



## Impact of Dairy Self-Help Groups on Income and Employment of Milk Producers in Belagavi District of Karnataka

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### ABSTRACT

The study was conducted in Belagavi district of Karnataka and identified the income and employment generation through Women Dairy Self Help Groups (WDSHG). For the study, 90 members and non-members were selected randomly making a total of 180 respondents. Then, the sample was post stratified into small (1-3 milch animals), medium (4 & 5 milch animals) and large (6 & above milch animals) categories. Results of regression analysis showed that members have more monthly income from dairying than non-members. The season has found to be positive impact and it is significant, indicates that the more income in rainy season than in summer season. Also, found that average annual employment was found to be more for members as compared to non-members. In terms of time, more time spent on bringing fodder from the field. The study has concluded that WDSHG has positive impact on income and employment of members in the study area.

**Keywords:** Income, Employment, Self Help Groups, Belagavi, Karnataka

A Self-Help Group, is a small economically homogenous and affinity of group of rural poor voluntarily formed to save and mutually agree to contribute to a common fund to be lent to its members as per group decision for their socio-economic development. The objective of SHG formation is to avail credit, besides this sharing information, confidence building, group action and micro-level planning for social and economic development of its members. National Bank for Agriculture and Rural Development (NABARD) is pioneer in conceptualizing and implementing the Self-Help Group-Bank Linkage Programme (SBLP). This programme was implemented in different states of India. Under SHG-Bank Linkage programme about 79.03 lakh SHGs are linked with formal financial institutions (NABARD Report, 2015-16). About 86 per cent of the group exclusively belongs to women and this is big push to the women for income generation and empowerment (NABARD Report, 2015-16). Karnataka is the home land for both co-operatives and SHGs. It ranks first in cumulative numbers of SHGs with 9.62 lakh and have cumulative saving amount of ₹ 1442.42 crore with

formal financial institutions (NABARD Report, 2015-16). An amount of ₹ 6259.08 crore has been disbursed as loan under SHG-Bank Linkage Programme (NABARD Report, 2015-16). The members borrowed credit for several dairy activities e.g. purchasing animals, green fodder, dry fodder, concentrates and others. The key objective of SHG-Bank Linkage programme of NABARD has been to facilitate sustained access to financial services for the unreached segments of the population. Thus, it can help members to undertake income and employment generation activities.

In order to find income and employment generation by women dairy self help group, the cost and returns from milk production were estimated. Few studies focused on income and employment generation of self help groups such as increasing women participation and employment generation among rural poor are: an approach through informal groups (Puhazhendhi and Jayaram, 1999), economic performance and impact of SHGs (Madheswarana and Dharamadhikary, 2001) and impact of Self-Help Groups on socio-economic development of India (Sundaram, 2012). The mentioned studies were



focused on general Self Help Groups, but no study is available on Women Dairy Self Help Groups in India and in Karnataka State. In order to bridge the gap and realize the growing popularity of increased participation of women in WDSHG as income and employment generator, the present study was conducted to know the impact of WDSHGs has on income and employment of members in the study area.

## MATERIAL AND METHODS

For the study Belagavi district was selected purposively as it has the second highest number of SHGs in Karnataka state to identify the impact of WDSHGs on income and employment of women members. From the district, three talukas viz., Gokak, Athani and Chikkodi were selected purposively based on highest number of SHGs. From each taluka five villages were selected purposively based on presence of Women Dairy Self Help Groups. Then, two WDSHGs from each village and three members from each WDSHG were randomly selected. Then, total of 90 members and 90 non-members of similar socio-economic status were selected making a total of 180 respondents. Later data were post stratified into small (1-3 milch animals), medium (4 & 5 milch animals) and large (6 & above milch animals) by using cumulative square root frequency method.

Primary data was collected for two seasons viz., rainy and summer, from members and non-members by using personal interview schedule. The collected data were scrutinized, tabulated and subjected to analysis. Regression analysis was adopted to identify the impact of income and employment on women membership of WDSHG given below.

### Selection and Specification of Variables

Here dependent variable is gross income from dairying and the independent variables were education score of the women earner, age of the respondent, number of dairy cattle, value of green fodder fed per day, value of dry fodder fed per day, value of concentrate fed per day and value of labour per animal per day has taken.

### Educational Score of the respondents

Education is considered as important factor which affects

income from dairying activities. The scale prepared by Trivedi and Pareek (1963) to measure the education level of rural families was used, the weightage of which are as follows: Illiterate-0, Read and write-1, Primary-2, Secondary-3, High School-4, Intermediate-5, Graduation and above-6.

**The Model:** The functional form of model was specified as follows:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7)$$

Where,

$Y$  = Gross income from dairy (₹)

$X_1$  = Education score of the women respondents

$X_2$  = Age of the respondent (years)

$X_3$  = Number of milch animals (in number.)

$X_4$  = Value of green fodder fed per day (₹)

$X_5$  = Value of dry fodder fed per day (₹)

$X_6$  = Value of concentrate fed per day (₹)

$X_7$  = Value of labor per animal per day (₹)

Pooled income functions were also fitted using two dummy variables, one for membership and the other for season. The two dummy variables were introduced as under:

$D_1 = 1$ , if Member

$D_1 = 0$ , otherwise (Non-member)

$D_2 = 1$ , if Rainy

$D_2 = 0$ , otherwise (summer)

### Choice and specification of model

The choice of a specific functional form was based on economic, statistical and econometrics criteria i.e. sign and value of the estimated parameters while statistical criteria depend on the statistical significance of estimated parameters and co-efficient of multiple determination ( $R^2$ ). Four types of functional forms, viz. Cobb-Douglas, Linear and Semi log (both linear-log and log-linear models) were tried whose algebraic forms are given as:

$$\text{Linear Form } Y = a + \sum_{i=1}^7 b_i X_i + u$$

$$\text{Cobb-Douglas Form } Y = a \prod_{i=1}^7 X_i^{b_i} e^u$$

$$\text{Semi Log (Log-Lin) Form } \ln Y = a + \sum_{i=1}^7 b_i X_i + u$$

$$\text{Semi Log (Lin-Log) Form } Y = \ln a + \sum_{i=1}^7 b_i \ln X_i + u$$

Where,

Y = Gross income from dairy

$X_i$  =  $i^{\text{th}}$  explanatory variable,

A = Constant term,

$b_i$  = Partial regression coefficient of the  $i^{\text{th}}$  explanatory variable,

U = Random error distributed normally with zero mean and constant variance.

### Employment Generation

For employment estimation considered the actual time spent by women and other family members in various operations of dairy farming was recorded for each household. Total time spent was converted into man days by assuming 8 working hours. The following conversion was used:

1 day of women labor = 0.67 man day (3 women = 2 men)

1 day of children work = 0.5 man days (2 children = 1 men)

Number of hours per day in different types of activities for members and non-members in the study area was calculated and aggregated to work out the utilization of women's time in dairy operations.

## RESULTS AND DISCUSSION

### Women members and Non-members Income from Dairy

A perusal of Table 1 reveals the overall monthly income from dairy for members and non-members across different herd size categories.

The overall mean monthly net income was found to be slightly higher for members (₹ 1804.75) as compared to non-members (₹ 1396.79) and the difference was significant at 1 per cent level of significance. To find whether WDSHG has impact on the income of women members has been analyzed by employing functional analysis. The income function was for local cow, crossbred cow and buffalo was done separately. Among four models Cobb-Douglas function was found to be best fit for all cases and hence, it was chosen for further economic analysis.

The results of partial regression coefficients of Cobb-Douglas production function were presented in the table 2. The Coefficients of Cobb-Douglas production function represents the elasticity i.e. what per cent the dependent variable would change if the explanatory variable changed by one per cent.

The results of partial regression shows that income function for local cow was 73.22 per cent of total variation explained by the independent variable included in the function, it was 80.87 per cent for crossbred and for buffalo 90.14 per cent. The variables such as number of milch animals and value of concentrate were found have a positive and significant impact on gross income of from local cow. An increase of number of dairy cattle by one per cent will increase the gross income by 0.4765 per cent. Similarly, a one per cent increase in cost of concentrate would increase the gross income by 0.2958 per cent.

Similarly, the variables education of respondents, number of milch animals, value of concentrate and value of labor employed were found have a positive and significant impact on gross income of from crossbred. A one per cent increase in respondent's education will increase the gross income by 0.0295 per cent. When the number of dairy cattle was increase by one per cent, the gross income increase by 0.4549 per cent. When one per cent increase in cost of concentrate, the gross income increased by 0.1427 per cent. Similarly, when one per cent increase in value of labor employed, the gross income increased by 0.1233 per cent.

Similarly, the variables number of milch animals, value of green fodder, value of concentrate and value of labor employed were found have a positive and significant impact on gross income of from buffalo. With a one per cent increase in number of milch animals, the gross income increase by 0.4247 per cent while an increase of

**Table 1:** Overall Monthly Income from dairy for WDSHG's member and non-member across different herd size categories

(₹ /Month/Household)

Herd Category	Member			Non-member			Mean Difference in income	't' - Value
	Gross income	Gross cost	Net income	Gross income	Gross cost	Net income		
Small	12040.23	10736.77	1303.46	10120.10	9289.27	830.80	472.65**	#4.29
Medium	16701.15	14608.05	2093.10	14760.50	13276.87	1483.64	609.46**	2.81
Large	25754.33	22653.88	3100.44	23977.70	21930.79	2236.25	864.19**	2.11
<b>Overall</b>	<b>15517.03</b>	<b>13712.28</b>	<b>1804.75</b>	<b>13782.98</b>	<b>12386.19</b>	<b>1396.79</b>	<b>407.96</b>	<b>#3.08</b>

\*\*significance (&lt;0.01) level #Z-test

**Table 2:** Partial Regression coefficient of Income Function for Local cow, Crossbred and Buffalo

Variables	Local cow		Crossbred		Buffalo	
	Regression coefficient	Standard error	Regression coefficient	Standard error	Regression coefficient	Standard error
Constant (a)	3.2162**	0.3658	4.1754**	0.3796	4.1765**	0.4570
Education score ( $X_1$ )	0.0039	0.0383	0.0295*	0.0148	0.0049	0.0180
Age of respondents ( $X_2$ )	-0.0213	0.0753	-0.0074	0.0806	-0.1671	0.0992
Number of milch animals ( $X_3$ )	0.4765**	0.0542	0.4549**	0.0457	0.4247**	0.0546
Value of green fodder ( $X_4$ )	-0.0036	0.0525	0.0047	0.0497	0.0914*	0.0443
Value of dry fodder ( $X_5$ )	0.0395	0.0365	0.0127	0.0322	0.0706	0.0392
Value of concentrate ( $X_6$ )	0.2958**	0.0371	0.1427**	0.0458	0.1354**	0.0432
Value of labour employed ( $X_7$ )	0.0847	0.0685	0.1233**	0.0461	0.1612**	0.1612
D1 (Membership)	0.0608*	0.0249	0.1118**	0.0161	0.0458*	0.0197
D2 (Season)	0.0577	0.0383	0.0508*	0.0232	0.0358	0.0288
R-square	0.7322		0.8087		0.9041	
Number of animals	324		346		144	

\*significant (p&lt;0.05) \*\* significant (p&lt;0.01)

one per cent of value of green fodder will increase the gross income by 0.0194 per cent. In case of value of concentrate, a one per cent increase will increase the gross income by 0.1354 per cent. Similarly, with a one per cent increase in value of labor employed, the gross income increased by 0.1612 per cent.

Value of dry fodder was found positive and insignificant for local cow, crossbred and buffalo. The effect of age of the respondents was found to be negative and insignificant for local cow, crossbred and buffalo. With an increase in one per cent of the age of respondents, the gross income decreased by 0.0213, 0.0074 and 0.1671 per cent for local cow, crossbred cow and buffalo, respectively. To find the impact of WDSHG, the dummy variable ( $D_1$ ) was used

whose value was found to be positive and significant for local cow, crossbred and local cow implying that WDSHG's has a positive impact on gross income of member group. Similarly, to find seasonal impact seasonal dummy ( $D_2$ ) was introduced and was found to be positive and significant for crossbred. But, for local cow and buffalo it was positive but insignificant. Hence, it implies that crossbred generate higher gross income in rainy as compared to summer season.

### Members and Non-members Employment by Dairy

Table 3 reveals the average annual human-days of employment for member and non-member households across different herd size categories.

**Table 3:** Average annual man-days in dairy activities by groups across different herd size categories

*(Man-days/annum/household)*

Herd category	Member	Non-member	Mean Difference	't' – value
Small (1-3)	120.26	94.06	26.20**	#3.50
Medium (4 & 5)	202.19	172.68	29.50**	2.81
Large ( $\geq 6$ )	314.95	260.79	54.14**	2.35
Overall	212.46	175.84	32.13**	#2.58

\*\* Significant (P&lt;0.01) # Z-value

**Table 4:** Average family labor utilization in dairy enterprise by groups across herd size categories

*(Man days /annum)*

Herd category	Member				Non-member			
	Men	Women	Children	Total	Men	Women	Children	Total
Small (1-3)	62.34 (51.84)	51.88 (43.14)	6.04 (5.02)	120.26 (100.00)	48.34 (51.39)	40.54 (43.01)	5.26 (5.59)	94.06 (100.00)
Medium (4 & 5)	100.73 (49.82)	89.25 (44.14)	12.21 (6.04)	202.19 (100.00)	88.81 (51.43)	74.40 (43.09)	9.47 (5.48)	172.68 (100.00)
Large ( $\geq 6$ )	162.71 (51.66)	135.12 (42.90)	17.13 (5.44)	314.95 (100.00)	132.04 (50.63)	112.92 (43.30)	15.83 (6.07)	260.79 (100.00)
<b>Overall</b>	<b>108.59</b> <b>(51.10)</b>	<b>92.08</b> <b>(43.30)</b>	<b>11.97</b> <b>(5.60)</b>	<b>212.46</b> <b>(100.00)</b>	<b>89.73</b> <b>(51.03)</b>	<b>75.95</b> <b>(43.19)</b>	<b>10.18</b> <b>(5.78)</b>	<b>175.84</b> <b>(100.00)</b>

**Table 5:** Average labour utilization by different activities in dairy farming for WDSHG member and non-member households

*(Hours/ day)*

Operations	Member				Non-Member			
	Men	Women	Child	Total	Men	Women	Child	Total
Bringing fodder	0.51	0.36	0.06	0.93	0.46	0.32	0.04	0.82
Chaff cutting	0.32	0.38	0.07	0.77	0.28	0.34	0.05	0.67
Feeding	0.28	0.32	0.06	0.66	0.24	0.28	0.05	0.57
Grazing	0.34	0.31	0.05	0.70	0.31	0.28	0.04	0.63
Giving water	0.13	0.18	0.05	0.36	0.11	0.15	0.04	0.30
Cleaning cattle shed/animal	0.19	0.35	0.05	0.58	0.15	0.31	0.03	0.49
Health care	0.18	0.23	0.04	0.46	0.14	0.19	0.04	0.37
Milking	0.16	0.15	—	0.31	0.12	0.21	—	0.24
Making milk products	0.04	0.35	0.01	0.40	0.05	0.27	0.01	0.33
Selling milk	0.15	0.29	0.06	0.50	0.16	0.23	0.04	0.43
Miscellaneous works	0.19	0.23	0.07	0.49	0.12	0.17	0.07	0.36
Total time spent	2.49	3.15	0.52	6.16	2.14	2.66	0.41	5.21
Human hours	2.49	2.11	0.26	4.86	2.14	1.78	0.21	4.13





For members, annual human days of employment (212.46 man days) were found to be higher as compared to non-members (175.84 man days). The difference between the mean human-days of employment for members and non-members was found to be statistically significant implying that WDSHG helps in generating employment for opportunities for member group.

The average family labor use in dairy farming for WDSHG members and non-members is shown in table 4. For members, the average number of human-days (92.08 man days) of employment in a year was higher as compared that of non-members (75.95 man days). In terms of percentage contribution of women involved in dairy activities, it was found to be almost same for members (43.30 per cent) and non-members (43.19 per cent).

The average labour utilization by different activities in dairy farming for WDSHG member and non-member households is shown in Table 5. From the table it is seen that both member and non-members of WDSHGs spent more time in bringing fodder from fields. For members it was 0.93 hours/day and for non-members, 0.82 hours/day. Also, the table shows that members and non-members spent more time chaffing the fodder, i.e., member (0.77 hours/day) and non-members (0.67 hours/day). These results were in conformity with the earlier study done by Devi (2010). From the table it also clear that women spent more time in chaff cutting, bringing fodder, cleaning cattle shed/animals, making milk products feeding and grazing in both members and non-members. It was found that members (0.35 hours/day) spent more time for making milk products than non-members (0.27 hours/day). Both members and non-members make milk products like curd, butter, ghee etc., in study area. Also, in both cases, children were found to be involved in all dairy activities to some extent, except for milking.

## CONCLUSION

The study assessed the impact of Women Dairy Self Help Groups (WDSHGs) on income and employment of milk producers in the study area. For the member group, monthly net income was more as compared to non-members and the difference was statistically significant. The regression coefficients of variables number of dairy cattles and value of concentrate has positive and significant for local cow, crossbred cow and buffalo. The dummy variable ( $D_1$ ) for

membership of WDSHGs was found to be positive and significant implying that membership of WDSHG has a positive impact on gross income from the dairying. Similarly, seasonal dummy ( $D_2$ ) was found to be positive and significant for crossbred, but for local cow and buffalo. Also, average annual man days of employment were found to be higher for members as compared to non-members. Particularly women members and non-members were spent more time for chaff cutting. Also found that both members and non-members of WDSHG spend time to make milk products like curd, butter, ghee etc. in the study area.

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