represent the change in RNF income due to a unit change in the value of explanatory variable. Marginal effects have been calculated using the statistical software LIMDEP. Marginal effects have only been calculated for the significant variables.

At the household level, Tobit estimates of determinants of RNF incomes are given in Table 14 along with their marginal effects. The average education of workers, incidence of higher education, size of the household, operational area and WPR in the household; were found to be statistically significant determinants of RNF incomes of a household. An increase in the average schooling of workers by one year in the household increased the annual RNF income of the household by Rs. 4,810. A

household with the incidence of higher education[16] was likely to earn Rs. 46,280 more per annum of RNF income as compared to the other households. Further, an increase in the household size by a unit improved annual RNF income by Rs. 7,164. An increase in the operational area by an acre reduced RNF income by Rs. 5,419 per annum. Finally, one percentage point increase in WPR was found to improve RNF income of the rural household by Rs. 508 per annum. The analysis revealed that WPR and higher education were the most important determinants of non-farm incomes of the rural households.

TABLE 14. DETERMINANTS OF RURAL NON-FARM INCOME (PER HOUSEHOLD) AMONG SAMPLE HOUSEHOLDS

Variable (1)	Coefficient (2)	Marginal effect (Rs.) (3)
1. Constant	-178041.95[NS] (40756.95)	-
2. Caste	19018.16 [NS] (13999.59)	-
3. Age	1892.00 [NS] (1686.68)	-
4. Age-squared	-17.86 [NS] (20.62)	-
5. Workers' education	9084.54*** (1627.74)	4810
6. Incidence of higher education	87409.26*** (21760.65)	46280
7. Family size	13531.07*** (2267.50)	7164
8. Land size	-10235.44*** (2573.02)	-5419
9. Land squared	214.89*** (78.97)	-
10. Land productivity	-1.13 [NS] (1.46)	-
11. WPR	95993.52*** (11048.04)	50825
12. Periphery	2885.32 [NS] (29109.92)	-
Log-likelihood function	-2502.95	
Restricted log-likelihood	-2573.01	
Chi-square value (11 d.f.)	140.12***	

*** represent significance at 1 per cent level. NS implies non-significant. Figures in parentheses represent the standard errors. Marginal effects represent the change in RNF income due to a unit change in the value of explanatory variable. Marginal effects have been calculated using the statistical software LIMDEP. Marginal effects have only been calculated for the significant variables.

VI

CONCLUSIONS AND POLICY IMPLICATIONS

The rural non-farm sector has emerged as a major source of employment engaging 57 per cent of the male and 82.5 per cent of the female workers. A relatively larger proportion of rural households was deriving their income from rural

non-farm sector compared to the farm sector. Not only that almost 70 per cent of the rural households had access to RNF income but for almost 51 per cent of the households, it was the major source of their income. These proportions were higher than the corresponding proportions of 61 per cent and 28.5 per cent who were deriving their income from farming. Rural non-farm income constituted 30.5 per cent of the household income. Falling profitability in agriculture and almost exhausted capacity of the farm sector to further absorb the labour force appear to be the major reasons for such livelihood diversification. Community, social and personal (CSP) services followed by transport and manufacturing were the three most prominent non-farm sources of employment and income. Gender, age, education, caste, family size, operational area, WPR and nearness to the urban settlements had significant influence on the incidence of RNF employment and income. As RNF sector largely emerged as a result of pull factors or distress factors, the lower castes were more likely to diversify their livelihoods due to low-productivity of this sector. Education appeared to be the most important factor in improving access to RNF employment and income.

Finally, there are two things to be kept in mind while promoting rural non-farm sector in the state. One, access of the rural workers to this sector has to be improved by building their skill base. Two, sufficient number of employment opportunities are to be generated. Improving the level as well as quality of rural education is the best way to improve the access to rural non-farm employment. Access of the rural poor to quality education has to be improved either by complete overhaul of the public schools or through education vouchers. The government may also raise the public expenditure on education, which has since long remained below the level of three per cent of GDP and is marginally declining over time. The per capita expenditure on education in Punjab has been even less than the all India average and the state ranked 22nd among 32 states in India with respect to per capita expenditure on education (Mittar *et al.*, 2002). Further, there is need to formulate a clear policy on the vocational training of rural youth. There is need to ensure the vocational training of a person as early as he/she decides to leave schooling. The earliest action will be more rewarding as the probability of employment increases with an increase in age upto certain limit. It must be kept in mind that without rapid expansion of unskilled/semiskilled labour-intensive industry near the rural areas, progress towards poverty reduction and transition to a modern economy cannot be achieved at a faster rate (Panagariya, 2006). Being unskilled/semi-skilled in nature, relatively huge employment opportunities can be generated with far less investments, benefiting larger number of rural-poor households and rural workers. Sufficient employment opportunities can be generated for the rural people through National Rural Employment Guarantee Act. It can help reducing underemployment amongst rural casual workers, enhance income, thereby, reducing the rural income inequality and household poverty.

NOTES

1. These poverty estimates are on the basis of Uniform Recall Period (URP) consumption for the year 2004-05 (Press Information Bureau, Govt. of India, March 2007). The poverty ratio is 5.2 per cent in Punjab and 21.8 per cent in India on the basis of Mixed Recall Period (MRP) consumption for the same period.

2.   The districts with low RNF employment intensity (below 43 per cent) were Muktsar, Ferozepur, Mansa, Bathinda, Faridkot and Moga; with medium RNFI (43 to 55 per cent) were Amritsar, Sangrur, Patiala, Kapurthala and Hoshiarpur; with high RNFI (above 55 per cent) were Gurdaspur, Jalandhar, Fatehgarh Sahib, Ludhiana, Ropar and Nawanshahar.

3. A person either engaged in some economic activity or not engaged but seeking work during the reference period was classified to comprise the labour force. Labour force participation rate (LFPR) was calculated as per cent of labour force to the total population.

4. WFPR was the per cent of labour force classified as workers.

5. As the age group of 15 to 59 years largely comprises the working age group, it was more pertinent to discuss the LFPR and WFPR only of this age-group rather than that of the entire rural population.

6. The activity status on which a person spent relatively longer time (i.e. major time criterion) during the reference period of 365 days preceding the date of survey was considered as the principal status of the person.

7. A person whose principal status was determined on the basis of the major time criterion could have pursued some economic activity for a relatively shorter time during the reference period of 365 days preceding the date of survey. The status in which such economic activity was pursued was called the subsidiary economic activity status of that person.

8. In this study, the sources of income were broadly classified into five categories; Farming (which included either crop cultivation or rearing of animals or both), Agricultural labour, Non-farm sector, Transfer income and Rental income. The farming income as well as income from self-employment in RNF sector was calculated as the difference between gross revenue and the paid out costs. Agricultural labour income was the total wage income accruing during the year. RNF salaried/wage income was also the total income accruing during the year.

9. Transfer income included pensions (old age pensions, widow pensions and pensions after retiring from a service) as well as internal and external remittances. While the rental income included agricultural land rent (cash/kind), machinery-rent, non-farm rent or irrigation rent etc.

10. Major source of income was defined as the source with highest proportion (in per cent) in the rural household income.

11. The problem of RNFE in logit form was represented as $P_i = 1/(1+e^{-Z_i})$, where P_i is the probability of participating in RNFE activity and $Z_i = b_o + \sum b_i X_{ji}$, X's being the set of explanatory variables. By appropriate transformations the model can be expressed as $\log_n(P_i/(1-P_i)) = Z_i = L_i$. Here, L_i is the log of odds ratio and hence, called Logit. We cannot estimate the above function by OLS technique but by maximum likelihood procedure. For more details see Greene (2002).

12. Mathematically the Tobit model can be expressed as $Y_i = b_0 + \sum b_i X_i + u_i$ if $Y_i > 0$, otherwise $Y_i = 0$. This model can be estimated by maximum likelihood method. For more details see Greene (2002).

13. The Scheduled Castes and Backward Castes were considered as the lower caste and all the others as upper castes in the study.

14. The villages within eight kilometres of distance from the nearby town or city were considered as within periphery villages and those farther than eight kilometres as outside periphery villages in the study.

15. The level of age (X) at which the relationship got reversed has been calculated by using the formula $X = -b_1/2b_2$, where b_1 is the coefficient of age, b_2 is the coefficient of the age-squared. The size of operational land has also been calculated in the same manner.

16. Education at the senior secondary level or above was considered as the higher education in this study.

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