Determinants of Rural Non-Farm Employment/Non-Agricultural Employment in Drought Prone Region of West Bengal: Analysis of Census Data

Dr. Chitta Ranjan Pal

Reader in Commerce, Seva Bharati Mahavidyalaya, Kapgari, Paschim Medinipur, 721505 West Bengal, India

ABSTRACT In India, as in most parts of the developing world, labour absorption in agriculture and in the urban industrial and service sectors has not been fast enough to absorb the growing disguised labour force. Consequently, despite rural-urban migration the problems of poverty, unemployment and underemployment have persisted in both rural and urban areas. Under these circumstances, diversification of the rural economy is seen as an important element of the development strategy.

The Drought Prone (DP) region is distinct from other parts of the West Bengal in terms of social composition and has a relatively high proportion of scheduled castes and scheduled tribes to total population with their own culture, language and style of living. As growth rate of agriculture sector is very poor, the non-farm/non-agricultural sector may provide better scope for employment particularly in the drought prone region of rural area.

A certain shift in occupational structure of rural workforce (both male and female) is clearly noticed in the Drought Prone (DP) districts in favour of *non-farm/non-agricultural employment. Three drought prone districts (Midnapore, Bankura and Purulia) witnessed positive growth of rural non-farm workers (RNFW) /non-agricultural workers (RNAW) during 1971 to 2011. It is also fairly established that West Bengal as a whole and the DP blocks of the state witnessed substantial variations in rural non-farm employment / non-agricultural employment (RNFE/RNAE) across districts and blocks. Therefore, some questions that arise are: What factors explain the growth as well as variation in RNFE across the DP blocks? What hypotheses are there to explain the same? Which hypothesis or hypotheses is / are important to explain the same? Which factors are dominant for the growth of RNFW/RNAW and its variation across the DP blocks and villages? The present endeavour seeks to address these questions with reference to the DP blocks of West Bengal. It can be said that there are two broad ingredients that spurt non-farm employment in rural areas. These two factors are 'Pull' and 'Push' factors. Agricultural prosperity, rural infrastructure try to pull the labour force away from agriculture towards non-farm activities while the distress factors tend to push the rural workforce to go in search of low-paid / residue jobs.

Introduction

Development of rural India has come out as a distinctive field of policy and practice and of research also. It is because of the fact that most of the poor people live in rural areas. It is now becoming fairly evident that in rural economies, typically characterised by continuing population pressure, an ever declining land-man ratio, small and fragmented agricultural land holdings, highly iniquitous land distribution structures and increasing laboursaving farm production technologies agriculture alone cannot provide the ultimate answer for rural development[1]. Therefore, the necessity for expanding the network of non-farm activities in the interest of improvement of employment, productivity and earnings is advocated as the central plank of rural development strategy[2]. There is an accumulating evidence for the significance of rural non-farm employment (RNFE) in rural development in India. It plays a positive role in the removal of poverty, generation of employment and decentralisation of urbanisation. It is important source of income to small and landless farmers during the slack season. It also facilitates structural transformation in employment and supplies non-food goods and services to rural population.

Despite the adoption of sincere efforts towards rural development and employment generation through non-farm activities the scenario has yet to change significantly. It is only recently that diversification of rural employment structure away from agriculture is clearly noticed and documented in a number of studies in India. In rural India, the general economic development programmes being imple-

mented since the beginning of the planning era, particularly the intensive agricultural development programmes were, by their design, focused on areas and farmers with complementary resources, primarily assured irrigation and soon it became clear that their benefits remained largely confined to such farmers and areas. The DP region is distinct from other parts of the state in terms of social composition and has a relatively high proportion of scheduled tribes to total population with their own culture, language and style of living.

It has been observed that overall productivity of the drought prone areas remained quite low and during the years of drought it became lowest. As a result, there is gradual and steady impoverishment among rural people, particularly among the weaker sections, namely marginal and small farmers, agricultural labourers and tribal people[3]. In a nutshell, the benefits of green revolution bypassed the drought prone area and weaker sections, namely the SCs & STs while non-farm employment opportunities are gradually expanding.

Other processes such as urbanisation and growth of rural infrastructure which emanate outside agriculture can lead to the growth of non-farm activities in the rural part of a region (Unni 1991). The growth of semi-urban centres is related to the extent of transportation facilities available between the urban centre and the rural hinterlands of the adjacent areas. If all the areas were properly connected with the urban centre, the non-farm sector in the rural ar-

eas would consistently expand. The extent and diffusion of transport facilitates growth of rural non-farm employment via different processes. Another factor outside the agriculture that matters the growth of non-farm activities is human capital including education levels, health and social networks. In particular, education is one of the more robust stylized facts affecting the access to rural non-farm activities. A number of recent studies (Islam, 1997; Lanjouw and Shariff, 1999; Viverberg, 1995) have illustrated that level of education is a very important factor determining the access to rural non-farm employment. Households with higher levels of education are expected to gain access to the better paying non-farm activities, while those who have low educational levels have access only to low paid refuge jobs.

In Indian literature there are relatively few studies available that analyse micro level data at the block level, statistically or econometrically, to understand the rational and processes of participation in RNFE (Unni 2000). We have hardly any such study concerning RNFE at block level in the drought prone (DP) region of West Bengal. Moreover, in the existing micro level studies the relationship between non-farm employment and the factors influencing RNFE has not been analysed in depth.

Objective of the Study
The objective of the present study is to identify the factors that determine the rural non-farm employment (RNFE)/ non-agricultural employment (RNAE) in Drought Prone Blocks of West Bengal

Hypotheses
Agricultural Prosperity, Infrastructural Facility and Distress factors are the determinants of non-farm activities in drought prone region of the state.

The analysis is based on secondary data collected from census data relating to DP blocks of West Bengal.

Section 1 presents the framework of testable hypotheses. Section 2 specifies variables as well as their sources in a tabular form section 3 examine the relationship between variables. Section 4 discusses the determinants of RNFE / RNAE at the block level and section 5 summaries the discussion.

1. Framework of Testable Hypotheses
At the cross sectional level at which we analyze data in the present study, it is difficult to clearly differentiate the dynamic process that leads to the growth of RNFE. The factors that affect the variation in RNFE/RNAE across the DP blocks of West Bengal are grouped into four broad categories, namely, i) agricultural prosperity, ii) infrastructural facilities and iii) distress variables.

i) Agricultural Prosperity
Agricultural prosperity in a region is specified by three indicators: a) Food grain productivity or Yield rate (FGP), b) Percentage share of non-food grain area to total cropped area (NFGA) and c) Gross cropped area per rural population (GCA).

ii) Infrastructural Facility
Rural infrastructure exerts a hypothesized regional influence upon the magnitude of NFW that is presumed to operate through the production or product supply side (Shukla, 1992). Two indicators that specify infrastructure development in a region, are a) road density (RDEN) and b) percentage of villages electrified (VELF).

iii) Distress Factors
Two distress factors used to explain distress diversification of rural workers from farm sector to non-farm sector are: a) dependency ratio (DR) defined as ratio of non-workers to total population and b) percentage of marginal farmer households to total households (MFHTH)

2. Specifications and Sources of Variables
The variables identified to capture these processes and their specifications are presented in Table 1. The source of data, mean, coefficient of variation (CV) and the notations used for the variables are listed for two distinct years (i.e., 1991 and 2001).

Table 1 Notations, Specification, Source, Mean and Coefficient of Variation in Variables used in Regression Analysis

Notation	Specification	Source	Year	Mean	CV
GCA	Gross Cropped Area per Rural Population	District Statistical Hand Book, Bureau of Applied Economics and Statistics, Government of West Bengal, BAES	1991	0.18	20.51
			2001	0.15	25.20
NFGA	Percentage of Non-Foodgrain Area to Gross Cropped Area	District Statistical Hand Book, BAES	1991	1.86	143.06
			2001	3.49	112.16
VELF	Percentage of Villages Electrified	Statistical Hand Book West Bengal, BAES	1991	0.18	97.86
			2001	0.45	49.70
RDEN	Road Density (Length of Road per Thousand Sq. Km)	Statistical Hand Book West Bengal, BAES	1991	136.38	53.57
			2001	109.71	42.03
DR	Dependency Ratio (Percentage of Non workers to Total Population)	Census of India, West Bengal	1991	0.57	11.32
			2001	0.54	11.09
MFHTH	Marginal Farmer Households to total Households (%)	District Statistical Hand Book	1991	0.37	36.46
			2001	0.38	28.22
PRNFW	Percentage share of Rural Non-Farm Workers	Census of India, West Bengal	1991	19.05	36.60
PRNAW	Percentage share of Rural Non-Agricultural Workers	Census of India, West Bengal	2001	35.88	31.23

3. Relationships between Variables

In order to have a preliminary understanding of the nature of the relationship between variables discussed earlier a correlation matrix of all the variables is constructed. Table 2 and 3 present the block level correlation matrix of variables for the year 1991 and 2001 respectively. It is seen that GCA is negatively related to proportion to rural non-farm workers (PRNFW) and the correlation coefficient (-0.37) is significant at 5 per cent level and NFGA is positively related to PRNFW and its coefficient (0.42) is significant at 5 per cent level. RDEN, VELF, MFHTH and DR are positively and significantly related to the PRNFW in 1991 and the respective correlation coefficients being 0.61, 0.47, 0.59 and 0.55. In 2001 NFGA and RDEN are significantly associated with PRNFW at 5 per cent level, the respective correlation coefficients being 0.42 and 0.39 while VELF, MFHTH and DR are positively and significantly related at 1 per cent level, the respective correlation coefficient being 0.45, 0.49 and 0.45. It may be noted here that in the DP blocks PRNFW and PRNAW are found to be insignificantly related to food grains productivity for the year 1991 and 2001 respectively.

Since the correlation only indicates the linear relationship of each variable with the percentage share of RNFW, it does not indicate the causal relationship. What we need for our purpose is regression analysis. So we switch over to regression analysis.

Table 2 Block Level Correlation Matrix, 1991

	PRNFW	GCA	NFGA	RDEN	VELF	MFHTH	DR
PRNFW	1.00						
GCA	-.37*	1.00					
NFGA	.42*	-.06	1.00				
RDEN	.61**	-.14	.64**	1.00			
VELF	.47**	-.45**	.27	.27	1.00		
MFHTH	.59**	-.41**	.29	.15	.33	1.00	
DR	.55**	-.26	.23	.46**	.52**	.14	1.00

* Indicates significant at 5 percent level and ** significant at 1 percent.

Note: PRNFW=Percentage Share of Rural Non-Farm Workers, GCA=Gross Cropped Area, NFGA=Non-Food grain Area, RDEN= Road Density, VELF= Villages Electrified, MFHTH= Marginal Farmer Household to total Households and DR= Dependency Ratio

Table 3 Block Level Correlation Matrix, 2001

	PRNAW	GCA	NFGA	RDEN	VELF	MFHTH	DR
PRNAW	1.00						
GCA	-.22	1.00					
NFGA	.42*	.12	1.00				
RDEN	.39*	-.21	.17	1.00			
VELF	.45**	-.25	-.06	.13	1.00		
MFHTH	.49**	-.02	.19	.05	.36*	1.00	
DR	.45**	-.11	.02	.51**	.52**	.11	1.00

* Indicates significant at 5 percent level and ** significant at 1 percent level

Notes: RRNAW=Percentage Share of Rural Non-Agricultural Workers and As in Table 2

4. Determinants of Rural Non-Farm Employment

This section analyses the determinants that explain the variations in PRNFW across the drought prone blocks of West Bengal for two distinct points of time, i.e. 1991 and 2001. At each point of time the cross section analysis helps us identify the factors that significantly explain the variation in PRNFW. The regressions are run separately for 1991 and 2001 to enable us to examine the stability of coefficients derived. It is to note that for 2001[1] PRNAW is the dependent variable. The results of the multiple regression equations are presented in table 5.4 for the year 1991 and 2001 respectively. It is observed that three broad factors are good fitted at district level. The adjusted R^2 and F of the estimated regression equations are such that the relevant broad factors are well fitted to the data set and it also satisfies the assumptions of normality and homoscedasticity of disturbance term and there is no multicollinearity among the explanatory variables.

Agricultural prosperity

The level of PRNFW across the DP blocks is negatively influenced by gross cropped area per rural population (GCA) and positively influenced by proportion of non-food grain area (NFGA). However, the regression parameter of GCA is statistically significant at 5 percent level both in 1991 and in 2001 while that of NFGA is significant for both years at 1 per cent level.

Commercialisation of agriculture (NFGA) directly affects PRNFW across the DP blocks, its coefficients being 1.08 for 1991 and 1.28 for 2001, both significant at 1 per cent level The whole model concerning PRNFW with independent variables GCA and NFGA indicating agricultural prosperity is significant at 1 per cent level, F value being 6.95 for 1991 and 5.14 for 2001.The results of the regression model may be interpreted as follows.

Availability of cultivable land engages people in agricultural activity which may be high paid and high earning, therefore, higher ratio of GCA to total rural population implies lower share of PRNFW.

On the other hand, commercial crops are produced necessarily for sales in the market and hence with increase in percentage share of NFGA trade and commerce increase to expand PRNFW. Thus GCA is inversely related to PRNFW while NFGA is positively related to PRNFW.

Infrastructural facility

The regression parameter of VELF is statistically significant at 5 percent for both 1991 and 2001. Another infrastructural facility, i.e., road density (RDEN) is positively and significantly related to PRNFW. The regression parameter of RDEN is also statistically significant. The level of significance is 1 percent for both 1991 and 2001. The result of the model may be explained in the following way.

Electricity is productive input for non-farm activity. On the other hand, the block with high road density (RDEN) implies better communication that facilitates the expansion of non-farm activity. It is to note that the infrastructure is a facilitating factor for the expansion of PRNFW of the DP blocks.

Distress factors

Variation in dependency ratio (DR) and the share of marginal farmer households to total households (MFHTH) as distress factors positively and significantly explain the variation in PRNFW / PRNAW across the DP blocks. The regression parameters of DR and MFHTH are significant at 1 per cent level. The results of the model may be explained as follows.

The landless and marginal households in rural areas are most vulnerable and a large concentration of such households in the DP area reflects inadequate agricultural wage employment for all. This results in a spill-over of workers into low productive/low income non-farm activities.

From the block level analysis it is clear that factors relating to agricultural prosperity, rural infrastructure and distress factors are important determinants of PRNFW.

Table 4 Determinants of RNFE/RNAE in DP Blocks of West Bengal, 1991 and 2001

Regression Equation concerning Agricultural Prosperity				
Year	Equation	R^2	Adjusted R^2	F
1991	PRNFW = 29.38- 69.5 GCA** + 1.08 NFGA*** (5.60) (-2.43) (2.76)	.31	.27	6.95***
2001	PRNAW = 43.59 - 82.17 GCA** + 1.29 NFGA*** (6.08) (-1.75) (2.88)	.25	.20	5.14***
Regression Equation concerning Rural Infrastructure				
Year	Equation	R^2	Adjusted R^2	F
1991	PRNFW = 9.87 + 12.67 VELF** + 0.50 RDEN*** (5.00) (2.43) (3.89)	.48	.44	14.07***
2001	PRNAW = 17.79 + 0.08 VELF** + 20.67 RDEN*** (3.45) (2.21) (2.72)	.31	.27	7.10***
Regression Equation concerning Distress Factors				
Year	Equation	R^2	Adjusted R^2	F
1991	PRNFW = - 20.7 + 27.11 MFHTH*** + 52.53 DR*** (-2.83) (4.48) (4.10)	.58	.55	21.40***
2001	PRNAW = -22.67 + 45.92 MFHTH*** + 75.56 DR*** (-1.54) (3.16) (2.90)	.40	.36	10.32***

*** Significant at 5 per cent level and *** 1 per cent level.*
Notes: As in Tables 2 and 3

Table 5 Summary Results from Regression Equation

Independent Variables	1991 PRNFW as Dependent Variable	2001 PRNAW as Dependent Variable
I Agricultural Prosperity i) Gross cropped area (GCA) ii) Non-food grain area to total area (NFGA)	Negative& Significant Positive& Significant	Negative & Significant Positive and Significant
II Infrastructural facilities i) Percentage of Village Electrified (VELF) ii) Road Density (RDEN)	Positive & Significant Positive & Significant	Positive & Significant Positive & Significant
III Distress Factors i) Dependency Ratio (DR) ii) Proportion of Marginal Households to Total Households (MFHTH)	Positive & Significant Positive & Significant	Positive & Significant Positive & Significant

Thus the findings from the regression equations support our hypothesis (in Chapter 1) that rural prosperity and distress variables explained significantly the level of RNFW across DP blocks. The DP area being agriculturally less developed the high dependency ratio results in a tendency for the rural people to engage somehow in rural non-farm activities.

5. A Summing Up
Factors that affect rural non-farm employment (RNFE) / rural non-agricultural employment (RNAE) in the DP blocks of West Bengal are classified into three broad groups, namely agricultural prosperity, infrastructure and distress variables.

Gross cropped area per rural population (GCA) and proportion of non-foodgrains area to gross cropped area (NFGA) represent agricultural prosperity while rural road density (RDEN), percentage of villages electrified (VELF) represent infrastructure, and proportion of marginal farmer households to total households (MFHTH) and proportion of non-workers to total population (DR) indicate distress

variables. GCA is negatively and significantly related to percentage of rural non-farm workers (PRNFW) / percentage of rural non-agricultural workers (PRNAW) while NFGA is directly and significantly related to PRNFW in the DP blocks as well as in sample villages. RDEN and VELF are also related positively and significantly to PRNFW/PRNAW. There is also positive and significant relationship between PRNFW/PRNAW and distress variables. The regression equations concerning PRNFW/PRNAW indicate that variation in PRNFW/PRNAW is explained by agricultural prosperity variables to the extent of 27 per cent in 1991 and 20 per cent in 2001 while variation in infrastructure variables explain the variation in PRNFW/PRNAW to the extent of 44 per cent in 1991 and 27 per cent in 2001. On the other hand, variation in distress variables explains that in PRNFW/PRNAW to the extent of 55 per cent in 1991 and 36 per cent in 2001.The models are significant at 1 per cent level.

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