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AN EMPIRICAL SCENARIO OF GROWTH AND DEVELOPMENT THROUGH DAIRY SELF-HELP GROUPS (SHGS) IN KANPUR NAGAR DISTRICT OF UTTAR PRADESH

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ABSTRACT

The study concluded that the per day average net cost of maintaining a buffalo, crossbred cow and local cow was relatively higher in case of SHG member households as compared to Non-SHG member households. This was due to the fact that SHG member will producers adopted better feeding and management practices to achieve higher levels of milk yield. the overall average net income per day in the case of buffaloes and crossbred cows was higher in SHG member households as compared to non-SHG member households. In the case of local cows the net income earned per milch animal per day was comparatively higher in Non-SHG member households as compared to SHG member Households, due to higher net maintenance cost incurred by member households, chow test concluded that production functions of milk differed significantly between SHG member and non-SHG member households. The coefficient for the constant dummy was also found to be positive and significantly in milk production functions, which indicated positive impact of finance through SHGs on returns from dairy units.

Key Words : *Self-help groups, Microfinance, Milk production, cattle shed, Household*

Micro-finance campaign through women SHGs has initiated New forms of institutions and organisational structures that make it feasible for the poor to get uncollateralized loans (Khawari, 2004). In recent years the self help group. (SHG) approach to poverty alleviation is getting recognition in the Asian countries. Mostly women are mobilized into groups for undertaking mutually beneficial social and economic activities. The group provides a base for self-employment and empowerment through group dynamics. In India, these Mutual help based groups are known as self help groups. Very few empirical studies has been conducted in Uttar Pradesh, on the growth and development of SHGs (jairath, 2001), issues in informal finance and perspectives from a Uttar Pradesh village (Howard and Jones, 2006). This clearly shows that there is limited work on the economic evaluation of Rural financing for dairy farming through SHGs in India as well as in Uttar Pradesh.

Uttar Pradesh is the largest state with the geographical area of 346.12 million hectare representing 16.72 percent area of the country with 26.98 million cattle and 22.61 million buffaloes ranks second among the top ten milk producing states with 18.07 million tonnes of milk production Per annum. Being a backward and Arid region, dairying is the main source of income and employment with state. The government institutions and NGOs are actively involved in SHG formation for the socio-economic development of low income groups. Preliminary investigation reveals that more than 50 percent of the SHGs are engaged in dairy activities for several dairy activities, viz., for purchasing animals, dry fodder, green fodder, concentrates and others. They have excellent repayment capacity and a majority of them are women SHGs working in the area. To understand the economics of milk production, it is essential to study the implicit and explicit cost that goes into its production. Generally, a dairy farmer can increase his income from the dairy sector in two ways, (i) by increasing milk production and (ii) by reducing cost of milk production. The second alternative could be achieved through judicious use of various factors of production. Hence, the analysis of cost of milk production across various Milch species, constitutes an important aspect of bovine husbandry. In order to bridge this gap and realise the growing popularity of SHG concept in development interventions, a research study was undertaken to examine the economic impact of dairy self-help groups in Kanpur Nagar District of Uttar Pradesh.

The analysis of cost and returns of milk Production for SHG members is essential for studying the economics of dairy enterprises for their loan recovery performance, net income earned etc. The cost of milk production should be minimised to make dairy, a profitable enterprise for the SHG members.

Badatya *et al.,* (2006) studied the impact evaluation of SHGs in Andhra Pradesh and found that dairy units constituted a major share (31.8 percent) and total cost for dairy units was Rs. 252.05. The gross income worked out to be Rs. 33025 per unit per annum with net income at Rs. 7820.

Sirohi *et al.,* (2007) conducted a study on the economics of milk production in Kavnal District of Haryana and reported that the average net maintenance cost per day per Milch animal was Rs. 48.67 and Rs. 65.33 for buffaloes and crossbred cows, respectively. The per litre of cost of milk production was estimated as Rs. 10.68 and Rs. 7.90 for buffaloes and crossbred cows, respectively.

Mian *et al.,* (2007) conducted a study on the impact of dairy farming on livelihood of participating women in Rangpur District of Bangladesh and reported that the total cost of maintaining a dairy cow was found to be taka 10661.65 per lactation. The cost of feed and feeder was the major cost item, which constituted 55.77 percent of the total cost, followed by labour (27.90 percent).

Meena (2008) studied the impact of diary co-operatives on the economy of Rural households in Alwar District of Rajasthan and found that the per day average net cost of maintaining a buffalo was relatively higher for the SHG member groups (Rs. 47.99) than for non-SHG member groups (Rs. 44.22), while the corresponding figures for maintaining a cow were Rs. 38.42 and Rs. 36.56 respectively. The per litre cost of buffalo milk production worked out at Rs. 11.43 and Rs. 11.76 and that of cow milk production, Rs. 10.20 and Rs. 10.50 for both the groups, respectively.

RESEARCH METHODOLOGY

It is pertinent to study the cost of milk production, as it enables us to comprehend the intricate issues involved in milk production and as it constitute the most important indicator of economics of milk production. Various cost components identified can be broadly classified into 'fixed cost' and 'variable cost' fixed costs include costs which remain unchanged over a short period of time variable costs are those costs that vary with the level of milk production.

Variable costs include those recurring expenditure in milk production which are incurred on green fodder, concentrates, labour, veterinary expenditure and miscellaneous expenses.

Apportionment of joint costs

Among the various items of cost of discussed above. The farmers incurred certain expenses for the entire herd on the farm for instance, fixed assets like cattle shed, stores, managers, buckets, chaims etc are jointly used for animals of all age groups and either sex for the apportionment of such joint expenses on per animal basis, the number of animals with the farmer, comprising adult young male and female animals, were converted into standard animal units (SAGs) by using the ratios suggested by Patel *et al.* (1982). Hence the total expenses of a household on the joint cost items; depreciation and interest on fixed assets, Human labour miscellaneous cost were apportioned among individual animals by dividing the total expenses by the standard animal unit to arrive at the cost per SAH basis.

Unit Cost of Milk Production

In order to work out the per Litre cost of milk production the average maintenance cost per milch animal per day was divided by the average milk yield per day of respectively milch animal.

Returns

Returns from milk production were calculated as follows :

Gross income = value of milk + dung

Net income = Gross income – gross cost

Family Labour income = Net income + family labour wage.

Other cost concept

The various cost concepts employed in this study are specified as under :

Cost A = Expenditure on feed and fodder + veterinary expenditure + expenses on hire Human Labour + Miscellaneous Expenditure + Depreciation on fixed assets.

Table-1: Maintenance cost of Dairy Animals for SHG member and Non-SHG member Households. (Rs./Milch animal/day).

Particulars items of cost	Member			Non-member		
	Cross bred			Cross bred		
	Buffalo	Cow	Local cow	Buffalo	Cow	Local cow
Fixed cost						
(i) Depreciation on fixed assets	3.78 (7.22)	4.07 (7.34)	2.91 (6.92)	2.86 (6.85)	3.08 (6.84)	2.20 (7.06)
(ii) Interest on fixed assets	7.29 (7.60)	4.11 (7.42)	2.94 (7.27)	2.88 (6.91)	3.10 (6.89)	2.22 (7.13)
(A) Total fixed cost	11.07 (14.51)	8.18 (14.76)	5.85 (14.19)	5.74 (13.76)	6.18 (13.73)	4.42 (14.19)
Variable cost						
(iii) Green fodder	7.70 (14.70)	8.05 (14.52)	6.58 (15.92)	7.01 (16.80)	7.33 (16.28)	5.12 (16.44)
(iv) Dry fodder	11.45 (21.87)	12.39 (22.35)	9.13 (22.14)	10.63 (25.47)	11.30 (25.10)	7.70 (24.73)
(v) Concentrates	15.73 (30.03)	16.18 (29.19)	12.08 (29.41)	11.41 (27.34)	12.74 (28.30)	8.57 (27.52)
Total feed cost	34.88 (66.60)	36.62 (66.06)	27.79 (67.47)	29.05 (69.61)	31.37 (69.68)	21.39 (68.69)
(vi) family Labour	9.22 (17.61)	9.91 (17.88)	7.08 (16.96)	6.39 (15.31)	6.88 (15.28)	4.91 (15.77)
(vii) Veterinary and miscellaneous expenditure	0.67 (1.28)	0.72 (1.30)	0.52 (1.38)	0.55 (1.32)	0.59 (1.31)	0.42 (1.35)
(B) Total variable cost	44.77 (85.49)	47.255 (85.24)	35.59 (85.81)	35.99 (86.24)	38.84 (86.27)	26.72 (85.81)
Gross cost (A+B)	55.84 (100.00)	55.43 (100.00)	41.24 (100.00)	41.73 (100.00)	45.02 (100.00)	31.14 (100.00)
(C) Value of Dung	2.18	2.16	1.87	2.06	2.00	1.78
rightNet cost (A + B – C)	53.66	53.27	39.37	39.67	43.02	29.36

Figures in parameters indicate the percentage of gross cost.

Cost B = Cost A + interest on fixed investment.

Cost C = Cost B + imputed value of family Labour.

Estimation of milk production Function

Milk production function is basically a Technical and mathematical relationship between input resources used in the production process and its final output. Production function provides us knowledge on the kind and quality of input resources, which are employed in the production processed. Value of Milk was stipulated to be dependent variable. The value of green fodder, value of dry fodder, value of concentrates, value of Human Labour and Expenses on veterinary services were stipulated as explanatory variables.

The Model :

The functional form, thus was specified as follows :

$Y = f (X_1, X_2, X_3, X_4, X_5, D_1)$.

Where,

Y = value of Milk Produced per animal per day (Rs.)

X_1 = value of green fodder fed per animal per day (Rs.)

X_2 = value of dry fodder fed per animal per day (Rs.)

X_4 = value of Labour utilized per animal per day (Rs.)

X_5 = value of veterinary services per animal per day (Rs.)

Table-2: Cost and income measures for milk production across SHG member and non-SHG member household (Rs./Milch animal/day)

Particulars	Member	Non-Member				
	Buffalo	crossb red cow	Local cow	Buffalo	cross bred cow	Local cow
1. Items of cost/income						
Cost concepts						
(i) Expenditure on feed & fodder	34.88	36.62	27.79	29.05	31.37	21.39
(ii) Miscellaneous expenditure	0.67	0.72	0.52	0.55	0.59	0.42
(iii) Imputed value of family Labour	9.22	9.91	7.08	6.39	6.88	4.91
(iv) Depreciation on fixed assets	3.78	4.07	2.91	2.86	3.08	2.20
(v) Interest on fixed investment	3.82	4.11	2.94	2.88	3.10	2.22
(vi) Cost A = 1 + 2 + 4	39.33	41.41	31.22	32.46	35.04	24.01
(vii) Cost B = Cost A + interest on fixed investment	43.15	45.52	34.16	35.34	38.14	26.23
(viii) Cost C = Cost B + Imputed value of family Labour	52.37	55.43	41.24	41.73	45.02	31.14
2. Income measures						
(ix) Value of milk	60.77	67.39	40.00	46.82	51.41	31.98
(x) Value of Dung	2.18	2.16	1.87	2.06	2.00	1.78
(xi) Gross income (9 +10)	62.95	69.55	41.87	48.88	53.41	33.76
(xii) Farm Labour income (11-6)	23.62	28.14	10.65	16.42	18.37	9.75
apdefault(xiii) Family Labour income (11-7)	19.80	24.03	7.71	13.54	15.27	7.53
(xiv) Net income (11-8)	10.58	14.12	0.63	7.15	8.39	2.62
3. Per Litre cost of milk production	12.61	8.72	12.30	12.67	8.76	11.29

D = 1, Households who have access to SHG members Loans (members)

D = 0, Households who do not have access to SHG Loans (Non-members)

Sampling

The study was carried out in Kanpur Nagar. District of Uttar Pradesh during 2010-11. The detailed information required for the study was collected from each of the selected households from Bilhaur and Ghatampur Tehsils. A list of three year old SHGs was prepared from the selected cluster of villages with in each Tehsil and only those SHGs predominantly involved in dairy farming activities were selected. The top of five SHGs from each set of villages from each Tehsil were selected for further investigation, thus making a total of 20 SHGs for the study. A complete enumeration of all the members of these selected twenty SHGs was carried out and these members who were predominantly involved in dairying, i.e., 84 dairy members, constituted the sample for the present study. A matching sample of 84 non-SHG members involved in dairy activities was randomly taken from the selected clusters of villages. The primary data was collected from sample households on various parameters through a well-structured and pre-Tested questionnaire.

RESULTS AND DISCUSSION

A perusal of Table-1 reveals that the per day average net cost of maintaining a buffalo was relatively higher in case of SHG member households (Rs. 53.66) as compared to non-SHG Member households (Rs. 39.67), while the corresponding figures for maintaining a crossbred cow were Rs. 53.27 and Rs. 43.02 respectively. Similarly, the net cost of maintaining a local cow was Rs. 29.36 for non-SHG member households. This was due to the fact that the member milk producers adopted better feeding and management. Practices to achieve higher levels of milk yield. A sizeable portion of the total cost of milk production was accounted for the feed costs followed by Labour costs in case of all the three models.

The variable costs accounted for about 86 per cent and fixed costs for 14 percent in the total cost of milk production. Kalra et al. (1995) also observed the share of variable and fixed costs to be approximately 85 and 15 percent of the gross costs respectively. The relatively higher maintenance cost for member households observed in the present study was in

Table-3: Estimated Parameters of milk production function for Buffaloes.

Variables	Member		Non-Member	
	Regression coefficient	Standard error	Regression coefficient	Standard error
Constant term	29473**	0.1333	3.3285**	0.2442
value of green fodder (X1)	0.1853**	0.0880	0.2458**	0.1161
tlparvalue of dry fodder (X2)	0.0869	0.0635	0.1320	0.1233
value of concentrates (X3)	0.1392**	0.0479	0.1415	0.1516
value of Labour (X4)	0.0663	0.0375	-0.0253	0.0731
Veterinary Expenditure (X5)	0.0253	0.0466	01816	0.0471
R2	0.55	_	0.08	_
N	F value of chow test	_	55	_

Table-4: Estimated Parameters of milk production function for Buffaloes using constant dummy team.

Variables	Regression coefficient	Standard error
Constant term	3.0697**	0.1211
value of green fodder (X1)	0.1212**	0.0594
value of dry fodder (X2)	0.0192	0.0700
value of concentrates (X3)	0.1243**	0.0551
value of Labour (X4)	0.0791**	0.0342
Veterinary Expenditure (X5)	-0.0671**	0.0305
Constant Dummy	0.1890**	0.0312
R2	0.56	
N	132	

Significant ($P < 0.01$)

conformity with the findings of Chand et al. (2002), Aitawade et al. (2005) and Shiyani and Singh (1995).

Cost of milk production and income Measures:

A comparative analysis of maintenance cost, per Litre cost of Milk Production and various income measures for buffaloes, crossbred cows and local cows for SHG member and non-SHG member households have been presented in Table-2.

The overall average cost-A, cost-B and cost-C per milch animal per ay for Buffalo were observed to be Rs. 39.33, Rs. 43.15 and Rs. 52.17 for SHG member households which were relatively higher than Rs. 32.46, Rs. 35.34. Rs. 41.73 observed for Non-SHG member households on an average. The per Litre cost of milk production for Buffaloes was Rs. 12.61 for the SHG member households and Rs. 12.67 in the cost of non-SHG member households. The overall average per day gross income, farm Labour income, family Labour income and net income per day in the case of Buffaloes were found to be Rs. 62.95, Rs. 23.62, Rs. 19.80 and Rs. 10.58 for SHG member households and Rs. 48.88, Rs. 16.42, Rs. 13.54 and Rs. 7.15 for non-SHG member households respectively.

All the income measures were estimated to be higher for member households than for Non-member households, suggesting that the accrual of income was better for SHG members who had access in microfinance facilities.

In the case of crossbred cows, the overall average cost-A, cost-B and cost-C per milch animal were observed to be Rs. 41.41, Rs. 45.52 and Rs. 55.43 for SHG member households which were relatively higher than the costs at Rs. 35.04, Rs. 38.14 and Rs. 45.02 for non-SHG member households on an average, the per Litre cost of milk production for crossbred cows was Rs. 8.72 for the SHG member households and Rs. 8.76 in the case of Non-SHG member households. The overall average per day gross income, farm Labour income, family labour income and Net income in the case of crossbred cows were found to be Rs. 69.55,

Table-5 : Estimated Parameters of milk production function for function for crossbred cows.

Variables	Member	Non-Member		
	Regression coefficient	Standard error	Regression coefficient	Standard error
Constant term	3.3768**	0.1927	4.1167**	0.2381
Value of green fodder (X1)	0.0543**	0.789	0.3227**	0.1253
Value of dry fodder (X2)	0.0271	0.1337	0.0418	0.1241
Value of concentrates (X3)	0.1758**	0.0716	0.1656	0.1241
Value of Labour (X4)	0.0998	0.0561	0.0066	0.0783
Veterinary Expenditure (X5)	-01846**	0.0675	-0.0489	0.598
R^2	0.53	_	0.47	_
N	65	_	53	_
F-value for chow test			8.44**	

Significant (P < 0.01)

Table-6: Estimated Parameters of milk production function for crossbred cows using constant Dummy Term.

Variables	Regression coefficient	Standard error
Constant term	3.8242**	0.1450
value of green fodder (X1)	0.0408	0.0666
value of dry fodder (X2)	-0.0032**	0.0859
value of concentrates (X3)	0.1704**	0.629
value of Labour (X4)	0.0483	0.0438
Veterinary Expenditure (X5)	-0.0841**	0.0412
Constant Dummy	0.2375	0.0383
R^2	0.58	
N	118	

Rs. 28.14, Rs. 24.03 and Rs. 14.12 for SHG member households which were higher than corresponding income measures of Rs. 53.41, Rs. 18.37, Rs. 15.27 and Rs. 8.39 respectively for Non-SHG member households.

The overall average cost-A, cost-B and cost-C per milch animal per day for local cows were observed to be Rs. 31.22, Rs. 34.16 and Rs. 41.24 for SHG member households which were relatively higher than Rs. 24.01, Rs. 26.23 and Rs. 31.14 for Non-SHG member households on an average, the per Litre cost of milk production for Local cows was Rs. 12.30 for the SHG member households and Rs. 11.29 in the case of Non-SHG member households.

The overall average gross income, farm Labour income, family Labour income and net income per day in the case of Local cows were Rs. 41.87, Rs. 1065, Rs. 7.71 and Rs. 0.63 for SHG member households which were more than the corresponding incomes of Rs. 33.76, Rs. 9.75, Rs. 7.53 and Rs. 2.62 observed for non-SHG member households. It is, therefore, noted that the net income earned per Milch animal per day for local cows was comparatively higher in non-SHG member households as compared to SHG member households. Lower net income earned per Milch animal for SHG member households could be attributed to higher net maintenance costs incurred by SHG member households which may be due to poor management practices adopted by SHG member households for Local cows and also very few SHG members were rearing Local cows in the study area as compared to non-SHG members due to Lower Milk yield in comparison to crossbred cows and buffaloes.

The finding observed in the present study were in conformity with those of Shukla et al. (1995), Rao and Singh (1995) and Chandra (2002) who reported per Litre cost of Buffalo as well as cow milk production to be lower in programme area/member households/ Beneficiary households as compared to Non-programme area/non-member/non-beneficiary households.

Milk production function for Buffaloes

Table-3, presents the results of estimated Cobb-Douglas production function for buffaloes for the SHG member and non-member households.

The coefficient of Multiple determination (R2) for the member households and non-member households were 0.55 and 0.48 respectively which indicated that 55 and 48 percent of the total variation in the returns from milk, were explained by the variables included in the selected regression model. The regression coefficient of green fodder and concentrates showed positive and significant influence on returns from buffalo milk in SHG member households which indicated that the returns from buffalo milk increased with an increase in the value of green fodder and concentrates. The regression coefficient for value of dry fodder, Labour and veterinary expenses were positive and non-significant indicating their non-significant influence on returns from buffalo milk in case of non-SHG member households. This clearly suggests that the returns from buffalo milk increased with the increase in the value of green fodder. The value of Dry fodder and concentrates had positive but non-significant influence on returns from buffalo milk, while the Labour and veterinary expenses had negative and non-significant influence on returns from buffalo milk in case of non-SHG member households.

The results of chow test clearly showed that the production function of Buffalo milk differed significantly ($P < 0.01$) between member and non-member households. The coefficient of the constant dummy was found to be positive and statistically significant ($P < 0.01$) as given in table-4 which indicated a positive impact of finance on returns from milk for the member households.

The positive and significant impact of green fodder and concentrates on returns from milk were in conformity with the findings of the earlier research works was reported by Meena (2005).

Milk Production Function for crossbred cows:

Table-5, presents the results of estimated Cobb-Douglas production function for crossbred cows in the study area for the SHG member and non-SHG member households. A close perusal of the table reveals that the coefficient of multiple determination (R2) for the member and non-member households were 0.55 and 0.47, respectively, which indicated that 53 and 47 percent of the total variation in returns from milk were explained by the variables included in the regression function.

The regression coefficient of the concentrates showed positive and significant influence on returns from crossbred cow milk in member households which indicated that returns from crossbred cow milk increased with an increase in the value of concentrates. The value of green fodder, Dry fodder and Labour showed positive and non-significant influence on returns from crossbred cow milk in SHG member households, while the regression coefficient of veterinary expenses was negative and significant, indicating its influence on returns from crossbred cow milk production. In case of non-SHG member households, the regression coefficient of green fodder was positive and significant which indicated that the returns from crossbred cow milk. The results of chow test showed that the production functions of crossbred cow milk differed significantly ($P < 0.01$) between and non-member households which indicated that there was a structural shift in the milk production function of SHG member and non-SHG member households. The coefficient of the constant dummy was found to be positive and statistically significant ($P < 0.01$) provided in Table-6, indicating positive impact of SHG loans on returns from milk for SHG member households.

This may plausibly be due to the efforts made by SHG in providing concentrates through additional funds made available to the members. The positive and significant impact of green fodder and concentrates on returns from milk, were in conformity with the findings reported by Sinha and Singh (1999) and Meena (2008).

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