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## Pluri-activity of farm households as livelihood strategy: A study in Southern Karnataka

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### Abstract

India has a large agrarian economy with most of its rural population being marginal and small subsisting on farming. The standard of living of these farm households is measured by annual income, consumer expenditure, investment on productive assets and their indebtedness. Of all, income plays a major role in determining the household expenditure, savings and investment of farm households. Income includes farm, off-farm and non-farm. When income rises steadily consumption also rises but, for the same reason, when income decline, consumption also falls sharply, with devastating consequences for farm households. Thus, the current study was taken up to study the sources of farm household income and factors influencing income sources considering 120 sample farmers. Mandya district where surface irrigation is predominant (Surface Water Users) and Tumakuru where the source of irrigation is ground water (Ground Water Users) were selected for the study. From each district 60 samples were drawn based on land holding size. The outcome inferred that GWU small farmers had higher income from livestock, off-farm and non-farm activities than the SWU small farmers. SWU large farmers had higher farm income due to cultivation of cash crop. Thus, the study concluded that farmers were dependent on other sources of income for making a better living. Thus, this can be further achieved by promotion of self-employment and entrepreneurship among rural youth through agro-based processing and manufacturing industry.

**Keywords:** Pluri-activity, households, strategy, economy

### Introduction

Indian agriculture dominated by marginal and small holdings is the major occupation supporting 54 percent of the population for their livelihood and contributes about 17.5 percent to GDP (Anon., 2018) [5]. Since 1950, agriculture's share of GDP declined substantially; but there is minimal decrease in the numbers of persons dependent on agriculture. Hence, it still holds the place of pride in our country.

As per the Agricultural census 2015-16, the marginal and small farmers account for 86.21 percent of the total operational holdings in the country, cultivating about 47.34 percent of the operated area followed by the medium (13.22%) and large farmers (0.57%) cultivating about 43.61 and 9.04 percent of the operated area, respectively. The rapid increase in the population coupled with change in the family system from joint to nuclear and fragmentation of land holding led to decrease in size of holdings. Thus, the numerically strong but economically weaker rural community possesses an average size of operational holding of 1.08 ha in 2015-16 which has drastically declined from 2.28 ha during 1970-71 (Anon., 2018) [5]. The decline in the average size of holdings affects the scale of production, adoption of technologies, marketable surplus, credit and access to other support services (Anon., 2017) [4] and it has significant impact on the rural poverty.

Low remuneration from agriculture in contrast to higher income from alternative professions has caused the labour to migrate from primary sector to other sectors. Further, agriculture being seasonal, farmers had to look for alternative job opportunities that could provide them income through-out the year to have decent standard of living (Anon., 2015) [3]. Hence, non-farm employment plays an important role in improving the livelihood status of farm households. This could be called as pluriactivity or multiple job holding. Fuller (1990) [8] stated that the term pluriactivity originated from French word 'pluriactivite' meaning combination of agricultural activity with other gainful employment. It helps farmers to supplement their income from outside the agriculture and reduce income inequalities. Thus, to study the income sources of farm households and factors affecting the farm household's income level were assessed in the current study.

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## Methodology

Karnataka is India's eighth largest state with geographical area of 1.92 lakh sq km. Agriculture is the major occupation in state employing 60 percent of the workforce. The present study was carried out in southern and central dry zones of Karnataka. From southern dry zone, Mandya district and from the central dry zone, Tumakuru district was selected for the study. Mandya and Korategere taluks were selected from the aforesaid districts, respectively based on the irrigation sources. Agriculture in Mandya taluk is primarily dependent on water from cauvery basin (surface water) while in Korategere taluk ground water is the major source for agriculture. From each taluk, four villages were randomly selected and from each selected village, 15 sample farm households were selected. Data was collected from sample farmers using pre-tested, well-structured schedules through personal interview. A total of 120 sample farm households were interviewed for the study comprising of 30 small (<2 ha) and 30 large (>2 ha) farm households from each taluk. The households were grouped into small and large based on the size of land holding. The data on various sources of income viz., farm, off-farm and non-farm was gathered and the data was analyzed using descriptive statistics and multiple linear regression analysis.

**Multiple regression analysis to know the factors affecting income:** To examine the factors influencing the income of farm households, the farm household income was regressed in

relation to age, education, family size, land holding size and livestock size. The regression equation was framed as:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + e \dots (2)$$

Where,

Y = Annual farm household income ('000').

X1 = Age of household head (Years).

X2 = Education level of household head (No of years of schooling).

X3 = Family size (No.).

X4 = Land holding size (acres).

X5 = Number of livestock (No.).

X6 = Net investment ('000').

e = Random disturbance term.

## Results and Discussion

### Employment pattern of farm households

Employment pattern of farm households depicted in Table 1 showed the average number of days an adult individual in a family gets to work during a year. Man, day is considered a working day if the labour works for at least eight hours. The man days were calculated considering the labour participation in farm, off-farm and non-farm activities. GWU large farmers were engaged in work for maximum number of days (538 man days) followed by GWU small (512 man days), SWU large (505 man days) and SWU small farmers (497 man days).

**Table 1:** Employment pattern of farm households (man days/year)

Sources	SWU		GWU	
	Small (n=30)	Large (n=30)	Small (n=30)	Large (n=30)
Adult workers (number)	2	2	2	2
Farm	227 (45.66)	215 (42.57)	202 (39.39)	190 (36.17)
Off-farm	60 (12.08)	0 (0.00)	85 (16.62)	68 (14.01)
Non-farm	210 (42.26)	290 (57.42)	225 (43.99)	280 (49.82)
Total	497 (100.00)	505 (100.00)	512 (100.00)	538 (100.00)

**Note:** 1. Figures in the parentheses indicate percentage.

2. SWU: Surface water users; GWU: Ground water users.

### Sources of annual farm income of farm households

Sources of farm income were categorized into income from field crops, perennial crops and livestock and the results are presented in Table 2. It was found that both SWU and GWU small farmers derived more than 50 percent of their income from livestock (51.18% and 59.01%, respectively) followed by crop income and the large farmers using ground water and surface water derived majority of their income from crop cultivation due to large sized holdings. Field crops were major

income source for SWU large farmers while, perennial crops were the major source of income for GWU large farmers. For small farmers' livestock enterprise acted as regular income source as farming was unviable due to lower sized land holding and lack of irrigation. The results are aptly supported by the study of Sarkar, (2017) <sup>[11]</sup>. SWU large farmers had highest crop income due to cultivation of sugar cane. Whereas, GWU farmers had lower income due to lower returns realized from maize, ground nut and ragi.

**Table 2:** Source of annual net farm income of farm households (₹/family)

Farm income (net)	Small		Large	
	SWU (n=30)	GWU (n=30)	SWU (n=30)	GWU (n=30)
Field Crops	38,015 (48.82)	20,886 (23.09)	1,50,489 (75.65)	47,128 (27.81)
Perennial crops	0 (0.00)	16,183 (17.90)	0 (0.00)	75,117 (44.33)
Livestock	50,900 (51.18)	53,381 (59.01)	48,442 (24.35)	47,204 (27.86)
Total	88,915 (100.00)	90,451 (100.00)	1,98,931 (100.00)	1,69,449 (100.00)
Mean ±SD	78382± 39538	86138±46089	202791±69998	171229±132620
t value	0.71 NS		1.23NS	

**Note:** 1. Figures in parentheses indicate percentage.

2. NS-Non significant.

3. SWU: Surface Water Users; GWU: Ground Water Users.

**Off-farm & non-farm income of farm households**

The annual off-farm and non-farm income sources of farm households, depicted in Table 3 indicated that, non-farm income was the major source of income among all groups in comparison to off-farm income. Agricultural labour was the main off-farm income source.

GWU small and large farmers earned 23.20 and 8.09 percent of their income from off farm source while, SWU small farmers earned 10.03 percent of their income from off-farm and none of the large farmers worked as agricultural labourers.

**Table 3:** Off-farm & non-farm income of farm households (₹/family/annum)

Sources	Small		Large	
	SWU (n=30)	GWU (n=30)	SWU (n=30)	GWU (n=30)
<b>Off-farm</b>				
Agricultural labour	15,803 (100.00)	54,391 (100.00)	0 (0.00)	27,536 (100.00)
Total	15,803 (100.00)	54,391 (100.00)	0 (0.00)	27,536 (100.00)
<b>Non-farm</b>				
Non-Agricultural labour	9,900 (18.75)	2667 (2.27)	0 (0.00)	2,193 (1.53)
Business	2,800 (5.30)	14,267 (19.42)	36,000 (24.02)	28,800 (20.08)
Private job	23,933 (45.33)	24,200 (20.59)	55,700 (37.16)	47,600 (33.20)
Petty business	0 (0.00)	2,800 (2.38)	0 (0.00)	0 (0.00)
Government job	12,967 (24.56)	23,600 (27.22)	51800 (34.56)	58,600 (44.82)
Driving	2,900 (0.00)	21,530 (28.12)	6160 (4.27)	5,950 (4.15)
Transfer payments	300 (0.56)	570 (0.63)	240 (0.16)	250 (0.17)
Total	52,800 (100.00)	89,633 (100.00)	1,49,900 (100.00)	1,43,393 (100.00)
Mean ±SD	118093±66872	70210±70054	185117±136086	146793±88520
t value	2.57**		1.28NS	

**Note:** 1. Figures in parentheses indicate percentage.

2. \*\*Significant at 5 percent level of significance and NS-Non significant.

3. SWU: Surface water users; GWU: Ground water users.

Private job (45.33%) was the major source of non-farm income for SWU small farmers' followed by government job (24.56%) and non-agricultural labour (18.75%). Whereas, large farmers earned from private job (37.16%) followed by government job (34.56%) and business (24.02%). Among GWU small farmers major source of non-farm income was driving (28.12%) followed by government (27.22%) and private job (20.59%) while, GWU large farmers had government job (44.82%) as major source of income followed by private jobs (33.20%) and business (20.08%). Non-farm income generation was influenced by number of working adults in the family and their literacy level. The results were

in line with the study of Peter and Abusaleh (2002) <sup>[9]</sup>.

**Average annual income of farm households from pluriactivity**

Average income derived by farm households from various sources presented in the Table 4. revealed that, SWU and GWU small farmers derived 56.45 percent and 38.58 percent of their income from farm followed by non-farm (33.52% and 38.23%, respectively) and off-farm (10.03% and 23.20%, respectively). The per capita income of GWU small farmers was ₹ 46,895 and of SWU small farmers was ₹ 39,380.

**Table 4:** Average annual income of farm households from pluriactivity (₹/family)

Sources	Small		Large	
	SWU (n=30)	GWU (n=30)	SWU (n=30)	GWU (n=30)
Farm	88,915 (56.45)	90,451 (38.58)	1,98,932 (57.03)	1,69,449 (49.78)
Off-farm	15,803 (10.03)	54,391 (23.20)	0 (0.00)	27,536 (8.09)
Non-farm	52,800 (33.52)	89,633 (38.23)	1,49,900 (42.97)	1,43,393 (42.12)
Total	1,57,518 (100.00)	2,34,475 (100.00)	3,48,832 (100.00)	3,40,378 (100.00)
Per capita	39,380	46,895	69,766	56,730
Mean ±SD	157518±83612	205027±63321	348831±114369	326267±180657
t value	2.32**		0.59NS	

**Note:** 1. Figures in parentheses indicate percentage.

2. Significant at 5 percent level of significance and NS-Non-significant.

3. SWU: Surface Water Users; GWU: Ground Water Users.

SWU and GWU large farmers had major portion of the income from crop (57.03% and 49.78%, respectively) followed by off and non-farm income. SWU and GWU large farmers had per capita mean annual income of ₹ 69,766 and ₹ 56,730. The results are contrary to the study conducted by Singh (2003) [12] and Birthal *et al.* (2014) [7], where large farmers also had major share of their income from non-farm sources unlike small farmers due to improved literacy level.

**Factors affecting income:** Multiple linear regression model

**Table 5:** Factors affecting income of farm households (Multiple linear regression analysis results)

Sl. No.	Particulars	Co-efficient		
		Small (n=60)	Large (n=60)	
Dependent variable		Annual income ('000 ₹)		
Independent variables				
01.	Intercept	a	2.34 (1.02)	3.15*** (2.95)
02.	Age (Head of farm household in years)	b1	0.26 (1.47)	0.56 (0.89)
03.	Education (Head of farm household in years)	b2	4.73** (1.82)	3.17 (0.89)
04.	Family size (No.)	b3	5.23 (1.49)	6.19*** (3.11)
05.	Farm size (acres)	b4	13.53*** (3.59)	15.38*** (2.90)
06.	Livestock size (No.)	b5	6.83*** (6.41)	7.54*** (3.9)
07.	Net investment ('000 ₹)	b6	3.89** (2.15)	4.56** (2.04)
08.	R <sup>2</sup>		0.75	0.87
09.	Adjusted R <sup>2</sup>		0.72	0.83
10.	F		40.89***	51.23***

**Note:** 1. \*\*\*significant at 1 percent, \*\*significant at 5 percent level of significance.  
2. Figures in parentheses indicate t-value.

The regression results revealed that, factors like livestock size and farm size were significantly influencing the annual income of small farmers at one percent level of significance whereas, education and net investment were significant at five percent level. Increase in farm size by one acre would increase annual income by ₹ 13,530. With increase in education by one year annual income would go up by ₹ 4,730, as education would improve the knowledge and help the farmers in adopting new innovations and increase in net investment by one thousand rupees would increase the annual income by ₹ 3,890.

In case of large farmers, the annual income of the farm households was significantly influenced by family size, size of farm and livestock size at one percent level of significance and net investment influenced at five percent level of significance. Increase in farm size by one acre would increase income by ₹ 15380 and addition of one more livestock to the herd would increase the annual income of large farmer by ₹ 7540 from its mean level. Similar observations were made by Parvin and Ateruzzaman (2012) [10] and Ali *et al.* (2017) [11] in their studies.

### Summary and conclusion

GWU small farmers derived higher farm income from livestock, further, they also had higher earnings from off and non-farm job activities than SWU small farmers. Total income of GWU small farmers was 1.5 times higher than SWU small farmers. SWU large farmers received higher income due to cultivation sugarcane than GWU large farmers.

was used to analyse the factors affecting the income of farm households and the results are depicted in Table 4.13. Annual income was considered as dependent variable whereas factors such as age, education, family size, farm size, livestock size and net investment were taken as independent variables. Co-efficient of multiple determination was 0.75 and 0.87 in small and large farmers respectively, indicating about 75 percent and 87 percent of variation in annual income was explained by variables considered in the model.

There was no much difference in the income received by large farmers in both the zones. Education, livestock size, farm size and net investment were significantly influencing the annual income of small farmers. Whereas, family size, farm size, livestock size and net investment were the factors that significantly influenced the annual income of large farmers. The study hence proved beyond doubt that farmers were dependent on other income and not alone on agriculture as it could not make small farm households viable. Therefore, there is a need to supplement household income through suitable non-farm income generating activities within localities by averting migration. This can be achieved through promotion of self-employment and entrepreneurship among rural youth through agro based processing and manufacturing industry.

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