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Determinants of non-farm employment in Punjab: Evidence from National Sample Survey Rounds

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Abstract**—** *There is growing consensus among the social scientist that for the development of rural economy, rural non-farm sector should be thriving. The present study is an attempt to study the factors enabling the rural households of Punjab to participate in the rural non-farm activities. In the present study, the household level data of National Sample Survey Organization's employment-unemployment 50th round and 68th round is utilized. The rural households of Punjab are categorized into; self-employed, casual labourer, regular or salary earners and others in farm as well as non-farm sector. The logit regression model for both the rounds are utilised to study the factors impacting the participation as self-employed, casual labourers, and regular wage earners in rural non-farm sector. As compared to the year 1993-94, in the year 2011-12, the proportion of households earning their livelihood in rural non-farm sector has increased. Moreover, the proportion of casual labourer in rural non-farm sector has also increased. The choice of occupations among the self-employed, regular salary earners and causal labourer in the rural non-farm sector is also changing in Punjab. The factors like education, number of skilled members in the households, head's education, household belonging to developed districts significantly impacted the choice of working in rural non-farm sector of Punjab. The study recommends that with increase in investment in education and developing the infrastructure in rural areas can develop the rural non-farm sector.*

Keywords**— Determinants, Employment, Logit, Non-farm, Rural economy**

I. INTRODUCTION

Economic development as a concept is multidimensional and as a process is the result of the interplay of a multitude of factors bringing in structural changes and transformation [1]. Many economists explored the process and role of structural transformation in economic development. As development takes place, there occurs a transition from the primary sector to secondary sector and then to tertiary sector. Also, the shift takes place from the farm sector to non-farm sector as non-farm wages are usually higher than the farm wages and there is uncertainty related with farmer's income [2]–[6]. This process of structural change transforms the economies from being mainly rural, agrarian and subsistence economies to predominantly urban, industrial and capitalist economies [7]. However, the Indian growth story is unique in the sense that structural transformation bypassed the second stage and has moved on to the third stage straight way i.e., from agriculture to shift towards service sector. The share of agriculture and allied activities at current prices in India's GDP was 52

per cent in 1950-51 which has shrunk to around 20 per cent in 2020-21[8]. Whereas, the share of agriculture in employment was 60 per cent in 1993-94, it reduced to 49 per cent in 2011-2012 and 44 per cent in 2018 [9]–[11]. Agriculture in India has played a dominant role in creating employment opportunities in rural areas and with adoption of green revolution, the food production has increased significantly and India has become from food importer to food exporter [12]. The previous agriculture policies did not explicitly focus on increasing farmer's income and creating quality jobs in agriculture sector. The national sample survey in 2011-12 highlighted that one-fifth of rural households with agriculture as main occupation had family income less than the official poverty line of India [12]. Furthermore, due to number of issues like dependency on nature (rainfall, climate etc.), infrastructure and technology, pricing policy, cropping pattern and low profitability, the people starting looking for better job opportunities in other sectors [13]–[15]. Nonetheless, other sectors also have its limits in absorbing the surplus workforce. Primarily due to specific requirements to get adjusted in the activities owing to specific job requirement in secondary and service sector. Moreover, the unplanned migration from rural to urban areas puts pressure on urban infrastructure and also force low wage migrants to live in slums or in unhygienic conditions [16]. To reduce the migration from rural to urban areas and to improve the socio-economic situation of rural population in India, there is need for strong and vibrant rural economy. The vibrant rural economy is also essential to reduce income inequality and disparities. Probably due to these factors rural non-farm sector has gained momentum in India particularly in post liberalization period. Furthermore, for sustained development of rural areas, development of rural non-farm is considered as pinnacle for solving the problems of rural areas [15], [17], [18]. The development of rural economy in general and rural non-farm sector in particular depends upon varied of factors. The empirical findings on rural non-farm sector highlights that crop yield, growth and commercialisation of agriculture, distribution and size of land holdings, education level, urbanisation, demand and supply factors of goods and services produced by non-farm sector, and government policies towards the promotion of non-farm activities are among the crucial factors impacting the structure and growth of non-farm sector [17]. Among these factors, the household level factors have gained importance in the empirical literature. Probably because of geographical, cultural, socio-economic diversity in India, these factors vary from state to state and even among the states varies from district to district. Therefore, the present study is an attempt to study the factors enabling the rural households to participate in the rural non-farm activities. In particular, the motivation behind the decisions and ability of the households to participate in non-farm activities in the state of Punjab.

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 [19], [20]. Slowing down of agricultural growth, paddy-wheat monoculture, overexploitation of natural resources and declining profitability from farming are the major issues plaguing the economy [19]. 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 [19]. 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 [21]. The latest findings of 77th round of National Sample Survey Organisation also reveal that monthly average income of agricultural households of Punjab's has increased from Rs 18,059 to Rs 26,701 from 2012-13 to 2018-19 at nominal prices [22], [23]. In this income, apart from income from crop production, the income from wages /salaries/labour, leasing out land, non-farm income, livestock is included. Furthermore, by taking into account inflation and income from wages or other professions, it is evident that the farm income has not grown in the recent times [24]. 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 [25]. As per NSSO report 2003, agriculture being a loss-making enterprise, 40 per cent of Indian farmers are willing to quit if given a choice. Consequently, a trend towards rural non-farm sector is well documented in various studies [20], [26]. The distress in rural economy coupled with drug menace and unemployment situation, this is no wonder that Punjab's youth is looking for greener pastures abroad and majority of youngster moving abroad are from farming families. [27], [28]. As a result, people move from the farm sector to the non-farm sector for employment. A number of studies [7], [15], [18], [29]–

[35] have acknowledged rural non-farm sector as remedy of serious problems of poverty, unemployment and rural out-migration. Hence, movement of workers from agrarian sector to non-farm sector is usually believed to be a sign of economic growth and development. Furthermore, this transition to rural non-farm sector faces numerous challenges namely inadequate skills, education and social barriers. Therefore, a need was felt to analyse the factors of employment in non-farm sector in Punjab. Furthermore, the empirical evidences also suggest that rural non-farm activities absorb surplus labour when the potential or growth of farm sector is limited and rural non-farm sector can be response to distress driven diversification [7], [36]. Therefore, to design appropriate policy to boost rural non-farm employment it is crucial to analyse the main determinants impacting the participation in rural non-farm sector in Punjab.

II. DATA AND METHODOLOGY

The household unit level data collected by the National Sample Survey Organisation (NSSO) under its various employment-unemployment surveys (particularly of its 50th Round and 68th Round) is the main data source of the present study. The number of households of Punjab are 2045 of 50th round and 1552 households of Punjab of 68th round. In these rounds, the detailed information on household characteristics like household size, religion, social group, land holding, monthly consumption and household type was collected. Furthermore, detailed information on demographic characteristics of household's members like age, education, current employment or education status was also collected. Apart from that, particular on workers like their usual principal activity was collected. All this information has been utilised on the present analysis. In order to examine the nature of employment, rural households in Punjab were broadly categorised into four activities; which are self-employed, casual labourer, regular or salary earners and others, across farm and rural non-farm sectors. Persons who operated their own farm or non-farm enterprises or were engaged independently in a profession or trade on own-account or with one or a few partners were deemed to be self-employed in household enterprises. Moreover, persons, who were casually engaged in others' farm or rural non-farm enterprises and in return, received wages according to the terms of the daily or periodic work contract, were casual labourer. Persons who worked in others' farm or rural non-farm enterprises and in return, received salary or wages on a regular basis are categorized as regular wage/salary earners. There were differences in definition in both the rounds/years. In 50th round information on regular wage/salaried persons in rural area was not collected. Therefore, this category is missing in the present analysis for 50th round. To study the factors impacting the participation in non-farm employment of rural households, the relationship of various household's characteristics and household's head characteristics is studied for participation in non-farm activities as self-employed and then as casual labourer for information of 50th round. Later on, for information of 68th round, the regression analysis is done for various household's characteristics and household's head characteristics (as independent variables) with participation in non-farm activities as self-employed, as regular wage/salary and then as casual labourer (as dependent variable). Since the dependent variables is dummy or categorical, therefore, binomial limited dependent variable models are used. In binomial dependent choice models, Probit or Logit models are usually used in empirical analysis. The results by Probit or Logit models are approximately close and even results of one model can be deduced from another model. Furthermore, the interpretation of coefficient of Logit models/ odds ratio is relatively easy to understand, therefore logit models are utilized [37], [38]. The logit model is non-linear and it is estimated by using maximum likelihood estimation. For all the logit models, area under the Receiver Operating Characteristic (ROC) is calculated to check the validity of different models. Three threshold levels (1%, 5% and 10%) are utilised to measure the significance of various determinants on the participation of rural households in non-farm activities.

III. Results And Findings

The employment of rural households in various economic activities in Punjab has been presented in Table 1. It explores the trend of employment of rural households over the period of time, i.e. 1993-94 to 2011-12. The data reveals that the 33 percent of rural households were self-employed in the agriculture sector in 1993-94 which declined to 25.2 per cent in the state of Punjab in the year 2011-12. In the year 1993-94, around 27.7 per cent of rural households in Punjab worked as casual labourers in the farm sector and proportion of

rural households engaged as a casual labourer in the farm sector declined significantly to 13.5 per cent in Punjab, in the year 2011-12.

The proportion of rural households, who derived their income mainly from self-employment in non-agriculture was 15.6 percent in 1993-94 and 17.2 per cent of rural households in the year 2011-12. The essential feature of the self-employed is that they have the autonomy to decide how, where and when to produce; and have economic independence in respect of choice of market, the scale of operation and finance for carrying out their operation. The income of the self-employed consists of a non-separable combination of two parts: a reward for their labour and profit of their enterprise (NSSO 68th round). The activity as casual labour in non-agriculture has emerged as a significant source of employment for rural households is not a healthy development. During 2011-12, it provided employment to the 18.5 per cent rural households of Punjab. The data regarding rural households that were regular wage/salary earners was only available for 2011-12. NSSO collected this information in the 68thround only. Around 18.0 per cent of households derive their income from regular wage/salary earnings, in the year 2011-12.

It is evident from the data that the proportion of households in Punjab working in the rural non-farm activities has witnessed a considerable increase from 22.7 per cent to 35.7 per cent during 1993-94 to 2011-12. It seems that the "push factors" forced the agriculture workforce towards non-agriculture activities, leading to de-peasantisation [39]. Due to over mechanization of cultivation, demand for human labour in the farm sector has also decreased significantly ever since the late 1980s from 479 million man-days in 1983-84 to 422 million man-days in 2000-01 and further to 401 million man-days in 2009-10 [40]. An earlier study [41] had also highlighted that employment in principal crops in Punjab declined from 480 million man-days in 1983-84 to 432 million man-days in 1996-97. Clearly, there was a loss of 48 million man-days of employment during the above-mentioned period. Probably due to these factors, the proportion of rural non-farm employment has increased in Punjab. In this situation it would be interesting to study the type of jobs/occupations preferred in the rural non-farm. The top five occupations of rural households of Punjab were listed and compared, based on the information drawn from NSSO reports of 1993-94 and 2011-12 (see Table 2). In the 50th round, NSSO classified these rural non-farm sector occupations into two major categories i.e. self-employed in non-farm sector and casual labour in non-farm sector. While, in the 68th round, these occupations were classified into three major categories as self-employed in non-farm sector, casual labour in non-farm sector and regular wage/salary earning in non-farm sector. In the category of rural non-farm sector of Punjab in the year 1993-94, going by the share of self-employed workers in, top occupations were observed as (i) Merchants, Shopkeepers and Retail Traders (ii) Street Vendor, Canvassers and news Vendors(iii) Cycle Rickshaw Drivers and Rickshaw Pullers (iv)Tailors and Dress Makers and (v) Bricklayers, Stone Masons and Tile Setters (see Table 2). Whereas, for the second type of activity i.e. as casual labour in rural non-farm sector in Punjab, the top occupations were 'other' workers, construction workers, loaders and unloaders, sweepers, cleaners and the lowest proportion for Office Attendants (Peons, Daftris, etc.).

During 2011-12, Punjab's majority of the rural non-farm households were self-employed as Directors and Chief Executives. Moreover, the second-highest proportion of households opted for the occupation of Building Frame and Related Trades in Punjab. For causal labour in rural non-farm sectors, the top occupations were mining and construction workers, building structure cleaners and related trades workers. Regarding the third category of employment activity namely regular wage/salary earners, the top occupations are motor vehicle drivers and protective services workers in Punjab. It is evident from the table that choice of occupation is changing among the rural households in Punjab. Some of the occupations which were not common, later on in the year 2011-12 were chosen by a larger proportion of rural households.

The factors impacting the choice of working in rural non-farm sector are explored separately for both the years i.e. 1993-94 and 2011-12. Initially, definition of variables used in the present analysis has been explained. The variables are defined differently for both the rounds. Then the determinants of decision to participate in non-farm employment has been identified for both the rounds of NSSO. The variables for carrying out analysis are explained as follows:

First, rural non-farm employment is classified into three sub-categories a) regular salary b) self-employment c) casual labour. Therefore, rural non-farm was taken up as a decision variable (dummy variables with three

categories). Second, the independent variables are broadly classified into two main groups a) Household characteristics b) Household Head's characteristics. The potential determinants have been described in the Table 3 and 4. Independent variables such as religion, social category, dependency ratio, literacy ratio, household size, land possessed and the number of skilled members in the household were categorised as household's characteristics. While, independent variables like a female head, widow head, head age, education of head and technical education attained by head were categorised as household head's characteristics. Similarly, for the year 2011-12, Model-I associates the overall activity of self-employment (dependent variable) in the rural non-farm sector with the independent variables which are classified into Household's and Household Head's Characteristics. Moreover, the second and third model's dependent variables are wage/salary and labour in rural non-farm sector. The determinants of household's participation in rural non-farm in Punjab during 1993-94 are shown in Table 5. It is observed that in Punjab, factors such as religion, literacy ratio, size of land possessed, number of skilled members in the household and gender of head had significant impact on the access to self-employment in rural non-farm sector. Apart from this, factors such as dependency ratio, size of household, widow head, age of head and education of head were found to have insignificant effect on the participation in rural non-farm sector.

Among all the religions, the probability of participation in rural non-farm sector as self-employed was negative in the case of Sikh community. The probability of a household to participate in rural non-farm sector as self-employed was reduced by 55.6 per cent belonging to Sikh community. In Punjab, most of the Sikh families have their own land and were into agriculture which reduced the probability to access the rural non-farm sector during that mentioned period of time. Moreover, the households belonging to Schedule caste had also limited access to the activity of self-employment in rural non-farm in Punjab, during 1993-94. There were 85.2 per cent less chances to participate in rural non-farm sector as self-employed if a household belonged to Schedule caste. It is significant to note here that the literacy rate positively impacted the chances of self-employment in rural non-farm sector in Punjab.

The odds of being employed in non-farm activity as self-employed increased by more than 4 times with the increase in literacy rate by one per cent. Likewise, the probability to participate in rural non-farm sector increased by 33 per cent with one more skilled person in the household, in Punjab during 1993-94. Educated people have much more efficiency to set up and manage his/her own business as compared to illiterate person. Moreover, the determinant i.e. female head had significant negative impact on the participation of household in the activity of self-employment in rural non-farm sector. Households with female head had 62 per cent less chances to participate in rural non-farm activity of self-employment. On the other side, the model associated to other labour describes that factor like religion, land possessed by household, gender of head and education attained by head had significant negative impact on the probability of participation in rural non-farm sector as labourer in Punjab during 1993-94. Moreover, the factors such as caste, dependency ratio, literacy ratio, size of household, number of skilled members in household, widow head, head age, technical education attained by head had not any significant impact on the probability to participation in rural non-farm sector as labourer. The study has found that the chances of participation of Sikh community in labour were very low. The odds ratio indicates that there was a significant negative impact of being a Sikh on the participation in rural non-farm sector as labourer. If a household belonged to Sikh community in Punjab, there were 56.30 per cent less chances to participate in rural non-farm sector as labourer. Moreover, the size of land possessed by the household also had a significant negative impact on the involvement in rural non-farm sector as labourer. It is evident from the data that with the increase in one unit of land possessed by the household reduced the probability of participation in labour in rural non-farm sector by 48 per cent. Family members of the households with large sized land holding were occupied in the activity of cultivation. During the time period of 1993-94, mostly the activities of cultivation in Punjab were labour intensive and it was capable to absorb family labour.

Moreover, it was also found that household with female head had very low probability to get involved in rural non-farm sector as labourer. The probability of a household with female head to participate in rural non-farm sector as labourer got reduced by 61 per cent due to females in Punjab especially belonging to Jatt-Sikh community had restrictions to go outside home for work [42].It is interesting to note here that the

probability of employment in rural non-farm sector as labourer also significantly reduced with improvement in educational level of household head. In Punjab during 1993-94, if a household head was educated, there were 17.5 per cent less chance to participate in rural non-farm sector as labourer.

Thus, it can be concluded that across the various determinants of rural non-farm sector, literacy rate and number of skilled members in the households had significant positive impact on the participation as self-employed in non-farm in Punjab, during 1993-94. While, factors such as religion, land possessed and female head had significant negative influence on the participation in rural non-farm sector as self-employed. Moreover, the determinants like dependency ratio, household size, head widow, head age and head educated did not have significant impact on the participation in rural non-farm sector as self-employed. Besides this binary logistic model also explores that religion (Sikh community), land possessed and female head and educated head were the factors with a significant negative impact on the participation in labour in the rural non-farm sector.

During 2011-12, the determinants of the rural non-farm sector activities such as self-employment, wage/salary earners and casual labourer in Punjab are depicted in table 6. Thus, the participation as self-employed in rural non-farm sector in Punjab found that factors like religion, social category, household size, land owned, developed district, and educated head were the determinants which had a significant impact on the participation in rural non-farm sector. In addition to this, the prime factor which had a positive impact on the growth of the activity of self-employment in rural non-farm sector was the educated head. Hence, quality education can promote rural non-farm employment in the state. The prime need is to enhance the investment on education.

The household variables such as dependency ratio, literacy ratio, land owned, develop district had a significant impact on the engagement of a household in the rural non-farm sector as a wage/salary earner. Moreover, a variable related to household head i.e. technical education attained by the head had a significant positive influence on the participation of a household in rural non-farm sector as wage/salary earner in Punjab, during 2011-12. Whereas, some other factors like religion, social category, household size, female head, widow head and age of head and educated head did not have any significant impact on the participation of household in rural non-farm sector as wage/salary earner. Increasing the dependency ratio reduces the chances for the household to participate in the rural non-farm sector as the adult members have to look after their dependent members at home. The present study also corroborates those results. As the odds ratio reveals that the probability to join the activity of wage/salary earner reduced by 66 per cent with an increase in dependency ratio by one unit. Apart from this, the size of landholding also had a significant negative impact on the engagement of households in the activity of wage/salary earning in the rural non-farm sector. The probability to participate in wage/salary earning reduced by 35.3 per cent with the increase in one more acre of owned land.

Furthermore, among the factors that had a significant positive impact on the participation of households in rural non-farm sector, the largest significant positive impact was found of technical education attained by the head. The chances to participate by a household in the activity of wage/salary earning in rural non-farm sector increased by more than seven times with the increase in one year of technical education. In addition to that in Punjab during the 68th round of NSSO, the literacy ratio also impacted the engagement of households in rural non-farm sector positively. The probability to participate of household in the activity of wage/salary earning in rural non-farm sector increased by about 2.3 times with the increase in one per cent of literacy ratio in the household. Another significant factor that had a positive impact on the participation of households in the activity of wage/salary earning in rural non-farm sector was the developed district. The developed district provides better infrastructure that promotes the activity of production in state. It creates chances for the households to participate in rural non-farm sector. The study also found that with the improvement in level of development in the district chances to participate in the activity of wage /salary earner increased by 1.4 times in Punjab, during 2011-12. The analysis of the independent variables of the rural non-farm sector activity of casual labour in Punjab shows that the household factors like social category land owned; household head's characteristics such as female head, widow head, age of head and educated head had a significant impact on the participation of household in the activity of casual labour in rural non-farm sector. If a household belonged

to SC or BC category in Punjab there were more chances to its participation in the activity of casual labour. With the increase in the size of landholding, the chances to engage in this activity reduces significantly. The probability of households engaging in the activity of casual labour in Punjab reduced by 92.7 per cent with the increase in the size of landholding by one hectare.

The impact of household heads characteristics on participation in casual labour indicates that if a household head was female, there were about 73 per cent fewer chances to join this activity. On opposite to it, if the head of the household was a widow, the probability to participate in the activity of casual labour in the rural non-farm sector increased by about 3.4 times. Moreover, the study also found that the probability to engage in rural non-farm sector as a casual labourer reduced with the increase in age and educational level of the household head. Thus, the foregoing analysis concludes that literacy ratio, developed district and technical education attained by the head have a significant impact on the probability of households participating in the activity of wage/salary earning in rural non-farm sector.

IV. FIGURES AND TABLES

Table 1: Employment of Rural Households in Punjab in 1993-94 & 2011-12. (Percentage share in total)

Type of activity opted by Household	NSSO 50th Round (1993-1994)	NSSO 68th Round (2011-2012)
A. FARM SECTOR/ AGRICULTURE		
Self-Employed	33.0	25.2
Casual Labour	27.7	13.5
Sub-total	60.7	38.7
B. RNFS SECTOR/NON-AGRICULTURE		
Self-Employed	15.6	17.2
Casual Labour	7.1	18.5
Sub-total	22.7	35.7
C. Regular Wage/Salary earning	n.a.	18.0
D. Others	16.5	7.6
Total	100	100

Source: Unit Level Data [9], [43].

Note: The different definitions of household type have been used in the 50th round and 68th round. The type of households of regular wage/salary earning, the information was collected in 68th round only.

Table 2: Top five rural non-farm occupations of households in Punjab during year 1993-94 and 2011-12

NSSO 50th Round (1993-1994)

Self-Employed in RNFS

1. Merchants and Shopkeepers, Retail Trade
2. Street Vendors, Canvassers and News Vendors
3. Cycle Rickshaw Drivers and Rickshaw Pullers
4. Tailors and Dress Makers
5. Bricklayers, Stone Masons and Tile Setters

Casual Labour in RNFS

1. Others
2. Construction Workers
3. Loaders and Unloaders
4. Sweepers, Cleaners and Related Workers
5. Office Attendants (Peons, Daftris, etc.)

NSSO 68th Round (2011-2012)

Self-Employed in RNFS

1. Directors and Chief Executives
2. Building Frame and Related Trades Workers
3. Shop Salespersons and Demonstrators
4. Street Vendors and Related Workers
5. Building Finishers and Related Trades Workers

Casual Labor in RNFS

1. Mining and Construction Laborers
2. Painters, Building Structure Cleaners and Related
3. Fishery and Related Laborers
4. Manufacturing Laborers
5. Transport Laborers and Freight Handlers

Regular Wage/Salary

1. Motor Vehicle Drivers
2. Protective Services Workers
3. Fishery and Related Laborers
4. Electrical and Electronic Equipment Mechanics

and Fitters 5. Messengers, Porters, Door Keepers and Related Workers

Source: Unit Level Data [9], [43].

Table 3: Definition of variables utilised in the correlation and regression analysis: 50th round

	Sr. No	Variables	Definition
Model I: Dependent Variable	1	Self Employed RNF	Dummy variable: =1 if the household's Principal occupation is employment in self-employment in non-farm sector. =0 otherwise
Model II: Dependent Variable	2	Labour in RNF	Dummy variable: =1 if the household's Principal occupation is labourer in non-farm sector, =0 otherwise
Independent Variable: Household's Characteristics	3	Muslim	Dummy variable: =1 if the household belongs to Muslim religion, =0 otherwise
	4	Sikh	Dummy variable: =1 if the household belongs to Sikh religion, =0 otherwise
	5	SC	Dummy variable: =1 if the household belongs to schedule caste social group. =0 otherwise
	6	Dependency Ratio	Ratio of number of persons aged less than 14 & above 59 and family size in the household
	7	Literacy Ratio	Ratio of number of literate persons in the household and family size of the household
	8	HH Size	Total number of household members
	9	Land Possessed	Land possessed by the Household in Hectares
	10	Number skilled HH	Number of skilled members in the Household
Independent Variable: Head's Characteristics	11	Female head	Dummy variable: =1 if the household's head is female, =0 otherwise
	12	Head widow	Dummy variable: =1 if the household's head is widowed or separated, =0 otherwise
	13	Head age	Age of the household's head in years
	14	Head Educated	Dummy variable: =1 if the household's head is educated, =0 otherwise
	15	Head Technical education	Dummy variable: =1 if the household's head received any technical education, =0 otherwise

Source: Unit Level Data [9]

Table 4: Definition of variables utilised in the correlation and regression analysis: 68th round

	Sr. No	Variables	Definition
Model I: Dependent Variable	1	Self Employed Non-Farm	Dummy variable: =1 if the household's Principal occupation is employment in self-employment in non-farm sector, =0 otherwise

Model II: Dependent Variable	4	Wage/Salary	Dummy variable: =1 if the household's Principal occupation as Wages/salaries in non-farm sector, =0 otherwise
Model III: Dependent Variable	5	Labour	Dummy variable: =1 if the household's Principal occupation as labourer in non-farm sector, =0 otherwise
Independent Variable: Household's Characteristics	3	Muslim	Dummy variable: =1 if the household belongs to Muslim religion. =0 otherwise
	4	Sikh	Dummy variable: =1 if the household belongs to Sikh religion. =0 otherwise
	5	SC	Dummy variable: =1 if the household belongs to schedule caste social group. =0 otherwise
	6	BC	Dummy variable: =1 if the household belongs to backward caste social group. =0 otherwise
	6	Dependency Ratio	Ratio of number of persons aged less than 14 & above 59 and family size in the household
	7	Literacy Ratio	Ratio of number of literate persons in the household and family size of the household
	8	HH Size	Total number of household members
	9	Land Possessed	Land possessed by the Household in Hectares
	10	Develop district	Dummy=1 if the household belongs to Mohali, Ludhiana, Roopnagar, SBS Nagar/ Nawanshar, Hoshiarpur district in Punjab. =0 otherwise
	11	Less develop district	Dummy=1 if the household belongs to Fazilka /Ferozepur, Taran Taran, Gurdaspur, Amritsar Mansa district in Punjab. =0 otherwise
	11	Female head	Dummy variable: =1 if the household's head is female =0 otherwise
Independent Variable: Head's Characteristics	12	Head widow	Dummy variable: =1 if the household's head is widowed or separated =0 otherwise
	13	Head age	Age of the household's head in years
	14	Head Educated	Dummy variable: =1 if the household's head is educated =0 otherwise
	15	Head Tech education	Dummy variable: =1 if the household's head received any technical education =0 otherwise

Source: Unit Level Data [43].

Table 5: Determinants of Household's participation in rural non-farm employment of Punjab: 50th round of NSSO

Variables	RNF Employment	
	Self-Employed	Other Labour
Household Related		
Muslim	1.285	--
	(0.655)	--
Sikh	0.444***	0.437***
	(0.066)	(0.090)
SC	0.148*	--
	(0.156)	--
Dependency Ratio	0.792	1.836
	(0.249)	(0.791)
Literacy Ratio	4.027***	1.596
	(1.228)	(0.694)
HH size	1.037	0.969
	(0.041)	(0.055)
Land possessed	0.583***	0.520***
	(0.042)	(0.083)
Number skilled HH	1.330***	0.883
	(0.081)	(0.096)
Household Head Related		
Female head	0.381**	0.390*
	(0.143)	(0.211)
Head widow	1.382	0.796
	(0.432)	(0.358)
Head age	0.995	0.996
	(0.006)	(0.007)
Head Educated	1.005	0.825***
	(0.027)	(0.042)
Head Tech education	0.909	1.037
	(0.078)	(0.154)
Constant	0.174***	0.298***
	(0.061)	(0.140)
Observations	1,936	1,893
Area Under ROC	0.80	0.80

Source: Unit Level Data [9].

Note: 1. The Odds ratio are presented above and figures in parentheses are standard errors.

2. The *** p<0.01, ** p<0.05, * p<0.1 signify level of significance.

Table 6: Determinants of Household's participation in non-farm rural employment in Punjab: 68th round

Variables	Self-Employed	Wage/Salary	Casual Labourer
Muslim	0.216**	1.813	1.159
	(0.140)	(0.894)	(0.600)
Sikh	0.667***	0.929	0.956
	(0.101)	(0.142)	(0.160)
SC	0.749*	1.230	2.020***
	(0.127)	(0.208)	(0.398)
BC	1.772***	1.188	1.631*
	(0.361)	(0.256)	(0.422)
Dependency Ratio	0.613	0.340***	1.416
	(0.183)	(0.101)	(0.446)
Literacy Ratio	0.953	2.306**	1.093
	(0.350)	(0.877)	(0.399)
HH Size	1.186***	1.008	1.060
	(0.046)	(0.041)	(0.046)
Land Owned	0.306***	0.647***	0.073***
	(0.051)	(0.058)	(0.039)
Develop district	0.656**	1.379**	1.158
	(0.109)	(0.207)	(0.200)
Less develop district	--	--	--
	--	--	--
Female head	0.636	1.028	0.270***
	(0.193)	(0.283)	(0.089)
Head widow	1.085	0.906	3.377***
	(0.298)	(0.246)	(0.958)
Head age	1.001	0.999	0.976***

	(0.006)	(0.006)	(0.006)
Head educated	1.615**	1.404	0.465***
	(0.328)	(0.297)	(0.096)
Head Tech educated	0.612	7.100***	--
	(0.402)	(3.797)	--
Constant	0.223***	0.159***	0.636
	(0.094)	(0.069)	(0.281)
Observations	1,552	1,552	1,534
Area Under ROC	0.75	0.70	0.80

Source: Unit Level Data [43].

Note: 1. The Odds ratio is presented above and figures in parentheses are standard errors.

2. The *** p<0.01, ** p<0.05, * p<0.1 signify level of significance.

V. CONCLUSION

As the literature on determinants of rural non-farm sector is available with full of debate, whether the growth of rural non-farm sector is distress driven or stimulated by growth factors. So, in the present chapter, an attempt has been made to examine the impact of various determinants of rural non-farm sector in Punjab, during 1993-94 and 2011-12 with the help of regression analysis. The determinants of rural non-farm sector such as religion, dependency ratio, literacy ratio, household size, land possessed and the number of skilled family members are categorised under household's characteristics. Whereas, the variables like a female head, widow head, age of head and education of head are categorised as household head's characteristics. Literacy ratio and number of skilled members in the households had a significant positive impact on the participation of households in the activity self-employed in rural non-farm sector in Punjab, during 1993-94. While, factors such as religion, land possessed and female head had a significant negative influence on the participation of households in rural non-farm sector as self-employed. Besides this, Binary Logistic Model also explores that religion (Sikh community), land possessed and female head and educated head were the factors with a significant negative impact on the participation in labour in the rural non-farm sector. In the case of self-employment in Punjab, it was found that the key determinant which had a significant positive impact on the growth of the activity of self-employment in rural non-farm sector was educated head, during 2011-12. Moreover, the factors such as literacy rate, development district and technical education attained by the head have a positive significant impact on the probability of households participating in the activity of wage/salary earning in rural non-farm sector.

Thus, the study concludes that to promote the activities of self-employment and wage/salary earners, improvement in education and regional development through developed infrastructure are the prerequisites. Moreover, it also explored that the growth of rural non-farm sector may not be distress driven rather the development of rural areas and education promotes rural non-farm sector. Therefore, the prime need is to enhance the expenditure on education by the government.

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