

# Doubling of Small and Marginal Farmers Income through Rural Non-Farm and Farm Sector in Karnataka

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## ABSTRACT

The paper has examined the importance of rural non-farm and farm sector in meeting the consumption expenditure and the nutritional security of the small and marginal farmers. The study has analyzed the factors affecting the income of the diversification. The role of small farms is well recognized in the contribution towards total food grain production and poverty reduction. The study revealed that the contribution of marginal and small farmers to the total output is higher when compared to their share in the total land holdings. The contribution of small and marginal farmers to output ranges from 19 per cent in Punjab to 86 per cent in West Bengal and it indicates the significant regional variations in their contribution to output. The farm level study conducted in Raichur district of Karnataka clearly indicates that income from the horizontal diversification is unable to meet the monthly expenditure of the household. The medium farmers and the income from crop enterprise are enough to meet the monthly household consumption expenditure. All the categories of the farmers were nutritionally better off and were consuming more than the recommended level with regard to milk, vegetables and fruits through diversified farming. Further, the availability of irrigation, farm mechanization, farm size and the experience of the farmers have been identified as the important factors influencing the diversified farming income. Thus, this study suggested that giving importance to both farm and non-farm sector will be the best option to double the income of the farmers particularly small and marginal farmers.

**Keywords:** Diversification, small, marginal, double income, irrigation, farm mechanisation

In India small and marginal holding farmers cultivate around 44 per cent of the area, and they produce around 60 per cent of the total food grain production (49% of rice, 40% of wheat, 29% of coarse cereals and 27% of pulses) and over half of the country's fruits and vegetables production (Agricultural census, 2014). Further, small and marginal farmers are generally more efficient than the large farmers in terms of per hectare output and cropping intensity (Chand *et al.* 2011). Yet they are generally much poorer than the rest of the population, even though they are insecure with respect to food and nutrition when compared to the urban folks.

In India, small and marginal farmers average size of holdings is about 0.38 ha when compared to 17.37 ha for large farmers, which cannot generate adequate

employment and income from crop cultivation (Dev, 2017). Most of the small and marginal farmers produce specialized crops and it is usually more prone to risk due to uncertain weather condition and the fluctuation in the domestic and international prices. No doubt, the specialization in a particular type of crop may enhance farmers' managerial skills. However, specialized farming may lose some of the benefits such as multi-dimensional use of limited land, synergistic production system, use of products of one enterprise as inputs to another enterprise on the same farm level. Furthermore, majority of the small and marginal farmers have limited access to technology, inputs, credit, capital and markets and the absence of adequate farm and non-farm employment opportunities which lead them to perpetuate in poverty trap.

The UN Inter-Governmental Panel on Climate Changes fifth assessment report has concluded that climate change has and will continue to affect the agricultural sector significantly. Climate change is a major challenge for food security and for the rural people who depend on agriculture for their livelihood. The adverse impact will be more pronounced on small holding farmers those who are living in fragile climatic conditions, and who face an immediate and frequent crop failure, loss of livestock etc. In turn, it would have adverse effects on the livelihood of small farmers in particular which makes them to migrate to cities to explore alternative ways of livelihood.

### The rationale of diversification

In order to achieve the sustainable development goals to halve hunger and poverty in India by 2030 and to double the farms income of the small and marginal by 2022, the policy makers have to focus more on diversification (vertical and horizontal). It can be one of the best options to enhance the farm income, which lead to food, nutrition and ecological security. The term diversification means to move or extend in the different direction from the point (Jha *et al.* 2009).

With respect to agriculture, diversification refers to re-allocation of some of the farm resources such as land, capital, farm equipment and family labour to new activities; it can be high value crops, livestock, value addition at farm level, and non-farm activities such as restaurant and shops. Diversification helps to reduce the risk, for meeting the consumers taste and preference, for buffering to external shock, and for responding to climate change. The process of diversification can be classified as horizontal and vertical diversification.

In India, around 84 per cent of the farmers belong to small and marginal farmers who contribute more than 60 per cent of the total food production in spite of the fact that their income from crop cultivation is not sufficient to meet their monthly expenditure of the household. (Dev, M. 2017). Thus, both vertical and horizontal diversification is the need of the hour. With this background, the present study aims to identify the percentage distribution of small and marginal farmers in India and their contribution towards agricultural sector. Secondly, the average monthly income of farmers from different sources

and their monthly consumption expenditure. Finally, the farm level study is discussed to highlight the importance of diversification in stabilizing income and improving the nutritional status of the farmers.

### Role and challenges of smallholders

In this section, we examine the structure of land holding and the contribution of small and marginal farmers to agricultural sector in India from the cultivation of crops.

### Structure of land holdings

India is a land of small farmers. According to the agricultural census, marginal and small farmers had accounted for around 85 percent of the operational holding in 2010-11 as indicated in the Table 1. Similarly, the area operated by the marginal farmers was around 51 percent in 1970-71, which has been increased to 67 percent in 2010. This fact indicates that the small holding farmers in Indian agriculture are much more prominent today than before.

**Table 1:** Percentage change in number of land holdings

Size groups	Number of holdings (in '000)			
	1970-71	% share	2010-11	% share
Marginal	36200	51	92826	67
Small	13432	19	24779	18
Semi-medium	10681	15	13896	10
Medium	7932	11	5875	4
Large	2766	4	973	0.8
All sizes	71011	100	138348	100

Source: Agriculture Census, 2010-11

The contribution of the marginal and small farmers to the total output is higher when compared to their share in the area. The share of these farmers was 36.51 per cent in land possessed but they contributed 51.2 per cent to the total output of the country (Table 2) at all India level in 2002-03. There is significant regional variations in their contribution to output. The share of output is less than the operated area in the seven states (Table 2).

In rest of the states, it depicts contrasting results. The contribution of small and marginal farmers to output ranges from 19 per cent in Punjab to 86 per

**Table 2:** The comparison of small and marginal farmers' share in area and output (%)

Sl. No.	States	2002-2003		2010-2011	
		Share in area (Land possessed)	Share in output	Share in area (Land possessed)	Share in output
1	Andhra Pradesh	47.5	46.7	54.9	53.98
2	Bihar	67.2	69.2	76	78.26
3	Chhattisgarh	49.4	46.1	54.45	50.81
4	Gujarat	34.3	35.3	36.86	37.93
5	Haryana	42.2	29.9	54.23	38.42
6	Jammu & Kashmir	66.4	77.3	72.7	84.63
7	Jharkhand	73.1	78.1	75.42	80.58
8	Karnataka	37.4	38.5	40.05	41.23
9	Kerala	79.8	78.1	81.23	79.5
10	Madhya Pradesh	34.3	27.9	38.41	31.24
11	Maharashtra	31.7	35.2	45.15	50.14
12	Odisha	73.2	72.5	76.23	75.5
13	Punjab	29.9	19.3	35.45	22.88
14	Rajasthan	22.6	33.2	25.63	37.65
15	Tamil Nadu	54.4	51.7	60.65	57.64
16	Uttar Pradesh	59.4	65.1	64.77	70.99
17	West Bengal	83	86.2	87.52	90.89
	All India	36.51	51.2	44.31	57.78

Source: Ministry of Agriculture, Agriculture census at a glance, 2014.

cent in West Bengal.

Large farmers are cultivating many crops and they prefer high value crops which involves high cost and modern input. Whereas, the small farmers concentrate on one or a few crops, preferring the traditional low risk crops for survival (Table 3). Non-traditional or high value perishable crops are having higher production costs, and hence there is a greater risk from crop failure. The prices of high value crops are more volatile due to thin markets (markets with low volumes of trade and fewer transactions), relatively uncertain yields, and perishability.

#### Average monthly income and consumption

The total income of agricultural household varies by the land holdings possessed by them (Table 4). In 2013, the average monthly income from one hectare of land was lower than their monthly consumption expenditure. It is also important to note that the share of average monthly income from different sources vary by the extent of land possessed by the household.

#### Farm level diversification of crop and non-farm activities in Karnataka

Desirable change is needed to bring stability in the farmer's income level, particularly in small and marginal farmers and the paradigm shift in the existing system towards a more balanced cropping or farming system to meet the ever-increasing demand for food, feed, fiber, fuel and fertilizer with sustainable agro-ecosystem. Diversification is considered as a better alternative to enhance income. Further, the farming system approach is highly location specific involving appropriate combination of complimentary farm enterprises *viz.*, cropping systems, livestock, fisheries, forests and poultry by utilizing the available resources of farmers and by involving in the non-farm activities to raise their income and the nutritional status of the farmers.

The present study was carried out in Raichur district of Karnataka, since this district is known for growing diversified crops. In this district, the area under cereals accounts 49.58 per cent of the cultivated area, while pulses are accounted 22.27 per cent and oilseeds are accounted for 17.93 per cent.

**Table 3:** Percent area under major crops by different farm categories in India

Crop	Marginal	Small	Semi-medium	Medium	Large	All
Cereals	69.54	61.52	55.76	57.45	53.21	59.5
Pulses	7.23	10.37	12.54	11.41	13.57	11.02
Sugar	3.03	3.13	3.23	3.27	3.67	3.27
Spices	1.23	1.33	2.23	2.21	5.65	2.53
Fruits	1.34	1.03	1.27	1.32	2.43	1.48
Vegetables	3.37	2.27	1.32	2.13	1	2.02
Oilseeds	9.54	12.56	16.27	14.59	14.11	13.41
Fibers	4.72	7.79	7.38	7.62	6.36	6.77

Source: Ministry of Agriculture, Agriculture census at a glance, 2014

**Table 4:** Average monthly income (₹) from different sources, monthly consumption expenditure per agricultural household in 2013 for each size-class of land possessed

Size class of land possessed	Income from wages (A)	Net income from cultivation (B)	Net income from farming of animals (C)	Net Income from Non -farm income (D)	Total income (A+B+C+D)	Consumption
<0.01	3079	31	1223	469	4742	5139
0.01-0.40	2557	712	645	482	4396	5402
0.41-1.00	2072	2177	645	477	5371	5979
1.01-2.00	1744	4237	825	599	7405	6430
2.01-4.00	1681	7433	1180	556	10849	7798
4.01-10.00	2067	15547	1501	880	19995	10115
>10.00	1311	35713	2616	1771	41412	14445
All classes	2146	3713	784	528	6653	6229

Source: Chandrasekhar & Mehrota, 2016

The district is known for producing horticultural crops like brinjal, chilli, cucumber, gourds, and leafy vegetables along with fruits crops like mango, sweet lime, sapota etc. Thus, this district was selected purposively for the study. A purposive sampling procedure has been adopted for the study during 2016-2017 with 100 respondents who are practicing diversified farming.

### Model Selection

In this part, the main objective is to find the main influencing factors on the gross income of the farmers through diversification and it involves other factors which makes it suitable to analyze from the multiple linear regression models. The specific model is as follows:

$$\log Y = \log \alpha + \beta_1 \log X_1 + \beta_2 \log X_2 + \beta_3 \log X_3 + \beta_4 \log X_4 + \beta_5 \log X_5 + \beta_6 \log X_6 + \varepsilon$$

Y is the gross income of the farmer through

diversification,  $\alpha$  is the constant term,  $\beta_n$  is the regression coefficient of the corresponding variable,  $X_1$  (Age of the farmer in years),  $X_2$  (Education of the farmer),  $X_3$  (Experience of farmer in years),  $X_4$  (Availability of irrigation),  $X_5$  (farm mechanization),  $X_6$  (farm size),  $\varepsilon$  is the random disturbance term.

### Findings of the study

The results of the study revealed that majority of the marginal farmers generate their income from non-farm sectors which accounts for 41 percent followed by livestock (34%) and wages (25%) whereas small farmers mainly generate their income from the cultivation of crops (52%) followed by non-farm activities (18%). The medium farmers derive their income from the cultivation of crops (81) followed by livestock (8%) to their total income.

The findings reveal that the net income from crop enterprise and horizontal diversification contributes around 12 and 59 percent to the monthly

## The description of the explanatory variables fitted in the model

Particulars	Descriptions of variables	Outcome of the results
Age of the farmer (in years)	30-40 = 30, 40-50 = 55, 50-60 = 15.	Positive or negative
Education of respondent	literate = 1, illiterate = 0	Positive
Experience of the farmer (in years)	10-15 =30, 15-20 = 46, 20-25 = 24	Positive
Availability of irrigation	All season =1, rainfed = 0	Positive
Farm Mechanization	Owned Tractor = 1, otherwise = 0	Positive
Farm size (in ha)	< 1 = 15, 1-2 = 29, 2-4 = 30 and > 4 = 26	Positive

**Table 5:** Average monthly income from different sources of the household in the study area (₹/month)

Categories	Income from wages (A)	Income from cultivation (B)	Income from livestock (C)	Income from Non-farm sectors (D)	Total income (A+B+C+D)
Marginal	2174 (25)	1082 (12)	2920 (34)	3500 (41)	9676
Small	1875 (13)	7295 (52)	2256 (16)	2585 (18)	14,011
Medium	1087 (5)	21990 (81)	2654 (8)	1582 (6)	27313

The figures in brackets indicate the percentage to the total income.

**Table 6:** The Monthly average net income from crop enterprise, horizontal diversification and vertical diversification in study area (₹/month)

Categories	Income crop Enterprise	Income from Horizontal Diversification (HD)	Income from Vertical Diversification (VD)	Income from Total Diversification (HD+VD)	Monthly consumption Expenditure (₹/month)
Marginal	1082 (12)	6176 ( 72)	3500 (41)	9676	8547
Small	7295 (59)	11426 (93)	2585(21)	21,306	12250
Medium	21990 (151 )	25731 ( 177)	1582(11)	27313	14500

The figures in the brackets indicate the percentage to the monthly consumption expenditure of the household; HD: Horizontal diversification (crop + Livestock+ Farm wages); VD: Vertical diversification (Non-Farm activities).

consumption expenditure of marginal and small farmers respectively. Whereas the net income from horizontal diversification contributed 72 per cent monthly consumption expenditure for marginal farmers whereas for small farmers it was 93 percent as indicated in the Table 6. In case of medium farmers, single crop enterprise is enough to meet the monthly household consumption expenditure. Thus, the results clearly indicate that income from the wages, crop enterprises are inadequate to meet the monthly consumption expenditure of the household for both marginal and small farmers as indicated in the table, and they have to borrow to meet the rest of the expenditure. Therefore, promotion of rural non-farm sector is essentially for generating incomes of the rural population.

### Nutritional status of the households

Agricultural diversification provides alternative strategies for the rural households to improve their diet (Hendrick and Msaki, 2009; Khandker and Mahmud, 2012) and the diversified crops yield diverse food items for personal consumption which in turn improves their nutritional status. The growing of different groups of food crops contribute directly to a more diversified nutritional intake, at the same time commercialization in agriculture enhances the income that enable households to access goods and services which is essential for sustaining their nutrition (Alderman *et al.* 2006).

The Table 7 indicates that the through-diversified farming quantity of milk, vegetables and fruits

**Table 7:** Nutritional improvement of the households by diversified farming (Kg/month)

Food composition	Marginal		Small		Medium	
	Rec	DS	Rec	DS	Rec	DS
Cereals and Millets (Kgs)	36	25 (70)	60	71(118)	48	77(160)
oilseeds (Kgs)	7	0.64 (9)	12	0.1(0.83)	10	0.8(8)
Pulses (Kgs)	3	3 (100)	4.5	3(67)	4	3(75)
Milk (liters)	27	30 (111)	45	50(111)	36	52(144)
Vegetables (Kgs)	18	22 (122)	30	34(113)	24	30(125)
Fruits (Kgs)	9	18 (200)	15	26( 173)	12	28( 233)

*Rec:* Recommended amount of food per month per household, (five member/household); *DS:* Diversified system; Figures in the bracket indicate respective percentage of food item to recommend.

**Table 8:** The factors influencing the diversified farm income of the farmer in the study area

Variables	Coefficient	SE	t value	LOS
Intercept	0.125	0.859	0.14	0.89
AGE	0.089	0.128	0.69	0.09
EDU	0.081	0.564	0.14	0.46
EXP	0.458*	0.058	7.84	0.01
IRR	0.256*	0.089	2.86	0.01
FRM	0.46**	0.097	4.71	0.02
FMS	0.89*	0.128	6.95	0.00
R square	0.789	F - ratio : 39.56		

*Note:* \* and \*\* indicates the significant at 1 percent and 5 percent level of significance

were supplied more than the recommended amount of food per household to all the categories of the farmers. In case of cereals and millets, they were supplied above the recommended amount of food per month per household for small and medium farmers.

### Factors influencing the diversified farm income

The Table 8 results obtained from the regression indicate that 78 percentage of the explanatory variables used in the model are collectively explaining variation in the gross income through agricultural diversification. Thus, the overall model is significant and a good fit. It also indicates that the experience of farmers in farming, the availability of irrigation and farm size exhibits a positive sign, an indication that for every unit increase of any of the variables, it leads to an increase in the gross income through diversification by the corresponding estimate.

If one-year experience of the farmer increases, it results into an increase in 0.458 percent income from diversification.

The one percentage increase in the area under irrigation leads to an increase of 0.256 percent in the gross income of the farmer. It is evident from the previous studies that greater access to irrigation facilities improve income and livelihood significantly. Irrigation is frequently cited as an innovation that can improve rural livelihoods, food security, and poverty reduction (Lipton, 2003; Polak and Yoder, 2006).

The Farm mechanization was positive and significant at 5% in determining the gross income of the farmer. This is because farm mechanization will help to reduce the drudgery of the human beings and draught animals, and will enhance the cropping intensity, precision and timelines of the efficiency of utilization of various crop inputs and reduce the loss at different stages of crop production. The end objective of farm mechanization is to enhance the income of the farmer and production with the lowest cost of production. Thus, Farm mechanization and accelerating provision of irrigation infrastructure are the two major interventions proposed among the others for modernizing agriculture.

The farm size positively influences the income from the diversified farming. It shows that if one percent increases in the farm area leads to increase in the 0.89 percent of income from diversified farming.

## CONCLUSION

The present study has been taken up in the Raichur district of Karnataka with a sample of 100 farmers. The study clearly shows that the income from the crop enterprise was not able to meet the monthly consumption expenditure of the farmers, particularly small and marginal farmers. It also observed that income from crop enterprise was able to meet the consumption expenditure for medium farmers.

All the categories of the farmer are nutritionally better off due to diversified farming. It was observed that the consumption of milk, vegetables and fruits were above the recommended level. Further, the regression analysis results indicated that the education of the respondent, experience of the farmer; farm mechanization and farm size were found as the important factors influencing income from diversified farming. Thus, the study suggested that giving importance to both farm and non-farm sector will be the best option to double the income of the farmers, particularly small and marginal farmers.

## REFERENCES

Alderman, H., Hoogeveen, H., and Rossi, M. 2006. Reducing child malnutrition in Tanzania: Combined effects of income growth and program interventions. *Economics & Human Biology*, 4(1): 1-23.

- Anonymous. All India report on number and area of operational holdings. Agriculture Census New Delhi: Ministry of Agriculture: 2010-11.
- Brajesh, J., Nites, K. and Biswajit, M. 2009. Pattern of Agricultural Diversification in India. Working Paper Series No.E/302/2009. New Delhi: Institute of Economic Growth University of Delhi Enclave North Campus Delhi.
- Chand, R., Prasanna, L.P. and Singh, A. 2011. Farm Size and Productivity: Understanding the Strengths of Smallholders and Improving Their Livelihoods. *Econ. Polit. Week*, pp. 5-11.
- Chandrasekhar and Nirupam, M. 2016. Doubling farm incomes by 2022, What it would take? *Econ. Polit. Week*, pp. 51-58.
- Dev, M. 2017. Small Farmers in India: Challenges and Opportunities. Retrieved March 2017, from IGIDR Working Paper: <http://www.igidr.ac.in/pdf/publication/WP-2012-014.pdf>
- Hendrick, S.L. and Msaki, M.M. 2009. The impact of smallholder commercialization of organic crops on food consumption patterns, dietary diversity and consumption elasticities. *Agrekon.*, pp. 48-52.
- Khandker, S.R. and Mahmud, W. 2012. Seasonal Hunger and Public Policies. Washington DC: Book. World Bank.
- Lipton, M. 2003. Can Small Farmers Survive, Prosper, or be the Key Channel to Cut Mass Poverty? *J. Agric. Dev. Econ.*, 13: 58-85.
- Lipton, M., Litchfield, J. and Faures, J.M. 2003. The effects of irrigation on poverty: A framework for analysis. *Water Policy*, 5: 413-27.
- Polak, P. and Yoder, R. 2006. Creating wealth from groundwater for dollar-a-day farmers: Where the silent revolution and the four revolutions to end rural poverty meet. *Hydrogeology Journal*, 14(3): 424-432.

