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Employment, Income and Labour Supply Decision of Rural Households : An Economic Analysis of MGNREGS in Tamil Nadu§

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Abstract

In India, Mahatma Gandhi National Rural Employment Guarantee Scheme (MGMGNREGS) is one of the major rural development programmes. It provides guaranteed employment to the rural households for 100 days in a year. This paper has attempted to find out the employment status, income and labour supply decision of the participants and non-participants of MGNREGS in Tamil Nadu. It has also studied the household nutritional security of these households. The study has revealed that the number of migrants in the family, number of livestock units owned, and number of person-days employed in agriculture, non-agriculture and MGNREGS are significantly influenced by the household income of the participants and non-participants of MGNREGS. The analysis of household food-security has shown that the expenditure for all commodities, viz. leisure, cereals, pulses, oils, fruits & vegetables, milk, chicken and fish are positive and significant in the case of MGNREGS participants, whereas the expenditure variable is significant only for two commodities, viz. cereals and oils in case of MGNREGS non-participants. It shows that the MGNREGS participants consume more high-value commodities like milk, chicken and fish, as compared to MGNREGS non-participants. The labour supply decision of sample respondents has shown that the elasticity of labour supply with respect to wage rate is more than one in both participants and non-participants of MGNREGS, indicating that an one per cent increase in wage rate increases labour supply by 1.92 per cent and 2.36 per cent, respectively. In addition, as the number of dependents increases, the household increases labour supply to derive additional income to meet the increased household expenditures. An interesting and encouraging observation is that the scheme has reduced the migration of people from rural to urban areas.

Key words: MGNREGS, employment, income, labour supply

JEL Classification: J21, J22, H23, I31

Introduction

A number of programmes have been taken up after the Fourth Five-Year Plan for poverty alleviation in India. With the basic objective of development of rural poor, these programmes fall in three broad categories: (i) family livelihood generation (self-employment) programmes, (ii) labour-intensive public works schemes, and (iii) income transfers in terms of kind. The poverty alleviation programmes are used to generate facilities that benefit the poor and raise the productivity of the poor through education, public health and other human resource related measures (Mamoria and Tripathi, 2007). Some of the most important poverty alleviation programmes implemented in India so far are: Integrated Rural Development Programme (IRDP), Employment Assurance Scheme (EAS), Prime Minister's Rozgar Yojana (PMRY), National Social Assistance

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Programme (NSAP), Jawahar Gram Samridhi Yojana (JGSY), Swarnajayanti Gram Swarozgar Yojana (SGRY), Pradhan Mantri Gramodaya Yojana (PMGY), Bharat Nirman, Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), etc. Among these rural development programmes, MGNREGS is the latest having been implemented from 2006. This programme had covered 200 most backward districts in the country during the first year of its implementation. Hundred more districts were added in the second year, and from 2008, it has been covering all the districts of the country. It aims to enhance the livelihood security of the people in rural areas by guaranteeing hundred days of wage employment in a financial year to a rural household whose members volunteer to do unskilled manual work (Chakraborty, 2007).

With this background, the present study was conducted in Tamil Nadu state because it is one of the states where MGNREGS is being implemented successfully, by covering about 19.70 lakh households and disbursing ₹ 744.08 crore during the period of 2006-2008. Another welcome feature of the Scheme witnessed in the state is the overwhelming participation of women, which was nearly 81 per cent, as opposed to Himachal Pradesh which recorded only 12 per cent women participation (Jha *et al.,* 2008). This study was designed to study the performance and participation of rural poor in the MGNREGS by analysing expenditure on food and non-food items, development of human resource capabilities and making of labour supply decisions by rural households. It has also compared the incomes of rural households of participants and non-participants in the MGNREGS. Finally, recommendations to improve the effective implementation of the MGNREGS in Tamil Nadu have been provided and policy implications have been discussed.

Data and Methodology

In the study, primary and secondary data were collected from the participants and non-participants of MGNREGS and various officials in the state, respectively. The data such as list of participants and expenditure on MGNREGS were collected from District Rural Development Agency (DRDA) at district level, Block Development Office (BDO) at block level and *Panchayat* office at village level in Tamil Nadu. Well-structured interview schedules were used to collect the information about consumption expenditure on food and non-food items and labour supply decision of participants and non-participants of MGNREGS and other related information from a total of 360 households, comprising 180 each of participants and non-participants of MGNREGS, respectively in the selected districts, namely Cuddalore, Tiruvarur and Tirunelveli of Tamil Nadu. The districts were selected based on the poverty level of their households and their geographical locations so as to adequately represent the socio-economic diversities of the state and provide an overall picture of consumption expenditure, inequalities in assets and labour supply decisions of rural households. The data collected for the year 2007-2008 were analysed to estimate the following:

- Participation in MGNREGS,
- Household income and its determinants,
- Household food-security, and
- Household labour supply decisions.

Participation in MGNREGS

In this study, an attempt was made to find out the factors which determined the participation status and duration of participation in the MGNREGS by the application of Tobit model. The 'Tobit model' or 'Hybrid Tobit' described by Tobin was of the form of Equation (1):

$$d = X_i$$

$$b + e_i = 0 \qquad \text{if } X_i\, b + e_i > 0 \qquad \ldots(1)$$

where, d was the duration of participation in MGNREGS.

In this analysis, the dependent variable was the duration of participation in MGNREGS and the independent variables were occupation of the household-head, farm size, family size, age and education of the household-head and number of persons migrated from an household to other place. The dependent variable has a normal distribution with mean μ and variance σ^2. For the respondents considered, those values of duration of participation in the MGNREGS that were greater than zero were recorded, and otherwise the value zero was recorded. The Tobit model was specified, where b was the k*1 vector of unknown parameters, x_i was a k*1 vector

normally distributed with mean zero and common variance σ^2. The model was estimated by using the maximum likelihood approach (Jha *et al.,* 2008):

$$Y = a_0 + a_1 OCPH + a_2 FS + a_3 FSIZE + a_4 AGEH + a_5 EDU + a_6 NMIG + U_i \quad \text{..... (2)}$$

where,

Y = Household-head participation in the MGNREGS (number of days),

OCPH = Occupation of household-head (labour, 1, otherwise, 0),

FS = Farm size (No.),

FSIZE = Family size (No.),

AGEH = Age of household-head (number of years),

EDU = Educational status of household-head (number of schooling years),

NMIG = Number of persons migrated to other places,

$a_0, a_1,.....,a_6$ = Regression coefficients, and

Ui = Error-term.

Household Income and its Determinants

Household income determines the standard of living and ensures the growth of assets for sustaining the realized prosperity in the long-run. As income increases, household welfare improves through increase in consumption expenditure which leads to the food and nutritional security of the people. In this context, the following income function was fitted to study the marginal contribution of different factors including employment opportunities and occupations to total household income. The regression model followed in this study was:

$$HHI = a_0 + a_1 EDU + a_2 NMIG + a_3 FZ + a_4 NLU + a_5 NMAGRI + a_6 NMNAGRI + a_7 NMMGNREGS + U_i \quad \text{…(3)}$$

where,

HHI = Total income of the household (₹/year),

EDU = Educational status of household-head (number of schooling years),

NMIG = Number of migrants in the family (persons/household),

FZ = Farm size (ha),

NLU = Livestock units owned (No.),

NMAGRI = Employment in agriculture (person-days/household/year),

NMNAGRI = Employment in non-agriculture (person-days/household/year),

NMMGNREGS = Number of mandays employed in MGNREGS (person-days / household /year),

$a_0, a_1,.....,a_7$ = Regression coefficients, and

Ui = Error-term.

Household Food Security

To estimate the food security at the household level, a flexible and well-suited demand model was preferred. Hence, Almost Ideal Demand System (AIDS) model was chosen for the present study (Deaton and Muellbauer, 1980). It was used to estimate the system of demand functions for leisure, food items like cereals, pulses, milk and vegetables and market purchased commodities. From the estimated leisure demand function, the labour supply elasticities were derived from the equation (Erdogdu, 2008). The linear approximate AIDS model used in the present study was written as:

$$W_i = a_i + \Sigma b_{ij} \ln (P_j) + c_i \ln (E/I) + d_i \ln N_1 + f_i \ln N_2 \quad \text{…(4)}$$

where,

W_i = Average budget share of the i^{th} commodity,

P_j = Price of the j^{th} commodity (₹/kg),

E = Per capita expenditure on nine commodities (₹),

N_1 = Number of workers,

N_2 = Number of dependents, and

i, j = 1,2,…..,9.

The parameters of the model (a_i, b_{ij}, c_i, d_i and f_i) were estimated by imposing the homogeneity (degree zero in prices), symmetry (cross price effects are same across the good), and adding up (all the budget shares add up to one) restrictions. The following restrictions were econometrically imposed:

Homogeneity: $\sum_{j=1}^{n} b_{ij} = 0;$

Symmetry: $b_{ij} = b_{ji}$,

Additivity:

$$\sum a_i = 1, \ \sum b_{ij} = \sum c_i = \sum d_i = \sum f_i = 0$$

The last step in the demand function modelling is the calculation of income and price elasticities to capture the sensitivity and the properties of a demand equation.

The demand elasticities corresponding to the linear version of the AIDS were:

$$e_{ii} = \frac{(b_{ii} - c_i W_i)}{(W_i - 1)}$$

Cross price elasticity

$$e_{ij} = \frac{(b_{ij} - c_i W_j)}{(W_i)}$$

Expenditure elasticity

$$e_{iE} = \frac{c_i}{(W_{i+1})}$$

Elasticity for participants in the MGNREGS

$$e_{iE} = \frac{(d_i - c_i)}{W_i}$$

Elasticity for dependents

$$e_{iE} = \frac{(f_i - c_i)}{W_i}$$

The nature of the demand for food commodities could directly be inferred from the signs of the AIDS parameters. Commodities with negative parameters ($c_i < 0$) were income inelastic, those with positive parameters ($c_i > 0$) were income elastic. Similarly, commodities with positive own price parameters ($b_{ij} > 0$) were price inelastic and those with negative parameters ($b_{ij} < 0$) were price elastic. The price coefficients, (b_{ij}) would imply a change in the i^{th} budget share due to a proportional change in the price keeping the real income at constant (Teklu and Johnson, 1988).

A total of nine commodities were identified in the present study and the total consumption expenditure was the sum of expenditures on all the commodities including the imputed expenditure on leisure. Imputed expenditure on leisure was computed by w.L, where $L = N_1L^* - F_1$. F_1 was the family labour in person-days; L^* was the maximum feasible leisure per worker, and was defined as 365 person-days per year less time spent in household activities; and w was wage rate in rupees. An implicit assumption here was that the leisure time of the dependents had the zero value.

The AIDS model was estimated with Engel aggregation, homogeneity and symmetry restrictions imposed. To ensure that the covariance matrix was non-singular, only eight budget share equations were estimated and the estimates for the left out equation were then derived from the estimated equations using the already imposed restrictions.

Household Labour Supply Decision

One of the important aspects of studying the household behaviour was the household labour supply. Analysis of determinants of supply of labour by the households and the effects of changes in those determinants is crucial in studying the household behaviour. In the present study, the labour supply elasticities were derived by using the estimated leisure share equations of the AIDS model. The total household labour supply function was give by Equation (5):

$$F_1 = N_1L^* - L \qquad \ldots(5)$$

where, F_1 was the labour supplied in person-days; L* was the total time available per worker; L was the leisure; and N_1 was the number of workers.

From the leisure share equation, the demand for leisure can be written as Equation (6):

$$L = E/W\,[a_1 + b_{11} \ln w + b_{12} \ln P_1 + b_{13} \ln P_2 + b_{14} \ln P_3 + b_{15} \ln P_4 + b_{16} \ln P_5 + b_{17} \ln P_6 + b_{18} \ln P_7 + b_{19} \ln P_8 + c_1 \ln (E/P^*) + d_1 \ln N_1 + f_1 \ln N_2] \qquad \ldots(6)$$

where, w is wage rate; P_1, P_2, P_3, P_4, P_5, P_6 P_7, P_8 are prices of PDS and market-purchased commodities.

The labour supply function in Equation (5) can be written in logarithmic form as Equation (7):

$$\ln F_1 = \ln (N_1L^* - L) \qquad \ldots(7)$$

Differentiating Equation (7) with respect to wage, prices of commodities, number of workers and number of dependents, the labour supply elasticities could be worked out. The labour supply elasticities were worked out as follows:

Labour supply elasticity with respect to wage rate:

$$\frac{\partial \ln F_1}{\partial \ln W} = -\left[\frac{b_{11}}{W^*(N_1L^* - L)} + \frac{L}{(N_1L^* - L)}\right]$$

Labour supply elasticity with respect to price of commodities:

$$\frac{\partial \ln F_1}{\partial \ln P_i} = -\left[\frac{b_{1i}}{W^*(N_1L^* - L)}\right]$$

Labour supply elasticity with respect to number of workers:

$$\frac{\partial \ln F_1}{\partial \ln N_i} = -\left[\frac{N_1L^*}{(N_1L^* - L)} - \frac{d_1}{W^*(N_1L^* - L)}\right]$$

Labour supply elasticity with respect to number of dependents:

$$\frac{\partial \ln F_1}{\partial \ln N_2} = -\left[\frac{f_1}{W^*(N_1L^* - L)}\right]$$

where $1/W^* = E/w$. These labour supply elasticities were worked out by using the estimated coefficients of leisure share equation of the AIDS model.

Results and Discussion

Participation in MGNREGS

The participation of rural households in MGNREGS was examined by applying the Tobit model and the estimated results are presented in Table 1.

It could be seen from Table 1 that except family size and age of household-head, all other variables had significantly influenced the participation in the MGNREGS. The signs of the coefficients were as expected with respect to their relationship with participation in the MGNREGS. It is evident from the results that an increase in the educational status of household-head would significantly influence the decision to participate in the MGNREGS, whereas other variables such as occupation of household-head (non-farm employment), family size and number of persons migrated to other places would significantly discourage the participation in the MGNREGS. The results further revealed that one per cent increase in the educational status would increase the participation of household-head in the MGNREGS by 0.70 per cent. On the other hand, one per cent increase in variables like occupation

Table 1. Estimates of the participation in MGNREGS in Tamil Nadu

Variable	Coefficient	Total elasticity
Intercept	35.95	-
	(1.765)	
Occupation of the household-head (OCPH)	-33.40**	-0.87
	(-3.527)	
Farm size (FS), (ha)	-15.40**	-0.08
	(-2.085)	
Family size (FSIZE), (No.)	-2.25	-0.28
	(-0.952)	
Age of household-head (AGEH)	-0.11	-0.14
	(-0.355)	
Educational status of household-head (EDU), (number of schooling years)	7.78**	0.70
	(8.943)	
Number of persons migrated to other places (NMIG)	-31.20**	-0.59
	(-6.758)	
R^2 value	0.52	

Notes: Figures within the parentheses are t- values
** and * indicate significance at one per cent and five per cent levels, respectively.

Table 2. Source-wise income of sample households

(₹/ year)

Source of income	MGNREGS participants	MGNREGS non-participants
Livestock farming	6,673 (27.09)	8,299 (40.29)
Agricultural wages	7,361 (29.88)	7,837 (38.05)
MGNREGS	8,607 (34.94)	0.00 (0.00)
Other sources	1,993 (8.09)	4,461 (21.66)
Total	24,634 (100.00)	20,597 (100.00)

Note: Figures within the parentheses denote percentage to total income

of household-head, farm size and number of persons migrated to other places would decrease the participation in the MGNREGS by 0.87 per cent, 0.08 per cent and 0.59 per cent, respectively. Similar observations were made by Jha *et al.* (2008) who found that marginal and small farmers were participating more in the MGNREGS and it provided supplementary income to them in lean seasons which sustained the livelihood status of these rural households.

Household Income and its Determinants

The details of source-wise income of MGNREGS participant and non-participant households are presented in Table 2. The four income sources of sample households were livestock, agricultural wages, MGNREGS and other sources. The participating households had maximum income from MGNREGS (35%), followed by agricultural wages (30%), livestock farming (27%) and other sources (8%). On the other hand, the non-participating households had maximum income from livestock (40%), followed by agricultural wages (38%) and other sources (22%). Hence, MGNREGS has become a major source of income for the participating households. To find out the factors influencing household income, an income function was fitted and the results obtained are presented in Table 3.

A perusal of Table 3 revealed that about 58 per cent of the variation in total income of the household was explained by the independent variables. The independent variables had the expected relationship with

Table 3. Determinants of household income in Tamil Nadu

Variable	Coefficient
Intercept	10168.10 (7.050)
Educational status of household-head (EDU), (number of schooling years)	63.08 (0.192)
Number of migrants in the household (NMIG), (persons/household)	3579.16* (6.738)
Farm size (FZ), (ha)	1250.01 (0.676)
Number of livestock units owned (NLU)	3225.29* (11.919)
Employment in agriculture (NMAGRI), (person-days/household/year)	41.44* (6.270)
Employment in non-agriculture (NMNAGRI), (person-days/household/year)	50.75* (7.505)
Employment in MGNREGS (NMMGNREGS), (person-days/household/year)	64.58* (11.465)
R^2	0.58

Notes: Figures within the parentheses are t- values
** and * indicate significance at one per cent and five per cent levels, respectively.

the total income of the household. The variables such as number of migrants in the households, number of livestock units owned, number of mandays employed in agriculture, number of mandays employed in non-agriculture and number of mandays employed in MGNREGS turned out to be significant at one per cent level. However, the educational status of household-head and farm size did not influence the total income of a household.

Household Food Security

The analysis of consumption behaviour of the households based on the demand pattern, which in turn relies on income, price and household labour supply characteristics like leisure, number of workers and number of dependents would give more information on food security. Thus, using the household per capita expenditure data, AIDS model was applied to estimate the demand functions for cereals, pulses, oils, fruits and vegetables, milk, chicken, fish, leisure, number of workers and number of dependents for MGNREGS participants and non-participants in the study area.

The estimated parameters of the AIDS model for MGNREGS participants and non-participants are presented in Tables 4 and 5, respectively. It could be

observed from Table 4 that the coefficient expenditure variable was significant and positive for all the commodities, viz. leisure, cereals, pulses, oils, fruits and vegetables, milk, chicken and fish. It implied that the expenditure share on these commodities will increase with increase in real income, prices remaining constant. The nature of demand for commodities could be inferred directly from the sign of AIDS parameters. Commodities with statistically significant parameter values are income elastic. Therefore, all estimated commodities were income elastic and these commodities were normal goods.

The estimated coefficients for household-specific characteristics like number of workers and number of dependents were found statistically significant for all the commodities. The positive coefficient for number of workers indicated that the expenditure share of various commodities increased with increase in the number of workers. It is evident that the own price coefficients of leisure, cereals, pulses, and fruits and vegetables were significant and had the expected negative sign, implying that as price increases, the expenditure share of these commodities would decrease. Commodities with negative cross price coefficients are complements and those with positive coefficients are substitutes. It was seen that leisure had a complementary relation with all the commodities, except oils.

In the case of MGNREGS non-participants, Table 5 reveals that the expenditure variable was significant only for two commodities, viz. cereals and oils, implying that the expenditure share of these commodities would increase with increase in real income, prices remaining constant. The household-specific characteristics like number of workers and number of dependents were found significant for all the commodities, except leisure. The positive influence of number of workers indicated that the expenditure share on consumption of various commodities increased with increase in the number of workers. However, the coefficient of number of dependents was found significantly negative, which indicated that more number of dependents would reduce expenditure share of various commodities due to reduced per capita income. The coefficients of own prices of pulses, oils, milk and fish were found significant and with expected negative sign. This implies that as price increases, the expenditure share on these commodities would decrease.

Own Price, Cross Price and Expenditure Elasticities

Based on the estimated parameters of AIDS model, the own price and cross price elasticities and elasticity with respect to total expenditure (proxy for income), number of workers and number of dependents were calculated and have been presented in Table 6 for both MGNREGS participants and non-participants. For both the groups, the expenditure elasticities for all the commodities (leisure, cereals, pulses, oils, milk, chicken and fish) have been found positive and greater than unity. This implies that as income increased the household was sufficiently responsive to increase its consumption of these commodities. For example, one per cent increase in income led to more than one per cent increase in consumption of all these commodities. The cross price elasticities of rice with most of the other commodities were negative, implying a complementary relationship with each other in the case of MGNREGS participants. The cross price elasticities of most of the commodities were positive and less than unity for the MGNREGS non-participants, which implied that these commodities were substitutes in nature.

Household Labour Supply Decision

An understanding of the relationship between leisure choice and commodity demand is important for various policy issues, such as optimal taxation and the welfare consequences of rationing in labour and food markets. In this context, an attempt was made to identify the determinants of demand and supply of labour and the effects of changes in those determinants which, through the labour market, could have an impact on income distribution. The wage rate is an important factor to determine the labour supply. The estimated results of the labour supply have been presented in Table 7.

The labour supply elasticities presented in Table 7 were derived based on the estimates of leisure share equation of AIDS model. It is evident from Table 7 that the labour supply was highly inelastic with respect to the prices of all commodities as well as to the number of dependents. Labour supply by rural households was found to be more elastic with respect to the prices of beverages, implying that the rural households supply more labour for an increase in price of beverages as additional incomes are quite often used for the consumption of tea, cool drinks and alcoholic beverages.

Table 4. Parameter estimates of AIDS model (with restrictions) for MGNREGS participants in Tamil Nadu

Particulars	Price of									Expenditure	Number of workers	Number of dependents
	Constant	Leisure	Cereals	Pulses	Oils	Fruits and vegetables	Milk	Chicken	Fish			
Leisure	-2.2391***	-0.8746*	-0.1010***	-0.1189***	-0.0196	-0.2039***	-0.3372***	-0.1609	-0.0521***	0.3355***	0.1714***	-0.1094***
	(-6.572)	(-1.501)	(-4.576)	(-6.280)	(-0.552)	(-7.134)	(-3.919)	(-0.278)	(-2.917)	(5.243)	(5.959)	(-4.645)
Cereals	-1.4328***	-0.1010***	-0.0528***	0.0087**	-0.0179***	0.0494***	-0.0403***	0.0149***	-0.0026	0.3231***	0.1718***	0.1766***
	(-5.504)	(-4.576)	(-3.021)	(2.443)	(-3.282)	(9.472)	(-4.427)	(4.605)	(-0.484)	(6.192)	(5.005)	(8.932)
Pulses	-0.6399***	-0.1189***	0.0087**	-0.0074*	0.0181***	-0.0121***	0.0627***	-0.0051*	0.0010	0.1683***	0.0784***	0.0817***
	(-5.015)	(-6.280)	(2.443)	(-1.415)	(3.620)	(-3.145)	(5.246)	(-1.558)	(0.304)	(6.791)	(5.012)	(9.105)
Oils	-1.7456***	-0.0196	-0.0179***	0.0181***	-0.0129	-0.0074	-0.0536**	-0.0316***	-0.0230***	0.3544***	0.1372***	0.1801***
	(-6.891)	(-0.552)	(-3.282)	(3.620)	(-0.935)	(-0.984)	(-2.188)	(-4.930)	(-2.808)	(7.342)	(4.383)	(9.173)
Fruits and vegetables	0.2912***	-0.2039***	0.0494***	-0.0121***	-0.0074	-0.0488***	0.0655***	0.0189***	0.0458***	0.0247*	0.0965***	0.0188***
	(4.077)	(-7.134)	(9.472)	(-3.145)	(-0.984)	(-6.242)	(3.056)	(3.707)	(8.603)	(1.999)	(11.194)	(3.404)
Milk	-2.0232***	-0.3372***	-0.0403***	0.0627***	-0.0536**	0.0655***	0.0591	0.1687***	-0.0770***	0.4622***	0.1587***	0.2414***
	(-5.635)	(-3.919)	(-4.427)	(5.246)	(-2.188)	(3.056)	(0.622)	(10.942)	(-5.589)	(7.689)	(3.973)	(10.042)
Chicken	-0.2524**	-0.1609	0.0149***	-0.0051*	-0.0316***	0.0189***	0.1687***	-0.0356	0.0100***	0.1260***	0.0663***	0.0539***
	(-2.989)	(-0.278)	(4.605)	(-1.558)	(-4.930)	(3.707)	(10.942)	(-0.614)	(2.819)	(7.362)	(6.157)	(8.517)
Fish	-2.0087***	-0.0521***	-0.0026	0.0010	-0.0230***	0.0458***	-0.0770***	0.0100***	-0.0074	0.4036***	0.0138***	0.2069***
	(-6.995)	(-2.917)	(-0.484)	(0.304)	(-2.808)	(8.603)	(-5.589)	(2.819)	(-1.164)	(7.030)	(3.676)	(9.252)

Notes: Figures within the parentheses are t- values

***, ** and * indicate significance at one per cent, five per cent and ten per cent levels, respectively.

Table 5. Parameter estimates of AIDS model (with restrictions) for MGNREGS non-participants in Tamil Nadu

Particulars	Price of									Expenditure	Number of workers	Number of dependents
	Constant	Leisure	Cereals	Pulses	Oils	Fruits and vegetables	Milk	Chicken	Fish			
Leisure	0.3480	-0.4738	-0.0522*	-0.0101	-0.0394	-0.1965***	-0.0598	-0.1999	-0.0025	0.0141	0.0199	0.0153
	(1.164)	(-0.815)	(-1.857)	(-0.602)	(-0.800)	(-4.964)	(-0.617)	(-0.350)	(-0.086)	(0.266)	(0.488)	(0.538)
Cereals	-1.1298***	-0.0522*	-0.0148	0.0111*	0.0094*	-0.0014	0.0174	0.0019	0.0217***	0.1366*	0.2696***	-0.0413*
	(-3.497)	(-1.857)	(-0.993)	(1.856)	(1.512)	(-0.156)	(1.379)	(0.388)	(3.678)	(2.022)	(9.019)	(-1.541)
Pulses	-0.4583***	-0.0101	0.0111*	-0.0411***	0.0061	0.0028	0.0051	-.0088*	0.0295***	0.0403	0.1911***	-0.0412***
	(-3.274)	(-0.602)	(1.856)	(-5.567)	(0.816)	(0.274)	(0.355)	(-1.526)	(3.284)	(1.308)	(9.028)	(-2.885)
Oils	-0.4952*	-0.0394	0.0094*	0.0061	-0.0355**	0.0527***	0.0150	-0.0990**	0.0243***	0.0698*	0.2254***	-0.0511*
	(-1.716)	(-0.800)	(1.512)	(0.816)	(-2.161)	(3.873)	(0.496)	(-7.406)	(2.679)	(1.182)	(8.809)	(-1.525)
Fruits & vegetables	0.2044*	-0.1965***	-0.0014	0.0028	0.0527***	0.0194	0.0377*	0.0524***	0.0101	0.0102	0.0630***	-0.0368***
	(1.525)	(-4.964)	(-0.156)	(0.274)	(3.873)	(1.029)	(1.688)	(5.351)	(0.992)	(0.373)	(4.653)	(-3.792)
Milk	-0.9561***	-0.0598	0.0174	0.0051	0.0150	0.0377*	-0.1305*	0.0401*	0.0137	0.1053	0.3811***	-0.0777**
	(-2.858)	(-0.617)	(1.379)	(0.355)	(0.496)	(1.688)	(-1.525)	(1.784)	(0.558)	(1.443)	(8.770)	(-2.503)
Chicken	-0.1979	-0.1999	0.0019	-0.0088*	-0.0990***	0.0524***	0.0401*	0.2139	0.0288***	0.0260	0.0803***	-0.0162*
	(-1.116)	(-0.350)	(0.388)	(-1.526)	(-7.406)	(5.351)	(1.784)	(0.372)	(3.438)	(0.981)	(6.991)	(-1.816)
Fish	-0.9024***	-0.0025	0.0217***	0.0295***	0.0243***	0.0101	0.0137	0.0288***	-0.0334**	0.0881	0.3385***	-0.0655**
	(-3.021)	(-0.086)	(3.678)	(3.284)	(2.679)	(0.992)	(0.558)	(3.438)	(-2.518)	(1.382)	(9.060)	(-2.518)

Notes: Figures within the parentheses are t- values

***, ** and * indicate significance at one per cent, five per cent and ten per cent levels, respectively.

Table 6. Matrix of elasticities based on AIDS model for MGNREGS participants and non-participants in Tamil Nadu

Particulars	Price of									Expenditure	Number of workers	Number of dependents
	Leisure	Cereals	Pulses	Oils	Fruits and vegetables	Milk	Chicken	Fish	Beverages			
MGNREGS participants												
Leisure	-0.1976	-0.1576	-0.1602	-0.0139	-0.2861	-0.4569	-0.2124	-0.0727	-2.9663	1.4365	0.2134	-0.2941
Cereals	-5.8156	-0.4441	0.0774	-0.4411	0.5667	-0.8962	0.2108	-0.1041	-1.3225	2.3783	8.2381	2.4380
Pulses	-19.884	-0.1144	-0.5756	1.0874	-1.6113	4.4501	-0.5017	-0.0695	-3.1696	1.4477	1.9755	6.9383
Oils	-9.5180	-1.4759	0.5129	-1.8394	-0.9114	-2.5770	-1.2840	-1.0147	-3.2450	1.4342	1.8506	6.5588
Fruits and vegetables	-4.6919	1.0083	-0.2617	-0.1689	0.0167	1.3565	0.3940	0.3918	-3.4891	1.5189	2.5498	0.1230
Milk	-16.478	-1.6188	1.3535	-1.5667	1.0358	-0.0556	3.9381	-1.9552	-2.7346	1.1999	1.4777	5.2556
Chicken	-37.009	1.0541	-0.9564	-5.0227	1.8530	2.4095	-6.2299	1.2393	-4.0067	1.9091	2.7606	1.0356
Fish	-32.372	-2.4011	-0.3595	-3.0115	-0.0250	-7.1296	0.4937	-2.0682	-8.3928	3.7055	4.8412	1.7572
MGNREGS non-participants												
Leisure	-0.4050	-0.0662	-0.0127	-0.0503	-0.2535	-0.0775	-0.2572	-0.0035	-1.8858	1.0182	0.0438	0.0015
Cereals	-1.0259	-1.4178	0.1730	0.1162	-0.1621	0.2245	0.0217	0.3846	-5.2806	3.5946	7.7170	-3.3798
Pulses	-1.4545	0.6153	-1.7784	0.3492	0.0469	0.2333	-0.6233	1.9933	-0.8237	3.7624	15.863	-5.5882
Oils	-0.6244	0.2394	0.2119	-0.4247	2.0665	0.5119	-4.1868	0.9929	-4.3015	3.9375	12.430	-5.0912
Fruits and vegetables	-3.9068	-0.0368	0.0505	1.0033	-0.6398	0.7120	1.0014	1.0004	-2.0100	1.1943	1.3982	-0.8980
Milk	-3.4588	0.2897	0.0859	0.3055	0.7851	-2.0572	0.9658	0.3058	-2.2348	3.5710	1.1876	-4.4686
Chicken	-3.9694	0.0958	-1.6670	-17.970	9.2110	7.2118	3.7365	5.1388	-5.9875	3.6794	1.9157	-7.5953
Fish	-6.4863	1.5616	2.5771	2.0317	4.3675	1.2043	2.5400	1.9659	0.7223	4.0396	3.8952	-14.020

Table 7. Estimates of derived labour supply elasticities for MGNREGS participants and non-participants in Tamil Nadu

Particulars	MGNREGS participants	MGNREGS non-participants
Wage rate	1.9246	2.3631
Price of cereals	0.0236	0.0195
Price of pulses	0.0278	0.0038
Price of oils	0.0045	0.0147
Price of fruits & vegetables	0.0476	0.0735
Price of milk	0.0788	0.0223
Price of chicken	0.0376	0.0748
Price of fish	0.0122	0.0009
Price of beverages	0.4276	0.3870
Number of workers	1.090	1.530
Number of dependents	0.0255	0.0057

The elasticity of labour supply with respect to wage rate was more than one in both MGNREGS participants and non-participants, indicating that one per cent increase in wage rate would increase labour supply by 1.92 per cent in MGNREGS participants and 2.36 per cent in MGNREGS non-participants. Elasticity of labour supply with respect to number of workers was about one in the case of MGNREGS participants and it was more than one (elastic) for MGNREGS non-participants. Likewise, as number of dependents increased, the household increased the labour supply to derive additional income to meet the increased household expenditures. Thus, the study concluded that wage rate and number of workers in household were the significant determinants of labour supply.

Conclusions

The study has revealed that participation in the MGNREGS increases with increase in the educational level and decreases with occupation of household-head (non-farm employment) and farm size. An interesting and encouraging observation is that the scheme has reduced the migration of people from rural to urban areas. The study has shown that agricultural labourers, and marginal and small farmers rely on the MGNREGS to supplement their income in the off-season. The household income of the MGNREGS participants was influenced by the number of migrants in the household, number of livestock units owned, number of person-days employed in agriculture, non-agriculture and MGNREGS. However, the educational status of household-head and farm size have not been the determinants of total income of the households. The analysis of household food security has shown that the expenditure for all commodities, viz. leisure, cereals, pulses, oils, fruits & vegetables, milk, chicken and fish is positive and significant in the case of MGNREGS participants, whereas the expenditure variable is significant only for two commodities, viz. cereals and oils, in the case of MGNREGS non-participants. The study has shown that the MGNREGS participants consume more high-value commodities like milk, chicken and fish as compared to MGNREGS non-participants.

The household-specific characteristics like number of workers and number of dependents have been found to be statistically significant for all the commodities, viz. leisure, cereals, pulses, oils, milk, chicken and fish in the case of MGNREGS participants. Similarly, in the case of MGNREGS non-participants, the number of workers and number of dependents have been found to be significant for all the commodities except leisure. The positive influence of the number of workers has indicated that the expenditure share on consumption of various commodities increased with increase in number of workers. For both the groups, the expenditure elasticities for all the commodities were positive and greater than unity. This implies that as income increases the household is sufficiently responsive to increase its consumption of these commodities.

The study has shown that the elasticity of labour supply with respect to number of workers was about one in the case of MGNREGS participants and it is greater than one for MGNREGS non-participants. Likewise, as number of dependents increases, the household increases labour supply to derive additional income to meet increased household expenditures. Hence, this analysis has concluded that wage rate and number of workers in a family are significant determinants of labour supply by rural households. Finally, the study has suggested that the government should implement MGNREGS effectively for the benefit of small and marginal farmers and agricultural labourers, particularly in the lean season, as it would help to reduce labour scarcity for agricultural operations during crop season and would ensure income to the beneficiaries throughout the year. Besides, the government should encourage more people to participate in the scheme through effective targeting of the rural people and proper monitoring of the MGNREGS.

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