

The Economic Impact of the Dairy and Organic Farming: Naniborvai Village

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Abstract

Naniborvai village of Aravalli District, Gujarat constitutes of seventy-five farmers and depends upon agriculture (both farming and animal husbandry) for their livelihood. Dairy farming plays a pivotal role in the farmer's life by providing additional income along with achieving the major goal of organic farming. Most of the farmer's landholding size is less than two acres and is classified into the category of marginal and small farmers. There are 245 livestock animals such as buffaloes and buffalos which play a major role in the farm ecosystem of the village. After the formation of dairy unit livestock farming reemerges with conventional farming and there is a paradigm shift to organic methods. Using organic manure farmers start gaining maximum yields by protecting the environment and health. Present article provides some insight on the employment opportunities generated and the improvement in the standard of living of villagers which therefore is an important dimension of local economic development. In economical aspect, it's a clear shift from linear to circular economy, which is the key aspect of village sustainable economic growth.

Back Ground

Amrita SeRve was launched during on Mātā Amritānandamayī Devī (Amma's) 60th birthday in September 2013 and ushered in sustainable development in village clusters across India. Since then, we have focused on areas in which to begin a series of changes that start from basic needs; safe and nutritious food, education, health for all. Teach villagers the skills to live in communities, share their resources and work in a group so that the village economy will robust and become self-reliant. Villages are basic units that decide the GDP of India as they are the providers of most of the nation's food supply.

We can witness profound transformation in the economy and communities of the village which contributes to the Indian economy and society at a micro level. Understanding the village at a micro level, take Naniborvai, as a basic unit of a population over 600 people can help understand the economy of a country at the macro level.

Keywords:

Agriculture, Health, Education, Poverty, Job Opportunities , Amrita SeRve ,Women Empowerment, Naniborvai, Amrita milk cooperative society, ,Group Farming, Self Reliant, regression

Methodology

Amrita SeRve has adopted a convergence method with an aim to integrate small and marginal farmers at Naniborvai into food systems, health systems, value chains, and markets. The issues addressed are framed by six main themes:

- Unorganized farmers are organized and started dairy & group farming,
- Convergence method helps to reduce the cost drastically,
- Bargaining power in the group significantly gets higher prices
- Maximum land under cultivation,
- Standardize Product Quality,
- Farmers selling their farm products at favourable prices

Amrita milk cooperative society-Naniborvai [AMCSN] was engaged in a variety of activities to provide its members with an assured market for their milk. It was registered under AMUL-SABAR Himatnagar Co-operative Societies in the year October 2018 with initially seventy-five members and capable of handling 980 liters of milk daily. The milk cooperative is managed by women SHG's and a sign of togetherness in need with the objective of economically and socially empowering women.

The contribution of women to the village economy in the current context and its potential is of greater significance. In Naniborvai having over 100% of the families are dependent on agriculture for their livelihood. Women play a critical and potentially transformative role in animal husbandry growth at Naniborvai and started an Amrita milk cooperative

society- Women plays a crucial role in livestock rearing and involved in activities such as feeding, cleaning and milking of dairy animals, care of young animals and significantly contributes to household income and village income. Women at Naniborvi village are capable to conduct weekly meetings which involve maintaining minutes register, bank account solving village disputes, organize the meeting, attend training knowledge about improved farm practices, dairy technology, and livestock management and look after their children and other members of the family in a better way.

Area of the study

The present study was carried out in Naniborvai Village, Ravalli District of Gujarat and selected seventy-five women from the village who are members of SHG Groups.

Methods of sampling

Selection of the respondents

The study sample consisted of 75 (N=75) farm women in the Village

Tools and techniques of data collection

The data were collected by personal interview technique through a structural schedule involving SHG women's from Naniborvai Village. Involved women in decision making regarding measured in all the categories. i.e. milking, collecting, transportation, lactation cycle noted, maintaining the register, feeding, taking care of buffaloes and buffalos at Naniborvai village.

Group Farming

After the success of AMCSN farmers organized and started the farmers group and registered under Agricultural Technology Management Agency [ATMA]. Seventy-five farmers form farmers group and doing group farming in 200 acres of land. Most of the farmers are marginal. Farmers are mainly doing mixed farming in groups.

Objectives of Group Farming

- Increase paddy cultivation and decrease expenditure.
- Market the produce collectively.
- Value-added to the produce.
- Reduced the production expenditure and increase the income.
- Jointly working with government departments using convergence method.

Depends upon Agriculture	Dairy Farming								
	Group	Total No of Animals (Y)	Average Milk(liter/day)	Income /Day	Expense		Net income	Average income/day/ Buffalo	Average income/Month/ Buffalo (X)
			4 Liter	55 Rs/liter	200 Rs/Day/ Buffalo	200		I/A	30
Depends upon both season (Rabi & Kharif Season)	I	140	560	30800	200	7000	23800	170	5100
Depends upon Rabi Season	II	75	300	16500	200	5000	11500	153.33	4600
landless and Agricultural labour	III	30	120	6600	200	3000	3600	120	3600
	Total	245	980						

Relationship between Income and No of household in Group

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Net income from Milk in Groups	Group	Total no of Buffalo in Group
5100	I	140
4600	II	75
3600	III	30

The independent variable is Net income from Milk in Groups. Net income from Milk in Groups, and the dependent variable is Total no of Buffalo in Groups. In order to compute the regression coefficients, the follow table needs to be use

Groups	Net income from Milk in Groups X	Total no of Buffalo in Group Y	Net income from Milk in Groups*Total no of Buffalo in Group X*Y	Net income from Milk in Groups x^2	Total no of Buffalo in Group y^2
Group II	5100	140	714000	26010000	19600
Group II	4600	75	345000	21160000	5625
Group III	3600	30	108000	12960000	900
Total	13300	245	1167000	60130000	26125

Based on the above table, the following is calculated:

--- n

$$X = 1/n \sum_{i=1}^n X_i = 13300/3 = 4433.3333333333$$

--- n

$$Y = 1/n \sum_{i=1}^n Y_i = 245/3 = 81.6666666667$$

$i=1$

$$\bar{X} = \frac{1}{n} \sum_{i=1}^n X_i = \frac{13300}{3} = 4433.3333333333$$

$$\bar{Y} = \frac{1}{n} \sum_{i=1}^n Y_i = \frac{245}{3} = 81.6666666667$$

$$SS_{XX} = \sum_{i=1}^n X_i^2 - \frac{1}{n} \left(\sum_{i=1}^n X_i \right)^2 = 60130000 - 13300^2/3 = 1166666.6666667$$

$$SS_{YY} = \sum_{i=1}^n Y_i^2 - \frac{1}{n} \left(\sum_{i=1}^n Y_i \right)^2 = 26125 - 245^2/3 = 6116.666666667$$

$$SS_{XY} = \sum_{i=1}^n X_i Y_i - \frac{1}{n} \left(\sum_{i=1}^n X_i \right) \left(\sum_{i=1}^n Y_i \right) = 1167000 - 13300 \times 245/3 = 80833.333333333$$

Therefore, based on the above calculations, the regression coefficients (the slope m , and the y-intercept n) are obtained as follows:

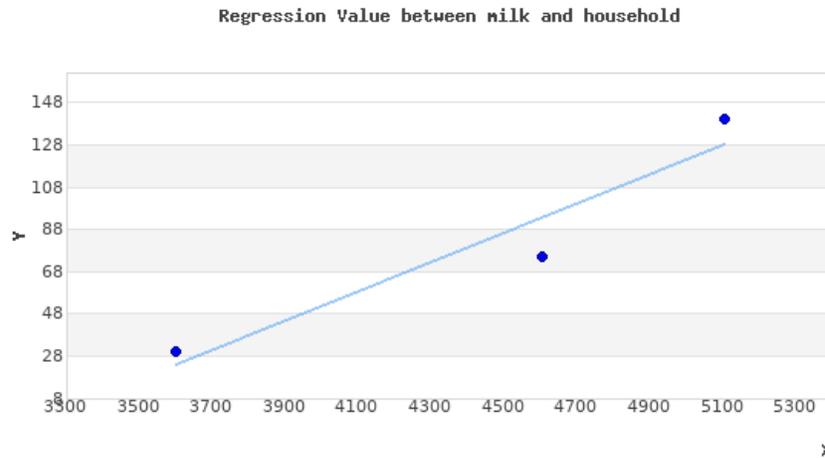
$$m = \frac{SS_{XY}}{SS_{XX}} = \frac{80833.333333333}{116666.666666667} = 0.693$$

$$n = \bar{Y} - \bar{X} \cdot m = 81.6666666667 - 4433.3333333333 \times 0.693 = -225.5$$

Therefore, we find that the regression equation is:

$$Y = -225.5 + 0.693X$$

Graphically:



Findings

The studies broadly fall into four strands of research.

- 1] The regression Line show that if number of buffalo increases the income of Groups also increases. i.e mean if income of household is directly proportional to number of buffalo
- 2] Assesses the impacts on women engaging in milk production.
- 3] Estimates employment generation in the village through dairy farming and agriculture.
- 4] Economy-wide impacts of the dairy sector on the village economy supplementing organic farming where income from dairy farming is consistent and while income from farming varies and subsequently both contributes to Village Economy.(i,e clear shift from linear to circular economy).

Impact of Dairy unit on Women Empowerment

It assures equal wages for men and women. By generating employment to women AMCSN has played a substantial role in economically empowering women and laying the basis of greater independence and self-esteem. Women are earning; gives them access to control over an independent income and education. The study shows a direct impact on women engaged in milk production and household welfare. The analysis showed that the interviewed farmers perceived organic farming as riskless and close to nature, especially given reasonable prices and positive consumer responses. Also, they expected organic farming to increase their autonomy, especially regarding feed, thus reducing all input costs by preparing fertilizer and pesticide in the village.

Opportunities

Milk Consumption & Nutrition.

As milk consumption increases total dietary composition of the family goes up. Family members consume more healthy milk products prepared at homes such as curd, ghee, cheese, and butter. The production of milk significantly improves the nutrition outcomes of children's in the village.

Natural and integrated farming system and Crop Yields

Integrated crop and livestock farming plays a major role in the farming system at Naniborvai village. Farmers were doing close to natural farming with limited external input. Farmers using fertilizer and pesticides made from animal manures and bring them further close to organic farming. Major Crops: Two hundred fifty acres of land were cultivated using organic manures.

In winter (rabi) season, vegetables, groundnuts, and rice were taken. Besides, some farmers also grew millets. In Kharif, farmers grow a variety of wheat. Apart from wheat and rice; bajri was grown mainly for food (but also provided fodder) and jowar was grown mainly as a fodder crop.

This integration of various forms of crops and animals ensure microorganisms grow and help to improve and maintain the biological fertility of the soil. Indigenous buffalos and buffalo's breeds are less susceptible to disease and stress and organic manure helped the soil by increasing its water holding capacity and improving soil aeration. Farmers prepared panchagvya, beejamrutha and jeevamrutha which not only cut down the costs but helps to improves soil health, balanced nutrition, control severe pest and disease and thus helps to double the crop yields. It also offers synergistic interactions between humans, animals, and soil.

Employment Generation.

Dairy units were the most important occupation besides agriculture and it created hundreds of direct and indirect jobs in villages and the money revolves in and around the village. Dairy buffalos or buffalo's ownership increases the demand for farm labour, which may be met by family members or by hiring labour from nearby villages. At the micro-level, it provides jobs to all the members in the village throughout the year. The dairy sector creates a substantial number of off- farm 'jobs', which create additional employment. It furthermore suggests that owners with more buffalos or buffalos, in addition, generates more employment also pay higher wages.

Demand for healthy food:

After COVID-19 people start looking back to nature. People are searching for food from local villages. The people living in urban areas are interested in organic products mainly to take care of their own health. This may well boost to organic foods and environment.

Grass or crop residue based feeding:

Most of the animals at Naniborvai feed grasses and straws. Limited practice of fodder production and animals generally consume naturally grown grasses and shrubs which are of low quality in terms of protein and available energy but farmers cultivates legumes which will improve the quality of feed and balance the food cycle. Nitrogen fixation is done by Legumes release high quality of organic matter and enhances soil nutrition's circulation and water retention.

Gross household income.

Increased availability of milk, as well as higher crop yields, may improve household nutrition as well as enhance incomes. Almost 95-100% of households engaged in dairying. The total numbers of animals were 350 buffaloes most of them are of the indigenous breed. 980 liters of milk were collected and billed per day at AMCSN. The rate for buffalo milk per liter is Rs 55. The average profit from milk for each family who is having one buffalo is Rs 3600. (Consistent income) and the average profit of farmers holding one acre of land is average Rs 60,000 to 80,000 Rs. So Annul profit for each family holding one-acre land and a buffalo is Rs One lakh/ Year. At the village (micro-level) people engaged in dairying were the cause rather than the result of higher household welfare which consistently improve the village economy.

Protecting and enhancing biodiversity

Organic farming is environmentally friendly and helps to bring back many microbes and slowly recovering from environmental degradation. Livestock in villages not only produce milk but manage and optimizes the recycling of nutrients. Dairy production also has significant social and environment impact.

Village Economy shift from Linear to |Circular Economy

It generates employment opportunities, helps in production improvement and encourages adoption of Nutri-cereal and climate-resilient crops. In economical aspect it's a clear shift from linear to circular economy. Usually Livestock production and agriculture are mainly linear in structure, but at Naniborvai village where farmers used input fertilizers and pesticides which enriches soils, microclimate and other relevant husbandry parameters. Farmers used local level of agricultural inputs at optimal level, thereby ensuring that the minimum resources needed are used at the production stage in order to achieve good production with minimal environmental impact. It directly contributing to 'Circular Economy', mixed farming addresses the use of minimal levels of invested resources that is essential to achieving sustainable agricultural production.

Conclusions

At micro level dairy units makes a significant contribution to poverty reduction, both at the household and community level. Dairying not only contributes to a regular source of food and income, but it puts farmers in a better position to feed their families, provide better education ,good health, and nutrition, and invest in their future. From this study, we have observed that small-scale dairy farming is increased confidence and self-esteem among women. Rural women

became more empowered when they have a regular job and seem they make a good decision in achieving social, economic and psychological growth. Villagers are basic units of development so planning for development starts at micro level. Dairying and natural farming are, complementary to each other and each village become Self Reliant. In addition, much economic activity in near-by towns (Vadagam) is closely interrelated to the surrounding village economy through consumption, production, employment and financial linkages, and various types of economic and social service provision. Or In other words village economy is directly proportional to small town economy.

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