Impact of NDP-I Interventions on Strengthening Women's Empowerment in India's Dairy Sector

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ABBREVIATIONS

AI	Artificial Insemination
ATT	Average Treatment Effect on Treated
BMC	Bulk Milk Coolers
BPL	Below Poverty Line
CMP	Clean Milk Productions
DCS	Dairy Cooperative Societies
EIA	End Implementing Agency
DID	Difference in Differences method
FD	Fodder Development
FGD	Focus Group Discussion
FOP	Farmer's Orientation Programme
GDP	Gross Domestic Product
GEM	Gender Empowerment Measure
Gen	General Caste
GPI	Gender Parity Index
HH	Households
IEC	Information, Education and Communication
ICT	Information and Communication Technology
INAPH	Information Network for Animal Productivity & Health
IDA	International Development Association
IV	Instrument Variable

LRP	Local Resource Person
MAIT	Mobile Artificial Insemination Technician
MCMT	Management Committee Member Training
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MPP	Milk Pooling Point
MT	Million Tones
NDDB	National Dairy Development Board
NDP	National Dairy Plan
OBC	Other Backward Castes
PF	Project Functionaries
PRI	Panchayati Raj Institutions
PS	Pedigree Selection
PSM	Propensity Score Matching
PT	Progeny Testing
RBP	Ration Balancing Program
RCT	Randomized Control Trial
RDD	Regression Discontinuity Design
SC	Scheduled Caste
SHG	Self Help Groups
SSS	Strengthening of Semen Station
ST	Scheduled Tribe
TOC	Theory of Change
VBMPS	Village Based Milk Procurement System

VAP	Village Awareness Program
WEAI	Women Empowerment in Agriculture Index
WEDI	Women Empowerment in Dairy Index
5DE	Five Domains of Empowerment

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EXECUTIVE SUMMARY

The Indian dairy sector has registered significant growth during the last four decades. India has the largest number of milch animals and is the largest milk producer in the world. Emerging trends indicate that milk demand is likely to reach 155 MT by 2016-17 and between 200-210 MT by 2021-22. The absolute volume growth in milk production in 2014-15 over the previous year is in excess of six million tones. National Dairy Plan (NDP) Phase I, is designed as scientifically planned multi-state initiative in order to increase productivity of milch animals through focused approach to breeding and feeding.

Dairy provides a secondary source of income to large number of marginal and medium sized farmers. Nearly 70 per cent of labor in the dairy sector is provided by women. Given this background, NDP-I has the potential to positively influence the socio-economic status of women in dairy households. The objective of this study is to conduct an interim evaluation of the impact of NDP-Ion women empowerment in dairy households. The study was conducted in six states: U.P., Punjab, Rajasthan, Gujarat, Karnataka, and Odisha. Household level survey data were gathered from 2423 households covering a total of 4846 respondents (two adult members from each household, one male and the other female). In addition, 48 case studies, 37 Focus Group Discussions (FGDs), and 129 interviews were conducted with End-Implementing Agencies (EIAs), project functionaries, village-level Dairy Cooperative Societies (DCS) functionaries, and project beneficiaries.

The household level data were analyzed using micro-econometric methods such as qualitative response models and propensity score matching method. The econometric results indicate that

NDP-I had a positive impact on women's participation in decisions related to selling milk. However, the program did not significantly influence women's participation in the use of dairy income as compared to women located in non-NDP areas. The most significant change was observed in the area of leadership. The program village women were found to be five per cent more likely to participate in village level infrastructure discussions. A typical woman in a program household is six per cent more likely to demand fair wages for public works and protest misbehavior by authorities and elected representatives. It is interesting to note that NDP-I has the potential to indirectly influence the efficacy of rights based programs such as MGNREGS.

NDP-I has helped women gain access to at least one of the three extension services (AI, veterinary, and nutrition service). To be precise, NDP women are eight per cent more likely to access one or the other extension services. Results indicate that the program has significantly improved the breadth of coverage of extension services; however, the frequency of use of the extensions services by women members remains an area of improvement.

The study also investigated the impact on gender parity at the household level. Impact estimates indicate that both Village Based Milk Procurement System (VBMPS) and Ration Balancing Program (RBP) sub-components positively contributed to gender parity. Households with educated females, individual bank accounts were the largest beneficiaries, while Below Poverty Line (BPL) households are still lagging behind on various dimensions of women empowerment. The program has positively influenced the public speaking opportunities for women. They are more likely to use extension services, devote additional time to improve quality of poured milk, and participate in milk selling decisions.

The study formulated a Women Empowerment in Dairy Index (WEDI). The value of index can lie between 0 and 1. Greater empowerment is indicated by larger values of the index. There was a statistically significant difference in WEDI between NDP and non-NDP households as a whole. Among individual EIAs, there was no significant difference in gender empowerment between NDP and non-NDP villages. Only in case of the EIA Paayas (a producer company), a significant difference in WEDI between NDP and non-NDP households was found. The highest WEDI was seen in the EIA Cuttack, Odisha at 0.87, while the lowest WEDI was seen in Maahi, Gujarat at 0.48. The WEDI based results should be interpreted carefully because the index computation process does not control for other critical factors that may also influence the index value.

1. Introduction

1.1 Background

India is one of the fastest growing economies in the world. Recent estimates show that it is the third largest economy, after US and China, in purchasing power parity terms[1]. Despite commendable macroeconomic growth over the last decade, the benefits of economic development haven't reached a major portion of the population. The Government of India's recently established NITI Aayog (National Institution for Transforming India) defines inclusive, equitable and sustainable development as its primary objective. In its seven guiding principles for think-tank, it included integrating villages into the development process, inclusion of the vulnerable and marginalized sections and sustainability at the core of the planning and development. The agriculture sector, on which more than half of the country's population depends as principal means of livelihood, has always been identified as a major area of focus for making growth more inclusive. The country is the largest producer, consumer and exporter of spices and related products in the world; and in export of farm and agriculture outputs, it is ranked fifth[2]. From dairy, processed, frozen food to fisheries, meat, poultry, and food grains; the Indian agriculture industry covers all the bases. The Agriculture and Allied sector (including agriculture, livestock, and forestry and fishery sub sectors) contributed 13.9 per cent to GDP in 2013-14 at 2004-05 prices. Also, agricultural exports constitute a fifth of the total exports of the country.

[1] World Development Indicators, The World Bank2014. http://data.worldbank.org/data-catalog/GDP-PPP-based-table

[2] http://www.financialexpress.com/article/fe-columnist/for-indias-trade-it-is-advantage-agriculture/150797/

The Indian dairy sector, which plays a crucial role in agriculture GDP, has experienced a significant growth during the last four decades. India's "White Revolution" is a phenomenon that is as celebrated as the green revolution in development literature. Today, the country accounts for more than 15 per cent of world's total milk production[3]. Production of milk has grown from 17 million tons (MT) in 1951 to 127.3 MT in 2012, 137.7 MT in 2013-14[4] and reached 146.3 MT in 2014-15. As per the Economic Survey Statistics of 2012-13, the per capita milk availability has increased from 176 grams per day in 1990-91 to 290 grams in 2011-12, which is comparable with the world per capita availability of milk at 289 grams per day in 2011. This has increased to 322 grams in 2014-15, India also has one of the largest livestock populations in the world. Out of 300 million cattle in India, about 127 million are adult breed-able females[5].

Apart from being world's largest milk producer, India is also the largest consumer base of dairy products in the world, consuming almost all of its own milk production. While the annual milk production is growing at 3.3 per cent, consumption is growing at 5 per cent leaving a gap between demand and supply[6]. This demand supply gap is due to the changing consumption habits, dynamic demographic patterns, and rapid urbanization of rural India. Emerging trends indicate that milk demand is likely to reach 155 MT by 2016-17 and between 200-210 MT by 2021-22[7]. Therefore annual milk production has to increase by 6 MT over the next 15 years in order to meet the domestic consumption growth. If India falls short of the required production

[3] http://dairy.ahdb.org.uk/market-information/supply-production/milk-production/world-milk-production/
[4] Department of Animal Husbandry, Dairying & Fisheries Ministry of Agriculture, Government of India Annual Report 2014-15
[5] National Dairy Development Board Annual Report 2010-11
[6]http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Dairy%20and%20Products%20Annual_New%20Delhi_India_10-15-2014.pdf
[7] . http://www.business-standard.com/article/economy-policy/estimated-milk-demand-by-2016-17-to-be-about-155-mn-tonnes-nddb-chairman-114082601068_1.html

growth, the country will have to depend on imports from the world market, which can potentially increase the international prices.

The quality of cattle is a critical factor in determining the milk productivity. Despite being the world's largest milk producer, India's milk productivity per animal is low. Average milk yield in case of cows is only about 3.4 kg/day against the world average of 6.3 kg/day[8.] Unlike other countries, buffalo milk accounts for over half the national milk production. Average milk yield per buffalo is about 4.6 kg/day. Less than 20 per cent of Indian cattle are cross-bred with relatively high milk yields. The low milk productivity is due to relatively less successful cattle and buffalo breeding programs, feeding practices that are not based on scientific feeding methods, poor nutrition, health, and near absence of well-run genetic improvement programs[9].

Approximately 70 million of 147 million rural households are engaged in dairying for their livelihoods. Unorganized sector handles around 70 per cent of the national milk volume. Of the remaining 30 per cent, dairy cooperative handle 16 per cent and large private processors handle 14 per cent milk volume. In order to address the mounting challenges in the dairy sector, a central sector scheme of National Dairy Plan (NDP) – I was launched for a period of 2011-12 to 2018-19. National Dairy Plan – I is implemented with a total investment of about rupees 2242 crore comprising 1584 crore as International Development Association (IDA) credit, 176 crore as Government of India share, 282 crore as share of End-Implementing Agencies (EIAs) that will

[8] http://www.worldbank.org/en/news/press-release/2012/04/13/project-signing-government-of-india-and-world-bank-sign-us-352-million-agreement-for-national-dairy-support-project
[9] http://www.fao.org/docrep/011/i0588e/I0588E05.html

carry out the projects in participating states and 200 crore by National Dairy Development Board and its subsidiaries for providing technical and implementation support to the project[10].

1.2 National Dairy Plan 1

National Dairy Plan – I, a central sector scheme, is designed as scientifically planned multi-state initiatives to increase milk production by increasing productivity through a focused approach to breeding and feeding. Two primary development objectives of this scheme are:

(1) To help increase productivity of milch animals and thereby increase milk production to meet the rapidly growing demand for milk.

(2) To help provide rural milk producers with greater access to the organized milk sector.

NDP-I is being implemented with a total investment of about 2242 crore, where the Government of India is partnering with several organizations including International Development Association (IDA) as credit partner, End Implementing Agencies (EIAs) and National Dairy Development Board (NDDB) and its subsidiaries. End Implementing Agencies include State Cooperative Dairy Federations, District Cooperative Milk Producer Unions, Producer Companies, Registered Societies/ Trusts, State Livestock Boards, Bull Production Farms and Semen Production Institutions. NDP-I focuses on 18 major milk producing states namely Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal, Telangana, Uttarakhand, Jharkhand and Chhattisgarh which together account for over 90% of the total milk production in India.

[10] 10.http://www.nddb.coop/ndpi/about/brief

Benefits of NDP-I will accrue to the country as a whole. The project components and sub-components under NDP-I are:

Table 1.1: NDP-I Components

Component A: Productivity Enhancement
• Artificial Insemination (AI) • Progeny Testing (PT) • Pedigree Selection (PS) • Strengthening of Semen Station (SSS) • Ration Balancing Program (RBP) • Fodder Development (FD)
Component B: Milk Collection and Bulking
• Expansion of existing and formation of new Dairy Cooperative Societies (DCS) • Promotion of new milk producer Institutions / New Generation Cooperatives • Village level infrastructure development (milk cans, coolers, weighting/testing machine) • Training & capacity building of milk producers & other functionaries
Component C: Project Management and Learning
• ICT Based MIS • Learning and Evaluation

1.3 What is this report about?

The Project management Unit, NDDB, has commissioned this study to assess whether the National Dairy Plan Phase I has improved women's inclusion and empowerment. The study also focuses on the following objectives:

(a) Implementation of Strategy: Assess the implementation of NDP-I interventions on women's participation (through formation of new Women Dairy Cooperative Societies, expanding women's membership in existing and new DCS; strengthening women's

participation in leadership roles as members of management committees and on boards of milk unions; inclusion of more women as field functionaries; participation of women in training and capacity building programs); provision of advisory services directly to women dairy farmers; and access to project services. Based on the above, assess the integration of gender strategies at farmer's level, functionary level and institutional level.

(b) Outcomes and Impacts: Assess the outcomes and impact of NDP-I strategies on social, financial and economic empowerment of women including decision-making processes at levels of household and institutions, project functionaries and institutions. Use the Women's Empowerment Index developed by IFPRI as applicable to dairy development.

(c) Stakeholder Perceptions: Assess perception of dairy institutions, project functionaries, PRI members and women farmers, about women's inclusion and empowerment as a result of project interventions, and issues and challenges.

(d) Gaps and Challenges: Based on the above, identify key gaps and challenges faced by women in accessing services, in participation in project interventions and institutional leadership, and recommend measures to address these challenges.

(e) Good Practices/Cases: Compile the evidence base of good practices that can inform implementation, and to carry forward design of gender-responsive interventions to the next phase of the program.

As India has been growing economically over the past two decades, gender inequality indicators continue to raise concerns. According to the 2014 Gender Inequality Index (GII) of the United Nations Development Program, India ranked at 127 out of 146 countries[11]. India's persistently dismal performance lags behind that of other countries in the region, including countries with

[11] http://www.in.undp.org/content/india/en/home/countryinfo/challenges.html

lower per capita gross domestic product (GDP) like Sri Lanka. Gender equality is important for sustainable economic development and empowering rural women is vital to food security and poverty reduction.

India is world's largest milk producers and the role of women in dairying is prominent. They look after most of the dairying activities such as, fodder collection, feeding, cleaning, milking, watering, management, health care, household level processing of milk and its marketing. Dairying has always been regarded as one of the activities that could contribute to poverty alleviation and employment generation, especially in drought-prone and rain-fed areas. Compared to other sectors, gender equity is more pronounced in livestock and animal husbandry sector where women constitute about 69 per cent of the workforce. The baseline survey of NDP-I has reported that of the total time spent on dairying, women's share is 64 per cent. To mainstream women in economic activities related to dairying and its governance, several measures have been taken by National Dairy Development Board (NDDB) for promoting women involvement in dairy cooperatives. National Dairy Development Board has encouraged involvement of women in leadership roles in dairy cooperatives. Women members have been encouraged to participate in management committees and on boards of milk unions and state federations. As of March 2013, the dairy cooperative network had 15.1 million farmer members, of which more than 4.3 million were women members. More than 0.32 million women are in leadership roles in the management committees of village-level dairy cooperative societies (DCS) and 354 represent on boards of milk unions and state federations. There are about 25,000 exclusive women dairy cooperatives societies in India. Two milk unions, Ichhamati Cooperative Milk Union in West Bengal and Mulukanoor Women's Mutually Aided Milk Producers

Cooperative Union in Andhra Pradesh have evolved as all women cooperative dairies managed and governed by women.

NDP-I program interventions are anticipated to reduce poverty and empower women in a number of ways. The 18 states participating in the program include a number of economically lagging states such as Uttar Pradesh, Orissa and Rajasthan. The transfer of primary knowledge like Artificial Insemination (AI) services and advice on ration balancing will benefit the dairy farmers. Under the National Dairy Plan Phase I, specific focus has been given to gender integration at all the three levels, i.e. farmer's level, functionary level and institutional level. The following steps are being taken for ensuring better inclusion of women:

- Promoting formation of new Women Dairy Cooperative Societies
- Improving enrolment of women members in existing and new Dairy Cooperative Societies
- Improving involvement of women in leadership roles as members of management committees and on boards of milk unions.
- Inclusion of more women as field functionaries
- Gender integration in all the training and capacity building programs
- Ensuring participation of women in capacity building programs
- Providing advisory services directly to women beneficiaries

This special focus will steer greater participation of women in governance of DCS and also as field functionaries in the dairy sector. The increased women involvement would facilitate their rise in leadership positions along with the increase in women-owned dairy assets. Gender

sensitization through training of milk producers, project functionaries, milk unions and provision of market access through organized sector (cooperatives, producer companies or private dairies) will improve inclusion and empowerment of women in dairying. The theory of change is presented below.

1.4 Program Theory: The Theory of Change (TOC)

Recent years have seen increased interest in using quantitative methods to measure the impact of development programs similar to NDP-I. Several research organizations and think tanks such as The Abdul Latif Jameel Poverty Action Lab (J-PAL), International Initiative for Impact Evaluation (3ie), etc., lay emphasis on impact evaluation studies to clearly lay out how it is that the intervention (inputs) is expected to affect final outcomes (that is, women empowerment). The approach why a program has, or had not had, an impact is called Theory-Based Impact Evaluation (TBIE). This approach examines the assumptions underlying the causal chain from inputs to outcomes and impacts. The causal chain embodying the program theory (or theory of change) as to how the intervention is expected to have its intended impact is embedded in the logical framework known by its short form log frame. It is possible that some program assumptions appear as ‘risks’.

NDP-I Project Implementation Plan document, table 3.3 on page 52, presents a risk and risk mitigation matrix for NDP-I. Broadly, ten risks associated with NDP-I project components and sub-components, their anticipated strengths, and risk mitigation measures have been briefly outlined. The same table has been reproduced below:

Table 1.2: Risk Identification and Mitigation Matrix for NDP-I

Risks	Rating
Outbreak of foot and mouth disease with PT/PS program is implemented, may reduce the procurement of bull calves	High
EIAs adhering to SOPs may face resistance to ear tagging of females and calves born	Medium
Lower production of high quality disease free semen	Substantial
Lack of trained AI technicians may hinder target achievement	Medium
AI technicians fail to capture and transmit achieved AIs and pregnancy diagnosis as per INAPH specifications	Medium
Farmers delay in accepting the Local Resource Persons (LRPs) advice with respect to feeding a balanced ration	High
Unavailability of LRP advised feed supplements	Medium
Inadequate availability of foundation certified fodder seeds	Medium
Animals not getting used to silage feeding	High
VBMPS members claiming membership rights without fulfilling membership responsibilities which may affect achievement of targeted procurement	Substantial
Impact on the community health	Medium
Land requirement for NDP activities can affect livelihood opportunities for land owners	Low
Increased water requirement due to genetic improvement of dairy animals	Medium
Methane emission from dairying	Substantial

Source: NDP-I Project Implementation Plan document, Table 3.3 on page 52

It is difficult for any project document to make explicit all the program assumptions. National Dairy Plan - I implementation document mentions that the listing of risks is not necessarily comprehensive since more risks may get identified in the course of the project implementation.

Hence, our next step was to run the program theory through the NDP-I program managers, namely the program coordinators working for the EIAs.

In the inception report, a general program theory was proposed, which was based on the examination of program documents, interaction with Central Monitoring Cell (CMC) officials of NDDB during the project immersion event, a field scoping visit to the Panchmahal Milk Union and interaction with project functionaries and household level beneficiaries from several program villages located in the districts of Godhra and Dahod. Table 1.3 outlines the theory of change/program theory.

Table 1.3: Logical Framework and the Theory of Change: Impact of NDP-I on Women Empowerment

Inputs	Activities	Target Outputs/Output Indicators	Outcomes*
INR 2041 crore	Artificial Insemination/ Progeny Testing/Pedigree Selection	About 4 million doorstep AIs, Induction of 3,000 private mobile AI technicians, Preparation of 2,500 HGM bulls	Productivity enhancement
	Strengthening of Semen station	Additional 51 million disease free semen doses produced annually	Productivity enhancement
	Ration Balancing Program	2.7 million milch animals covered across 40,000 villages using 40,000 LRPs	Increased milk production, Reduction of production cost, Improvement in knowledge of dairy feed nutrition and practices for women, Integrated

Inputs	Activities	Target Outputs/Output Indicators	Outcomes*
			livelihood opportunities for LRPs
	Fodder Development	Production of 7500 tonnes of certified fodder seed, Training for conservation of green fodder (silage)	Increase in productivity per unit of fodder crop area, Round the year availability of fodder
	Formation of new DCS and expansion of existing DCS	About 1.2 million new farmers pouring milk in village based milk producers' institutions , 23800 villages covered under milk procurement system	Increased access to organized milk-processing sector, Increased access to credit and autonomy
	Formation of new women DCS	33% of all new DCS members to be women, Increase in number of women in DCS/District Union leadership positions	Greater participation of women in local governance/DCS/Union, Greater participation as field functionaries in dairy, Increase in women- owned dairy assets, Rise in women's participation in household decision-making
	Training of milk producers, project functionaries, milk unions, LRPs	Trained milk producers, especially women dairy farmers and project functionaries,	Improved appreciation of dairy business by farmers, Capacity enhancement of women milk producers

Inputs	Activities	Target Outputs/Output Indicators	Outcomes*
Assumptions: 1. Women participation in village level milk procurement bodies increases their participation in: (a) household decision making, and (b) decision making at village level. 2. The NDP-I activities are gender inclusive by design. 3. Social structures that prevent certain outcomes, for instance women entrepreneurship, are nullified to a great extent. 4. Strategy adopted by NDP-I intervention and other state level interventions to empower women are in sync with each other. 5. Extension services provided through the program are effective.			

*Note: Output indicators and outcomes do not have strict one to one correspondence

In the next section, we provide an overview of the existing research on the aspects of women empowerment.

2. Literature Overview on Women Empowerment

2.1 General

Dairying is an important livelihood activity for small and marginal farmers of the country. About 70 million rural households are engaged in milk production. A large proportion of this figure is small and marginal farmer and landless farmers who earn additional source of income from dairying. Dairying is mostly done by women in India who provide the largest amount of labor in dairying and animal husbandry activities. One study estimates this labor at 93 per cent (Sen and Rani, 1990). Some scholars argue about the hidden costs of dairying in form of increased workload of women (Sharma and Vanjani 1993). While some other scholars also see dairying as an opportunity for women to improve their economic and social status (Somjee and Somjee, 1989). Despite their greater role in dairying activities, they do not exercise commensurate control over village or district level milk organizations. Are women engaged in dairying better off than their peers not doing dairying? Unfortunately, no scientific longitudinal study exists to find out the real impact of dairying on women empowerment (Kumar, 1997). Much of the evidences are anecdotal and descriptive. Our literature search did not show any research published in reputed scientific journals on women empowerment in dairying. An average woman in India is disempowered in absolute as well as relative terms to men, which has not changed over time (Kishor and Gupta, 2004). Women generally invest in safer projects rather than uncertain ones, which enables women to use them as bargaining chip to improve their position in the household (Basu, 2006). Dairying provides them additional source of livelihood and is a source of stable income, which ideally should empower them.

2.2 Empowerment on Economic versus Social Indicators

Microfinance dominates the academic research and development practice as the program of women empowerment (Hunt and Kasynathan, 2001). It has been believed that improving access to credit will empower women. However, improving access to credit and income does not necessarily lead to control over assets or greater say in decision making (Endeley, 2001). A nuanced and differentiated approach is required because what works for less poor women does not work for very poor women (Buvinić & Furst-Nichols, 2014). In Indian scenario, Basu (2006) finds that microfinance has played important role in raising the level of women empowerment. Women's access to and control over their savings, credit and income have also improved. At the same time, women's freedom to move and interact with outsiders has also increased (Galab and Rao, 2003). Microfinance can reduce poverty for women (Khandker, 2005), bring about economic productivity and social well being of poor women and their households; but it cannot automatically empower women (Kabeer, 2005).

Interventions targeting poverty reduction and improved market linkages have not provided overwhelming evidences of their impact on women empowerment (e.g., Basu, 2006; Blattman et al., 2013). While these interventions seem to improve economic indicators, they do not seem to affect social indicators. Blattman et al. (2013) study was based on Randomized Control Trial (RCT) whereby $150 along with basic skills training were provided to 1800 poorest and most excluded young women in the age group of 14 and 30 in war affected areas of Northern Uganda to assess the impact on sustained livelihoods, reduction in poverty, empowerment, gender-based violence, family education and health, and psychological and social well being. The study found drastic reduction in poverty as monthly cash earnings of the treatment group doubled compared

to the controlled group. However, the reduced poverty and greater market access did not free women from the subjugated social status and intimate partner violence. Similarly, Basu (2006) finds that only 5% of women have autonomous control over the money loaned for income-generating activities. This is because of the patriarchal values, social and religious norms, perceptions and practices limit the role a woman can play (Chhay, 2011; Chaudhuri, 2010). As a result, microfinance programs, beyond a point, are incapable of improving overall quality of life of women (Chhay, 2011).

Dohmwirth (2014) finds evidence of economic benefits for women participating in dairy cooperatives. This is, however, not true for women empowerment benefits. The finding implies that economic benefits do not always lead to overall empowerment benefits. Interestingly, the study found that women-only milk cooperative members were less empowered compared to women in mixed-gender cooperatives. Women in mixed-gender cooperatives exercised greater decision-making power compared to women in single-gender cooperatives.

2.3 Other Factors Influencing Women Empowerment

Group membership is found to be strongly related to women empowerment (Amin et al., 1998). Other factors such as, higher socio-economic status, region, and nonagricultural occupation also explains women's empowerment (Amin et al., 1998). Women also need better access to quality education (Gallaway and Bernasek, 2004), training (Groh et al., 2012), economic and socio-political participation (Habib and Jubb, 2012), favorable labor laws, inheritance, and property rights for continuity in women's empowerment (Chaudhuri, 2010; Hallward-Driemeier & Gajigo, 2015). For example, the new family law 2000 in Ethiopia effectively improved the

bargaining power of women by increasing their voice and exit within the household. This law also increased the legal marriage age for women from 15 to 18 which enhanced their share in non-home occupations in Ethiopia (Hallward-Driemeier & Gajigo, 2015). Feminist movements in Philippines, government programs in Vietnam, and NGOs in Bangladesh have contributed to the cause of women's empowerment (Chaudhuri, 2010). Duflo (2012) calls for continuous policy action and commitment to equality between men and women. In India, the mandatory reservation for women in local government has enhanced the cause of women empowerment (Lindberg et al., 2011), while MGNREGS has led to empowerment of rural women as an unintended consequence (Pankaj and Tankha, 2010).

2.4 Outcomes of Women Empowerment

Women empowerment is linked to better anthropometric outcomes in mothers and children (Sethuraman, 2008; Suneetha et al., 2013) and possibly lower fertility rate in some countries (Upadhyay and Karasek, 2012). Women empowerment can also build social capital having far-reaching effects on the wider community (Jansenns, 2010). Many a time, spill-over effects or externalities of women empowerment are ignored, which result in under-estimation of the effectiveness of women empowerment interventions (Jansenns, 2010). Women empowerment in agriculture reduces food insecurity (Sharaunga et al., 2015). The study finds that physical assets that could generate non-farm income and agricultural production capacity of households also helps fight food insecurity. Women in agriculture can be empowered through crop management and animal husbandry skills (Sharaunga et al., 2015). National Dairy Plan – I is important in this context because it helps generate non-farm income through dairying and improves animal husbandry skills. National Dairy Plan - I could reduce food insecurity of the poor farmers.

2.5 Measurement of Women Empowerment

It is imperative that donors and implementing agencies ensure adequate support to the cause of women empowerment in program design and monitoring (Hunt and Kasynathan, 2001). However, defining women empowerment is challenging (Gupta and Yesudian, 2006; Mason, 1986). Many researchers have variously conceptualized and defined women empowerment (Malhotra et al., 2002). For example, it is defined as "the process, and the outcome of the process, by which women gain greater control over material and intellectual resources, and challenge the ideology of patriarchy and the gender-based discrimination against women in all the institutions and structures of society" (Batliwala, 1995). Kabeer (2001) defines empowerment as “the expansion in people’s ability to make strategic life choices in a context where this ability was previously denied to them.” World Bank’s empowerment sourcebook (Narayan 2002) defines empowerment as “the expansion of freedom of choice and action to shape one’s life”. Chadhuri (2010) measures women empowerment as economic participation, educational attainment, wage work, fertility, female to male sex ratio of living children, and the ideal female to male sex ratio. Whereas, Amin et al. (1998) split women empowerment into 3 sub-indices: inter-spouse consultation index, individual autonomy index and authority index. Galab and Rao (2003) refer to Murthy et al.’s (2002) three dimensions of women empowerment: 'power to', 'power with' and 'power within', which are described in Oxaal and Baden’s (1997). Murthy et al., (2002, p. 1274) describe, “The 'power to' dimension of empowerment indicates the power of women to control their lives. This includes power to survive, control over their labour and access to family labour, access to and control over resources, freedom to move and interact, access to leadership positions, control over reproduction and control over body. The 'power with' indicates the collective power of women members to negotiate their gender, caste, class and other interests

vis-a-vis institutions of the market, the state, and the community. This includes collective interventions in the institution of family, community, market organization, the state including statutory local bodies. The third dimension 'power within' indicates the strategic gender awareness. An indicator of the 'power within' at the individual level is the ability of women to challenge gender related attitudes and social norms in their own personal lives." Gupta and Yesudian (2006) measure women empowerment by four sub-indices: Household autonomy index, mobility index, attitude towards gender index, and attitude towards domestic violence index. They found that age, level of education, media exposure, and household standard of living to be the best predictors of women empowerment. There has been an attempt to localize measurement of women empowerment. National Dairy Development Board (NDDB) commissioned a study (2001) to develop a scale for measuring rural women's empowerment in dairying in India. They define empowerment as, "a process which begins with a self realization of women's own potential which enables her to effectively communicate her views and opinions to other women and the community at large. She uses her views and opportunities and access to resources to gain control over her environment. She thus creates a space for herself within her community or in society, which she uses to take and make decisions individually and also be an active participant in collective decisions". This study adapted Caves (1996) scale based on qualitative insights gained from the field to measure women empowerment. The scale captures information on the following dimensions: participation in economic activity, control over income, mobility, assertive communication, participation in social activity, gender equality, and social status. Santillán et al. (2004) develops indicators of women empowerment specific to Vietnam. Similarly, CARE USA implemented Women's Empowerment Impact Measurement Initiative (WEIMI) to measure women empowerment (Karim et al., 2014).

In context of agriculture, Alkire et al. (2013) developed Women's Empowerment in Agriculture Index (WEAI), which is a survey-based index comprising two sub-indices, to measure the empowerment, agency, and inclusion of women in the agricultural sector. This was developed as a tool to reflect women's empowerment and to assess the empowerment and gender parity in agriculture. It is a comprehensive index that assesses women's engagement in agriculture in five areas: decisions about agricultural production, access to and decision-making power about productive resources, control of use of income, leadership in the community, and time allocation. The other sub-index measures *gender parity* – women's empowerment relative to men within their households (reflecting per cent of women who are equally empowered as the men in their households) showing the empowerment gap that needs to be closed for women to reach the same level of empowerment as men. It has been used in several developing countries including Bangladesh, Guatemala, and Uganda. This study uses WEAI to measure Women's Empowerment. Review of the past literature helped identify explanatory factors as well as control variables for the econometric model used in this study.

3. Methodology

3.1 Sampling Plan

A multi-stage purposive sampling plan was followed for the household survey. The National Dairy Plan – I is implemented in 18 major states with potential to enhance milk production. These states together contribute about 90 per cent of total milk production in India. A weighted average index was developed to identify six states for data collection using the following criteria:

1. The first criterion was state's share in total milk production in India. The states were sub-divided in three categories – high, medium and low – based on their share in total milk production in India. States with less than 4 per cent share were ranked low, 5 to 7 per cent of share were ranked medium, and greater than 8 per cent were ranked high. This indicator was given 33 per cent weigh in the index.

2. The second criterion was number of EIAs with Village Based Milk Procurement System (VBMPS) projects for each state. This criterion was informed by the theory of change. Village Based Milk Procurement System intervention is expected to contribute most significantly to women empowerment as it will enable women's participation in production and sale of milk via DCS/Producer companies. This criterion was assigned 33 percent weight.

3. Finally, Gender Empowerment Measure (GEM 2006) scores were used for each state and assigned 34 percent weight. Gender Empowerment Measure is a measure of inequalities between men's and women's opportunities in a country. It combines inequalities in three areas: political participation and decision making, economic participation and decision making, and power over economic resources.

The final ranking of the states was based on the index score. These states were then categorized into four geographical zones: North, South, East and West. One state was selected from each South and West zones and two states each from North and West zones. The states with no VBMPS project initiated in 2012-13 were not selected in the final list because it would take more than a year for the empowerment impacts to become visible and measurable at the household level. Gujarat was purposively selected after preparing this index from the west zone because of its importance in the cooperative dairy movement and existence of a milk producers' company Maahi. Between Uttar Pradesh and Bihar, the former was selected because of its highest share (18 per cent) in the national milk production. The final list of the six states was: Gujarat, Rajasthan, Punjab, Uttar Pradesh, Odisha and Karnataka. Please refer to Annexure 1 for an overview of the sampling process and Annexure 2 for state selection scores and details.

The next stage in the sampling process was EIA selection from the six states. For each state, EIAs having approved VBMPS projects since 2012-13 were identified. However, exception wase made for the producer companies where VBMPS projects were approved in 2013-14. In Karnataka where more than two EIAs met the criteria, final selection was done on the basis of the number of proposed women DCS. Two EIAs, Banas and Kolar Milk Unions, were selected to give better representation to sub projects other than VBMPS. Annexure 3 provides the selection details of 10 EIAs.

The next stage of the multi-stage purposive sampling process was village selection. A total of 100 villages, 10 per EIA were randomly selected from the list made available by NDDB. Of the 10 villages per EIA, five villages were randomly selected as *program villages* where VBMPS

had already been rolled out and the remaining five villages were randomly selected as *control villages* where VBMPS program will be rolled out during 2015-17. The final list of program and control villages was discussed and verified with the EIAs.

The sampling unit was household, which was selected using the following three criteria: (i) five or less number of milch animals, (ii) presence of adult male-female members at the time of data collection, and (iii) household actively selling milk. Data from 24 such households in each of the selected villages were collected. See table 3.1 for an overview of the selected States, EIAs, districts, villages and households.

Table 3.1: Overview of Selected States, EIAs, Districts, Villages and Households

Selected States	**Selected EIAs**	**Selected Districts**	**Selected Villages**	**Selected Households**
Gujarat	Banas	Banaskantha	10	240
	Mahi Producer Cooperative	Bhavnagar	10	240
Rajasthan	Bhilwara	Bhilwara	10	240
	Paayas Producer Cooperative	Jaipur	10	240
Punjab	Ropar	Ropar	10	240
	Ludhiana	Ludhiana	10	240
Uttar Pradesh	Lucknow	Lucknow	10	240
Odisha	Cuttack	Jagatsinghpur	10	240
Karnataka	Kolar	Kolar	10	240
	Mandya	Mandya	10	240

In all, data from 2423 households (4846 adult male-female respondents) residing in 100 villages in 10 districts of 10 EIAs across six states were collected. In addition, qualitative information using focused group discussion and in-depth interview techniques was also collected. Table 3.2 below provides an overview of the data collected.

Table 3.2: Data Collection

Data	Target	Actual
HH Survey	2400	2423 HHs (2423 male and 2423 female)
Project Functionary Survey	100	71 (36 field functionaries + 35 EIAs officials)
DCS Survey	50	48
Case study	50	48
FGD	25	37

The household data were analyzed using descriptive statistics, regression analyses, and propensity score matching technique. The qualitative data were transcribed and analyzed using computer aided qualitative data analysis approach.

3.2 Women's Empowerment in Dairy Index

The Women's Empowerment in Dairy Index (WEDI) is derived from the Women's Empowerment in Agriculture Index. It is composed of two sub-indices: one measures the five domains of empowerment for women, and the other measures gender parity in empowerment within the household. It is based on individual-level data on men and women within the same households. The following five domains of empowerment (5DE) measure women's empowerment in dairy: production, resources, income, leadership, and work leisure. Scores on

these domains reflect the extent to which women are empowered in these domains. Difference between man's and woman's score shows gender gap in the household. These domains and calculation of scores on them are described below.

Production: This dimension concerns decisions about dairy production and refers to input in decision-making about selling milk, cultivation of fodder crops, buying of animal feed, availing vaccination and veterinary services, and decision whether to adopt artificial insemination technology. The answer scale for the questions regarding input in decision-making was 1 = very low, 2 = low, 3 = medium, 4 = high, and 5 = very high. For each activity, an individual was considered adequate, if the respondent makes the decision, or if the respondent feels that he or she could participate in the decision making to the *low* extent. All sub-indicators were then aggregated to form the indicator "input in productive decisions". The respondent was considered adequate on input in productive decisions, if he or she was considered adequate in at least two of the sub-indicators. In other words, the individual was considered adequate if there were at least two types of production related decisions in which he or she had at least *low* input in decision making.

Resources: This dimension concerns ownership of, access to and decision-making power over selling and buying of productive resources such as milk, milch animal, credit and dairy extension services. Access to credit included sources like NGO's, formal and informal money lender, and friends and relatives. Under dairy extension services, respondents were asked about the use of veterinary, artificial insemination and nutrition advisory services in past 12 months. The ownership indicator examined whether an individual had sole or joint ownership of milch

animals and milk produced. A person was considered adequate in this area, if he or she reported having sole or joint ownership. For access to credit and dairy extension services, respondent was considered adequate, if he or she had accessed any one of the services in last 12 months.

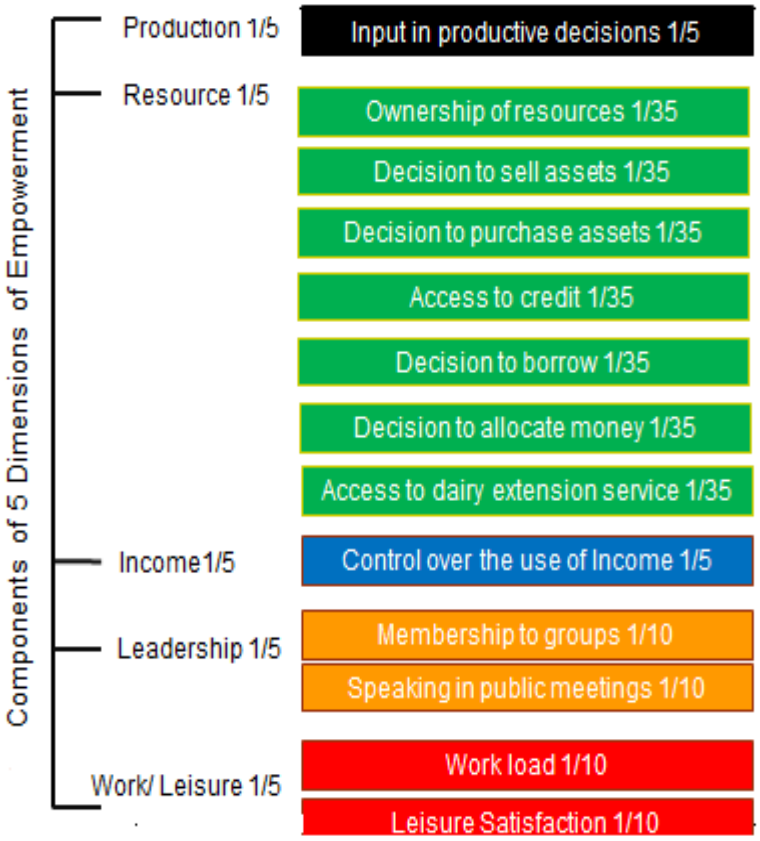
Income: This dimension captures say over the use of income generated from sale of milk and of milch cattle. If an individual had participated in the activity, how much say did the individual have in decisions related to the use of income generated from the sale of milk and milch cattle. The answer scale for the question regarding input in decisions was: 1 = none, 2 = low, 3 = moderate, 4 = high, and 5 = full. The individual was considered adequate on input in decisions about the use of income, if he or she had at least some input into decisions related to that activity.

Leadership: This dimension concerns leadership in the community measured by membership in economic or social groups, and comfort in speaking in public. Recognizing the value of social capital as a resource, this shows whether the person is an active member of at least one group, including (a) agriculture/ livestock/ milk producers' or marketing groups, (b) water users' groups, (c) forest users' groups, (d) credit or microfinance groups, (e) Panchayat, or (f) any other specific group. Group membership was not restricted to formal agriculture-related groups because other types of civic or social groups provide important sources of networks and social capital that are empowering in themselves and may also be an important source of dairy information or inputs. The indicator of whether the person was comfortable speaking in public was constructed based on responses to questions regarding the person's ease in speaking in public for the following: (a) decision with regard to infrastructure development such as small wells, roads, (b) ensuring appropriate payment of wages for public work or other similar

programs, (c) raising voice against delinquency of authorities or elected officials, and (d) speaking against the malpractices of local 'Dudhia'/cooperative dairy or other milk buyers in the village. The respondent was considered adequate in speaking in public, if he or she was comfortable expressing opinions in public for at least one of the four reasons listed above.

Work/ Leisure: The time allocation domain includes two indicators: workload and leisure. The first refers to the allocation of time to everyday dairying tasks; the second captures the individual's satisfaction with the time available for leisure activities. The definition of work-related tasks includes cleaning cattle shed, cleaning/caring of animals, collect/prepare fodder, feeding animals, milking animals, pouring milk, grazing cattle, fetching water for cattle, and cleaning of milk vessels. The individual is defined as adequate on workload if the number of hours he or she worked per day was between eight to 12 hours. Respondents were asked to rank their level of satisfaction with the time available for leisure activities such as visiting neighbors, watching TV, listening to radio, watching movies, or participating in sports from 1 = not satisfied to 6 = very satisfied. The indicator "leisure time" considered the respondent adequate if he or she ranked his or her level of satisfaction equal to or higher than 3, which meant he or she was either satisfied with or indifferent to the time available for leisure.

Figure 3.1: Components of 5DE



The sub-index 5DE are calculated as follows:

$5DE = H_e + H_n (A_a)$

H_e = percentage of women who are empowered

H_n = percentage of women who are not empowered $(1-H_e)$

A_a = adequate empowerment percentage of non-empowered women.

For the women who are disempowered, A_a shows the percentage of domains in which they meet the required threshold and thus experience sufficiency or adequacy.

The advantage of this construction is that it allows us to identify the critical indicators of the five domains that must be addressed to increase empowerment. This enables decision makers to focus on the situation of disempowered.

In this study, the disempowerment cut-off of 20 per cent has been contemplated, similar to what is considered in the Alkire et al (2013) WEAI construction. An individual is disempowered if his or her inadequacy score is greater than 20 per cent. This is similar to saying that an individual is identified as empowered on 5DE, if he or she has adequate achievements in four of the five domains, enjoys adequacy in some combination of the weighted indicators that sum up to 80 per cent or more, or has an adequacy score of 80 or greater.

The 5DE score can thus be improved by increasing the percentage of empowered women, or for those women who are not yet empowered, by increasing their adequacy scores.

3.3 The Gender Parity Index

The Gender Parity Index (GPI) is a relative inequality measure that reflects the inequality in 5DE between the primary adult male and female in each household. Households are considered to lack parity if the female is not empowered and her censored inadequacy is higher than the censored inadequacy score of her male counterpart. Put differently, a household enjoys parity if the woman is empowered; or if she is not empowered, her adequacy score is greater than or equal to that of the male in the household.

$GPI = 1- H_w (R_p)$

H_p = percentage of women with gender parity

H_w = percentage of women without gender parity

R_p = the average empowerment gap between women compared to the men in their Household

The GPI score can thus be improved by increasing the percentage of women who have gender parity (reducing H_w), or for those women who are less empowered than men, by reducing the empowerment gap between the male and female of the same household (reducing R_p).

3.4 Qualitative data analysis

Qualitative data has been used to understand the effectiveness of the project strategies, stakeholders' perceptions and qualitative aspects of the impact of the intervention. The qualitative data have been collected through in-depth semi-structured interviews, FGDs, and informal discussions. Relevant data from DCS and project functionaries have also been collected using brief survey questionnaires. Information gathered through the semi-structured interviews and FGDs helped in relating individual stories of the beneficiaries to the relevant program intervention. These individual stories have been compiled and analyzed to understand the patterns of the impact of the program. Content Analysis, Narration and Computer Aided Qualitative Data Analysis Software programs have been used to code and analyze the qualitative information.

3.5 Quantitative data analysis

Quantitative data have been used to understand the effectiveness of the project strategies, stakeholders' perceptions and quantitative aspects of the impact of the intervention. Quasi-experimental technique was used to quantitatively analyze the impact of the NDP interventions. This design consists of constructing a comparison group using matching technique. Matching involves identifying non–program participants comparable in essential characteristics to program participants. Both groups should be matched on the basis of either a few observed

characteristics or a number of them that are known or believed to influence program outcomes so that both groups are not systematically different from each other.

4. Descriptive Statistics

Women's empowerment has been defined as the process of acquiring the ability to make strategic choices (Kabeer, 1999). This includes three dimensions: resources (access), agency (decision making) and achievements (wellbeing outcomes). The WEDI index is largely an index of agency and achievements. It includes the ability to make decisions with regard to resources and wellbeing outcomes measured by participation in DSC meetings, speaking out in public and membership in member-based organization. This chapter describes various characteristics of the household that define access to resources. Agency and wellbeing outcomes are defined or are influenced by the access to resources or merely the household's ability to garner resources. We place various indicators of resources, physical and human capital, in conjunction with the WEDI by EIAs to see if there is any match or possible relation between them. This is a exploratory exercise to better understand the structure of the households and the character of women's agency and achievements. More sophisticated methods of attributing causation at the household level are used in the later chapters.

4.1 Household Physical Capital Resources

Access to household physical capital resources and income are presented by EIAs in Table 4.1. Ludhiana and Ropar in Punjab and Banas in Gujarat stand out to be richer households with larger land holdings, higher total income of the household. The households in these EIAs have four milch animals on average. End-Implementing Agencies in Karnataka, i.e. Komul and Manmul, Cuttack in Orissa and Lucknow in UP had the lowest mean land owned and total incomes. These EIAs also had lower mean number of milch cattle and a greater percentage of household owning

two or less cattle. However, NDP households had more milch cattle on an average than non-NDP households. The middle income and resource EIAs are two producer companies, Maahi and Paayas, and Bhilwara Milk Union. On an average, households in two producer companies, Maahi and Paayas, and Bhilwara Milk Union have middle-level of income, land ownership, and between 2 to 3 milch cattle.

Table 4.1: Household Physical Capital Resources

EIA	Mean Land Owned (Bigha)	Average Monthly Income (Rs.)	Average Number of Milch Cattle	Percentage of HHs owning respective number of Milch Cattle (%)					
				1	2	3	4	5	6
Banas	7.6	20485	3.7	5	18	18	24	35	0
Maahi	12.1	11798	2.8	14	32	27	11	15	0
Komul	2.9	7157	1.8	43	44	9	4	1	0
Manmul	4.0	5790	1.5	57	36	5	1	1	0
Cuttack	1.7	9406	2.2	25	46	16	9	4	0
Ludhiana	16.9	37982	3.5	9	20	22	18	29	2
Ropar	14.3	16900	3.1	12	26	20	23	17	2
Paayas	7.4	10320	2.8	19	30	17	18	16	0
Bhilwara	7.7	12570	2.3	27	38	18	12	5	0
Lucknow	3.9	7000	1.9	44	37	10	6	2	0

1. NDP HHs have more milch cattle compared to Non NDP

4.2 Social and Economic Status of Household

Dairy in general is a secondary source of income for households in all EIAs (Table 4.2). Maximum of 38 per cent of HHs in Banas in Gujarat and 28 per cent in Pyaas in Rajasthan had dairy as main source of income.

The caste distribution of the households showed that the richer households in Punjab's EIAs belonged to upper caste general category. Banas and Maahi showed richer households belonging to the Other Backward Castes (OBC) households. Households in Karnataka, though relatively poorer, largely belonged to the general category, while Cuttack had a predominance of OBC households. The EIAs with majority of middle income households, i.e. Maahi, Paayas and Bhilwara, also belonged to the OBC category.

The richer households in Punjab's EIA were least likely to be BPL card holders. The households in Karnataka's EIA were poorer and also were nearly fully BPL card holders. The next highest percentage of BPL card holder households was in Cuttack, little more than half. Among middle income households comprised EIAs, Maahi had 42 per cent, Cuttack 55 per cent and Lucknow 38 per cent BPL card holder households.

Table 4.2: Source of Household Income, Social and Economic Status

EIA	Dairy as main source of Income (%)	Caste Distribution (Percentage)				Percentage of BPL Card holders
		Gen	SC	ST	OBC	
Banas	39	13	2	0	85	22
Maahi	6	11	3	0	86	42
Komul	6	69	13	6	12	99
Manmul	1	78	1	1	20	99
Cuttack	7	13	7	0	80	55
Ludhiana	4	94	3	0	2	4
Ropar	8	90	6	0	4	7
Paayas	28	10	9	3	78	13

EIA	Dairy as main source of Income (%)	Caste Distribution (Percentage)				Percentage of BPL Card holders
		Gen	SC	ST	OBC	
Bhilwara	7	32	3	5	60	15
Lucknow	8	29	30	1	41	38

4.3 Household Infrastructure

The stark poverty of the households in Cuttack is indicated by the fact that more than half lived in fully kuchcha households (Table 4.3). This was followed by the middle income EIAs, Paayas, Bhilwara and to a lesser extent Maahi. As Punjab is identified as rich state, its EIAs hardly had any households which were fully kuchcha. There was not much difference in the availability of electricity across EIAs. The households in Bhilwara, Paayas, and Lucknow had the least access to drinking water.

Table 4.3: Household Infrastructure (in percentage)

EIA	Fully Kachcha HHs	HHs with Electricity facility	HHs with Drinking Water facility
Banas	10	91	97
Maahi	13	100	90
Komul	9	97	90
Manmul	12	98	92
Cuttack	52	100	95
Ludhiana	5	92	92
Ropar	5	95	95
Paayas	25	97	48
Bhilwara	29	99	31

Lucknow	12	85	39

4.4 Human Capital Resource

Besides the physical capital indicators described above, human capital resources play an important role in the empowerment of women. The mean years of education was clearly higher among men compared to women in households in all EIAs as can be expected. The richer state, Punjab, had about 8 years of average education, the highest among all the EIAs. Further, 35 per cent had passed 10^{th} standard among both men and women. More importantly, there was no gender difference in years of education in this state.

Gender differentials: In the EIAs with poorer households, Komul and Manmul, the mean years of education were the lowest. There was minimal difference between men and women mean years of education. Lucknow, also with poorer households, however, had higher mean year of education among men, but women's mean year of education was half of the men's. On the contrary, Cuttack, with poor households had rather higher mean years of women's education and hardly any gender difference in mean education years.

Bhilwara and Maahi, with more middle income households, had low mean years of education. While there was less gender difference in education in Bhilwara; Maahi showed a greater gender difference, with women having only 3 years of education.

Table 4.4: Male and Female Mean years of education and Levels of Education among Females

EIA	Average Years of Education Male	Average Years of Education Female	Education Status of Female members of HHs (percentage)				
			Illiterate	Below Primary	Primary	VIIIth Pass	Xth Pass
Banas	6.0	2.0	69	5	15	6	3
Maahi	5.1	3.0	60	3	23	7	5
Komul	4.0	2.0	65	9	11	5	6
Manmul	4.3	3.0	51	17	11	7	10
Cuttack	4.9	4.0	26	9	50	7	7
Ludhiana	8.1	8.0	15	8	21	16	25
Ropar	8.2	8.0	12	8	26	15	26
Paayas	6.9	2.0	75	0	12	6	4
Bhilwara	4.2	2.0	75	3	10	6	3
Lucknow	7.9	4.0	56	1	12	14	6

4.5 WEDI: Women Empowerment in Dairy Index

Women's Empowerment in Dairy Index in terms of NDP and Non-NDP villages is presented in Table 4.5. There was a statistically significant difference in WEDI between NDP and non-NDP households as a whole. The difference in WEDI at EIA level was statistically significant only for Paayas. Cuttack scored the highest WEDI value of 0.87 and Maahi scored the lowest WEDI value of 0.48. The other EIAs with low income households, i.e. Manmul and Komul, had relatively low WEDI value. The high income households in Punjab, along with Paayas and Bhilwara with middle income households, had about middle level of WEDI value, between 0.59 and 0.69.

Besides the difference in physical infrastructure between the EIAs with top and bottom WEDI value, a significant difference in their human resources was noted. Cuttack had higher mean years of education among women than Maahi. Cuttack also had more than 50 per cent women having completed primary education, while in Maahi 60 per cent women were illiterate. This indicator alone appears to drive the women empowerment in Cuttack, an otherwise poorly endowed EIA.

Table 4.5: WEDI in NDP and Non-NDP EIAs

EIA	WEDI	Non-NDP	NDP
		WEDI	WEDI
Gujarat Banas	0.69	0.69	0.68
Gujarat Maahi	0.54	0.58	0.49
Karnataka Komul	0.60	0.64	0.55
Karnataka Manmul	0.57	0.54	0.59
Odisha Cuttak	0.89	0.83	0.95
Punjab Ludhiana	0.65	0.63	0.66
Punjab Ropar	0.64	0.65	0.64
Rajasthan Paayas	0.68	0.62	0.74
Rajasthan Bilwara	0.74	0.76	0.75
UP Lucknow	0.60	0.59	0.61

1. ** Significant difference between NDP and Non-NDP households
2. Payaas showed significant difference in NDP and non-NDP HHs.

Five domains of empowerment EIA wise are presented in Table 4.6. Clearly women in Cuttack scored very high on all the dimensions, particularly in production decisions, income dimension and leadership. Both the men and women had the highest overall scores in Cuttack. However, women in Maahi scored much lower on the five dimensions.

While Cuttack had predominance of physical resource poor households, it had high human capital among its women. This partly explains the high WEDI in Cuttack. Further, Cuttack Dairy was among one of the oldest. Historically, Cuttack district had two other women's movements besides the Women's Dairy Cooperative Leadership Program (WDCLP) under Operation Flood, the SHG or micro-credit movement and National Rural Livelihood Mission (NRLM) which also explains the high score in women's leadership in the EIA. The EIA Maahi, a producer company, is a recent entry into the dairy sector. It is located in the Saurashtra region of Gujarat, which gives much more importance to its traditional values. Women in this region are less educated with a high incidence of illiteracy. In the non-NDP villages, 69 per cent of women were found to be adequate in relation to production decisions as compared to 52 per cent in NDP villages. Similarly, proportion of women who were found to be adequate in income related decisions stood at 93 per cent in non-NDP villages as compared to 78 per cent in NDP villages. Notably, 100 per cent of the sampled women in non-NDP villages were satisfied with the quality of their leisure as opposed to 86 per cent in NDP villages.

Table 4.6: Five Domains of Women's Empowerment by EIAs

EIA	Percentage of Women Adequate in each of the 5 Domains (5DE)													Average Male Score	Average Female Score
	Production Decisions	Resource Domain							Income Domain	Leadership/ Membership		Work/ Leisure			
		Ownership of Resources	Selling of Resources	Purchase of Resources	Access to Credit	Borrowing Decision of Credit	Allocation Decision of Credit	Access to dairy Extension		Speaking in Public Meetings	Membership to Groups	Work load in Dairy	Leisure Satisfaction		
Banas	97	94	88	80	18	13	13	96	93	50	6	4	60	0.728	0.651
Maahi	60	57	56	51	17	9	8	70	85	9	0	5	93	0.646	0.501
Komul	85	89	87	87	12	5	6	67	97	11	20	9	12	0.697	0.563
Manmul	85	61	86	85	10	5	5	86	100	18	7	8	7	0.693	0.536
Cuttack	96	80	92	93	35	32	34	91	100	69	76	6	97	0.868	0.813
Ludhiana	81	63	65	65	17	2	2	89	100	38	6	0	96	0.655	0.608
Ropar	83	57	60	58	15	1	1	81	100	48	1	0	98	0.651	0.607
Paayas	91	63	66	69	2	1	1	97	79	79	5	7	68	0.731	0.631
Bhilwara	93	61	78	78	29	12	12	93	98	45	22	4	97	0.768	0.692
Lucknow	80	41	43	44	16	3	3	84	99	13	12	1	97	0.726	0.568

5. Impact Evaluation of NDP-I: Effect on Women Empowerment (WE) in Indian Dairy Households

5.1 Introduction

This part of the report focuses on understanding the impact of NDP-I on various dimensions of Women Empowerment (WE). Micro-econometric analysis has been conducted to estimate the impacts at the household level. As already noted earlier, five distinct dimensions of WE have been used for constructing the Women Empowerment Dairy Index (WEDI). These dimensions are: (1) Production (2) Resources (3) Income (4) Leadership (5) Leisure/Work. In addition to these, the gender parity index and few vignettes were used to assess the efficacy of NDP-I in enhancing the socio-economic status of women in dairy households.

Both, average program effects and heterogeneous effects were estimated to identify variations in the impact of NDP-I across various sub-categories in the target population. This part of the analysis is expected to elucidate the program design, strategic targeting, and potential areas of improvement.

5.2 Evaluating Project Impacts

We have approached the evaluation of NDP-I through Potential outcomes framework (Rubin, 1974). According to Morgan and Winship (2015), the core of potential outcomes model of causal inference is quite simple. The key assumption of the potential outcomes model is that each unit in the population of interest has a potential outcome under each state of existence, even though each unit can be observed in only one treatment state at any point in time. In other words, the

objective of program evaluation is to determine how the intervention influenced desired outcome(s). This is achieved by comparing the treatment effect against a counterfactual. The treatment effect of the program intervention on an individual i can be expressed as:

$\alpha_i = y_{i1} - y_{i0}$

where y_{i1} is outcome for an individual who participates and y_{i0} if she does not participate.

However it is not possible to observe causal effect of the program on an individual who participates and does not participate at the same time. Therefore program evaluation is a missing data problem (Khandker et al). In relation to NDP, the most challenging aspect of program evaluation is to estimate empowerment related outcomes for women participants if they had not participated in NDP. The parameters of interests are Average Treatment Effect (ATE) and Average Treatment Effect on Treated (ATT). ATE measures the effect of the program on both participants and non-participants. ATE on a participating woman, given a vector of characteristics **x**, can be expressed as:

$ATE = E [y_1 | \mathbf{x}] - E [y_0 | \mathbf{x}]$

ATT is the expected value of the outcome for those who participated in the program, conditional on the individual characteristics that influence program participation.

$ATT = E [y_1 | \mathbf{x}, NDP = 1] - E [y_0 | \mathbf{x}, NDP = 1]$

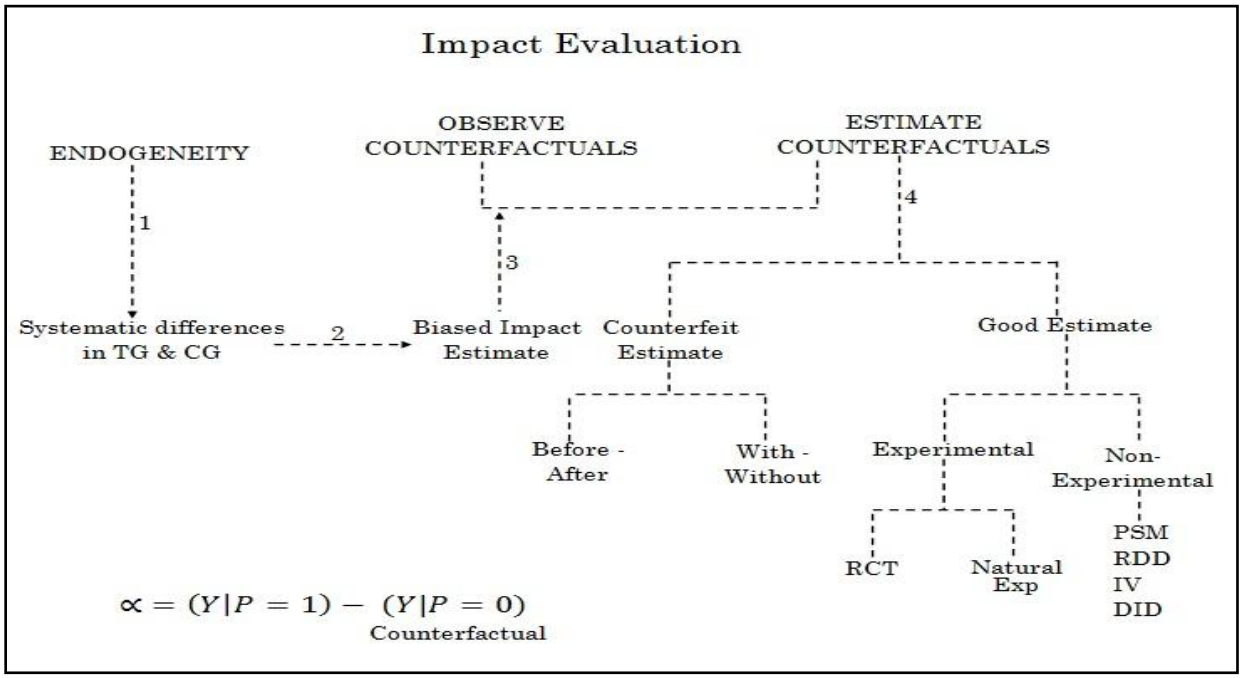
We have already mentioned that $E [y_0 | \mathbf{x}, NDP = 1]$ is the expected empowerment level of NDP women if did not participate in NDP, and hence it cannot be directly observed. However we can observe $E [y_0 | \mathbf{x}, NDP = 0]$, that is, expected outcome of untreated, given that they did not receive the program. Under the absence of selection bias, we can assume that those who participated in the program would have equal outcomes to those who did not, in the absence of the program. In other words:

$E [y_0 | \mathbf{x}, NDP = 1] - E [y_0 | \mathbf{x}, NDP = 0] = 0$

However it would not be possible to safely assume zero selection bias in the absence of randomized allocation of eligible individuals to treatment and control groups. NDP-I is a demand driven program and hence households exposed to the treatment will be systematically different from those who did not choose to participate in the program. In that case, it is quite likely that the differences in outcomes are due to pre-program differences. If these differences are not taken care of then it would distort impact estimates.

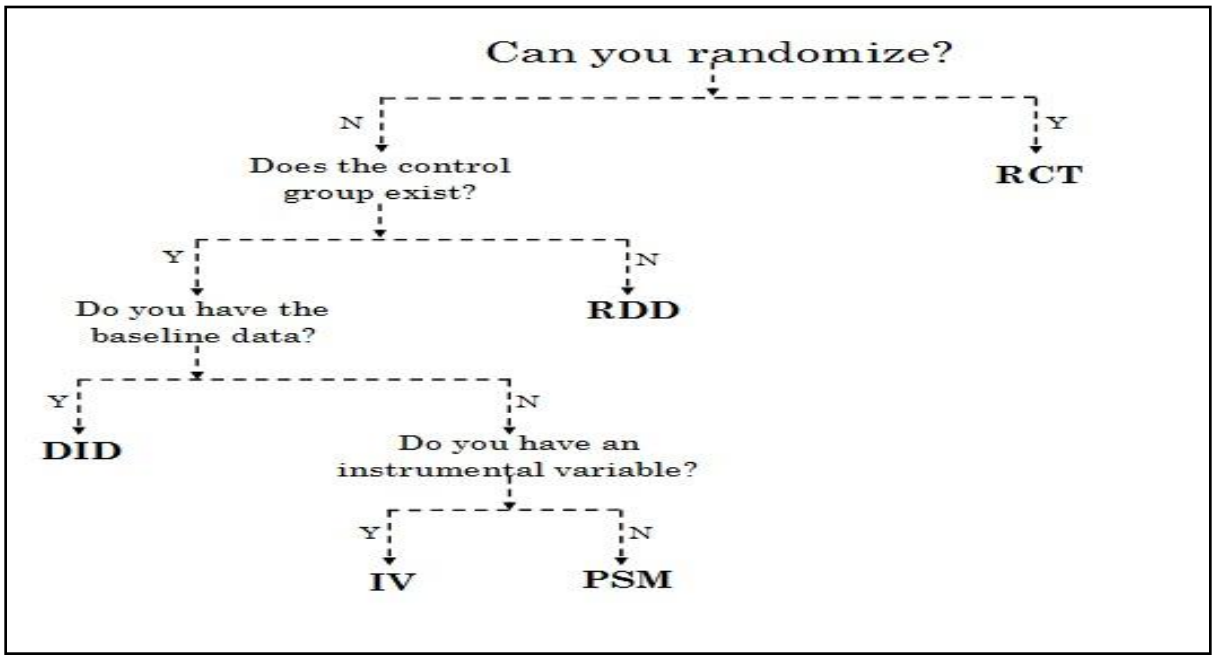
In addition to selection bias, there could also be program placement bias. Therefore the chosen evaluation methodology should be able to account for possible sources of endogeneity in program selection, spill-over effects, and heterogeneity of program impacts. The impact evaluation strategy has been outlined in the figure below:

Figure 5.1: Identification of Impact Evaluation Methodology in presence of Selection Bias



In the presence of selection/program placement bias (endogeneity), the control group households would be systematically different from treatment group. For instance, in the NDP study these differences were observed in relation to household characteristics, primary source of income, land allocation to agricultural activities, religion, caste, participation in other government and NGO programs, etc. In addition to observed, there are several unobserved characteristics that may get correlated with program participation and empowerment related outcomes. As already noted, NDP-I was not rolled out using RCT, hence we had to use one of the non-experimental techniques or some combination of them. The figure below summarizes our decision making problem and how did we go about choosing the appropriate program evaluation methodology:

Figure 5.2: Identification of Impact Evaluation Methodology in absence of random allocation



The above figure outlines some of the basic conditions for using one of the available quasi-experimental methodologies. We started by asking the question that whether the research team

has access to baseline data. We were made available the report on baseline data that contained summary statistics on various household, community and cattle characteristics. The data did not explicitly summarize women's social status, opportunities for engaging in the decision-making process, and ability to participate in village level affairs. In addition to that, the process of identifying treatment and control group areas were not explicitly spelled out. In the absence of identifier information on control and treatment group units, we were precisely left with three options, RDD, IV and PSM. In the absence of a cut-off rule that guides selection to the program, RDD method could not be utilized. The IV method strongly hinges on the availability of exogenous proxies for program participation. The research team did not observe such consistent factors that can be used to replace participation variable but themselves they remain unaffected by unobserved factors. The study finally zeroed on matching methods, specifically Propensity Score Matching (PSM) Method for estimating the counterfactual group that can be made appreciable free from selection bias problem. We were able to address the program placement bias by utilizing the pipeline method for selecting control villages.

5.3 Matching Propensity Based Methods

The social scientists who adopt a counterfactual perspective, matching methods are fast becoming an indispensable technique for addressing causal effects of development programs on socially desirable outcomes. PSM consists of choosing the comparison group according to the probability of being selected for the program, given the set of observable characteristics that do not themselves get determined by program intervention but in turn influence program participation and outcomes.

Consider the case of NDP-I program in which we are attempting to evaluate the impact on gender empowerment. Our data set contains both types of households, that enrolled and that did not enroll in the program. The NDP program did not have any clear assignment rule that why some households enrolled and others did not. Given this background, PSM will enable us to identify a set of control group households that look very similar to the treatment group households, based on the characteristics for which the study team has collected the data. In essence matching uses statistical algorithms to construct an artificial comparison group we use to estimate the counterfactual, that is, E [y_0 | **x,** NDP = 1]

Estimation of the Selection Model and Propensity Scores

The first step is to estimate the propensity scores (that is, probability for participation and non-participation): Prob [NDP=1|**x**]. We have used the EIA fixed effects logistic regression for specifying the selection model. The representative model has been presented below:

$$log\frac{p(NDP=1)}{1-p\ (NDP=1)} = \beta_0 + \beta_1 religion_i + \beta_2 caste_i + \beta_3 fem\_educ_i + \beta_4 fem\_bankacc_i +$$

$$\beta_5 hh\_own_i + \beta_6 hh\_type_i + \beta_7 land\_size_i + \beta_8 income\_source_i + \beta_9 group\_member_i + u_i$$

Table 5.1: NDP-I Participation Model

Selection Factors	Prob (NDP=1 | x)	Standard Error
Muslim	0.43	0.09**
SC	-0.08	0.045
OBC	0.083	0.03*
Water Use	0.09	0.02**

Wasteland	0.013	0.005*
Agri_main_income	-0.08	0.03*
Non_Aglab_main_income	-0.21	0.07*
Group_Member	0.15	0.02**

* Significant at 5%; ** significant at 1%

The above table presents a partial list of variables that were used to construct the participation model and estimate propensity scores. The propensity score is estimated using various socio-demographic characteristics of dairy households: education, age, religion, caste, income and assets, etc. Looking at the standard errors, we can assert that participation is related to religion, and that Muslim households have a higher probability of participating (43%), although based on t-statistics, the effect of SC households on participation appears not to be significant. Furthermore, availability of water for non-drinking purposes at the doorstep, size of wasteland, and membership in other village-level groups positively affect the propensity score, while households whose primary source of income is either agriculture or non-agricultural labor, are less likely to participate in NDP-I. Households having salaried members, or who have a micro-enterprise do not seem to explain participation.

5.4 Estimation of Average Program Impacts on Women Empowerment

In Chapter 3 we have introduced and extensively discussed WEDI (Women Empowerment in Dairy Index), a variant of IFPRI's WEAI. For the purpose of micro-econometric impact assessment, we would be utilizing components of five broad empowerment dimensions, the

gender parity score, and some general empowerment indicators. A brief description of these indicators is shown in table 5.2.

Table 5.2: List of Women Empowerment Indicators

Key Areas	Indicators
Production Related Decision Making	Participation in decisions related to selling milk
	Participation in decisions related to vaccination and veterinary services
	Participation in decisions related to cultivation of animal field
	Participation in decisions related to buying of animal
	Participation in decisions related to Artificial Insemination of milch animal
Resource Related Decision Making	Ownership of milch animals and milk produced
	Participation in decision related to selling milch animals and milk produced
	Participation in decision related purchasing of milch animals and milk produced
	Access to credit facilities during last 12 months
	Participation in borrowing decision making
	Participation in decisions related to the allocation of borrowed money
	Regularity in the use of veterinary services in past 12 months
	Regularity in the use of artificial insemination service in past 12 months
	Regularity in the use of animal feed and nutrition advisory service in past 12 months
Income Related Decisions	Participation in decisions related to the use of income generated from the sale of milk
	Participation in decisions related to the use of income generated

Key Areas	Indicators
	from the sale of milk
Group Membership	Membership in agriculture/livestock/milk producers or marketing group
	Membership in water user's group
	Membership in forest user's group
	Membership in credit/ micro-finance group
	Membership in panchayat
	Membership in other groups
Speaking up in public	Comfort in speaking up in public on infrastructure
	Comfort in speaking up in public on wages
	Comfort in speaking up in public on misbehaviour of the authorities
	Comfort in speaking up in public against malpractices of local 'Dudhia'/ cooperative dairy
Work/ Leisure Indicators	Number of hours spend on dairy activities
	Satisfaction derived from leisure activity

5.5 Average Treatment Effect on Treated

The parameter that we are interested in is the Average Treatment Effect on Treated (ATT). We have used three types of matching algorithms to perform robustness checks of the impact estimates. These are caliper, radius, and kernel matching. It is essential to note that by this stage we have got a group of households from the treatment and control areas that have similar observed characteristics. Therefore the estimated ATT would indicate the impact of NDP-I on various dimensions of women empowerment

Production Dimension

The production dimension is concerned with the role of women in the dairy production activities. The production decisions that were included in the study were related to sale of milk, vaccination & veterinary services, cultivation / purchase of animal feed, and artificial insemination of the milch animals.

The summary statistics from the treatment and control areas are presented below:

Table 5.3: Descriptive Statistics on Production Indicators

Production Indicators	NDP	Non-NDP	t-value
Participation in decisions related to selling milk	0.82 (.38)!	0.77 (.42)	-3.04**
Participation in decisions related to vaccination and veterinary services	0.79 (.40)	0.79 (.40)	0.05
Participation in decisions related to cultivation of animal field	0.80 (.39)	0.81 (.38)	0.77
Participation in decisions related to buying of animal	0.73 (.44)	0.75 (.43)	0.944
Participation in decisions related to Artificial Insemination of milch animal	0.52 (.49)	0.55 (.49)	1.56

* Significant at 5%; ** significant at 1%

! Figures in parenthesis are standard errors of the estimates

The treatment effect of NDP-I on women's participation in above mentioned production decisions are presented in table 5.4 below:

Table 5.4: Impact Estimates: Production Dimension

Do female participate in following production decisions?	Caliper	Radius	Kernel
Selling Milk	0.047**	0.03*	0.04**
Vet Services	-0.018	-0.02	-0.017
Cultivate Feed	-0.02	-0.04**	-0.03
Buy Feed	-0.024	-0.04**	-0.03
AI Services	-0.011	-0.05**	-0.032

* Significant at 10%; ** significant at 5%, *** significant at 1%

As mentioned above, three matching algorithms have been used to perform robustness checks of impact estimates. For reporting of the impact, we would be consistently using the results associated with kernel matching. Table 5.4 indicates that NDP had a positive impact on women's participation in decisions related selling milk. In fact women in program villages are 4% more likely to influence selling decisions. This result has important implications for successful targeting of NDP, that is, if the program implementers can convince women regarding the need to get connected with formal value chains, then newly established Dairy Cooperative Societies (DCS) under the VBMPS are likely to take off successfully and existing DCS may get further strengthened.

The results in table did not indicate significant and robust impact of NDP-I on other aspects of production activities.

Income and Leadership Dimension

The income dimension focused on understanding the role of women in the deciding the use of dairy income. A 5 point Likert scale was used to elicit the extent to which women can determine the use of household's dairy income. The leadership dimension investigated whether women are comfortable to speak in public on issues related with village level infrastructure requirements, fair wages, misbehavior and malpractices of local 'Dudhia' / DCS / other milk buyers in the village. NDP and non-NDP women were also enquired if they held leadership position (president, secretary, treasurer, etc.) in a village-level organization such as panchayat, credit groups, milk producer/marketing groups, etc.

The summary statistics from the treatment and control areas are presented below:

Table 5.5: Descriptive Statistics on Income and Leadership Indicators

Income & Leadership Indicators	NDP	Non-NDP	t-value
Participation in decisions related to the use of income generated from the sale of milk	0.93 (0.24)	0.93 (0.23)	0.27
Participation in decisions related to the use of income generated from the sale of milk	0.93 (0.24)	0.93 (0.24)	0.19
Membership in agriculture/livestock/milk producers or marketing group	0.16 (0.36)	0.12 (0.33)	-2.40*
Leadership position in agriculture/livestock/milk producers or marketing group	.017 (0.13)	0.01 (0.13)	0.43
Membership in water user's group	0.0008 (0.028)	0	-1.00
Membership in forest user's group	0.0008 (0.028)	0	-1.00
Membership in credit/micro-finance group	0.004 (0.06)	0.02 (0.15)	4.03**

Income & Leadership Indicators	NDP	Non-NDP	t-value
Leadership position in credit/ micro-finance group	0.001 (0.04)	0.008 (0.09)	2.30*
Membership in Panchayat	0.10 (0.30)	0.08 (0.27)	-1.58
Leadership position in Panchayat	0.01 (0.10)	0.003 (0.05)	-2.20*
Comfort in speaking up in public on infrastructure	0.32 (0.46)	0.29 (0.45)	-1.55
Comfort in speaking up in public on wages	0.29 (0.45)	0.26 (0.44)	-1.87
Comfort in speaking up in public on misbehaviour of the authorities	0.29 (0.45)	0.26 (0.44)	-1.69
Comfort in speaking up in public against malpractices of local 'Dudhia/ cooperative dairy	0.34 (0.47)	0.33 (0.47)	-0.

The treatment effect of NDP-I on use of income and leadership are presented in table 5.6 below:

Table 5.6: Impact Estimates: Income and Leadership Dimension

Outcomes	Caliper	Radius	Kernel
Use of Milk Income	0.006	0.006	-0.002
Infrastructure Discussion	0.03	0.045**	0.05**
Fair Wages	0.053**	0.054**	0.06**
Protest Misbehavior	0.06**	0.047**	0.045**
Protest Malpractice	0.01	0.03	0.02
Panchayat Leader	0.008*	0.006*	0.007*

Outcomes	Caliper	Radius	Kernel
Credit Group Leader	-0.005	-0.01***	-0.009**

* Significant at 10%; ** significant at 5%, *** significant at 1%

The ATT estimates presented in table 5.6 indicate that NDP did not significantly improve women's participation in the use of dairy income; however the program did result into a positive and statistically significant impact on various dimensions of leadership. Average women in program villages were found to be 5% more likely to participate in village-level infrastructure discussion, while they are 6% more likely to demand fair wages for public works as compared to average women in non-Program villages. Hence the NDP program may indirectly enhance the efficacy of rights based programs such as MGNREGS. The probability that a female would publically protest misbehavior of authorities and elected officials has appreciated by 4.5%. The last two impacts in a sense are likely to reinforce each other.

Resource Dimension

The resource dimension was constructed to investigate the role of women in decisions pertaining to sale and purchase of productive capital, and in accessing dairy extension services, such as, veterinary services, artificial insemination services, and animal feed and nutrition advisory services. The summary statistics from the treatment and control areas are presented below:

Table 5.7: Descriptive Statistics on Resource Indicators

Resource Indicators	NDP	Non-NDP	t-value

Participation in decision related to selling milch animals	0.67 (0.46)	0.62 (0.48)	-2.40*
Participation in decision related to selling milk produced	0.70 (0.45)	0.67 (0.46)	-1.81
Participation in decision related purchasing of milch animals	0.65 (0.47)	0.62 (0.48)	-1.56
Participation in decision related purchasing of milk produced	0.697 (0.45)	0.66 (0.47)	-1.76
Regularity in the use of veterinary services in past 12 months	1.72 (1.72)	1.74 (1.81)	0.34
Regularity in the use of artificial insemination service in past 12 months	1.16 (1.36)	1.149 (1.65)	-0.29
Regularity in the use of animal feed and nutrition advisory service in past 12 months	2.63 (7.11)	3.66 (8.27)	3.28**

The treatment effect of NDP-I on women's participation in above mentioned resource based decisions are presented in table 5.8 below:

Table 5.8: Impact Estimates: Resource Dimension

Outcomes	Caliper	Radius	Kernel
Cattle Sale	0.04**	0.08**	0.08**
Buy Cattle	0.05	0.066	0.064
Milk Sale	0.011	0.05	0.06
Used Extension Service	0.04**	0.04**	0.05***
Vet Service Count	-0.065	-0.04	-0.04
AI Service Count	-0.009	-0.02	0.003

Nutrition Service Count	-1.16**	-1.03**	-0.95**

* Significant at 10%; ** significant at 5%, *** significant at 1%

The impact estimates presented in table 5.8 indicate that the probability that males located in NDP villages would unilaterally take the decision to sell cattle is 8% less as compared to control villages. Results also indicate that the program has been successful in inducing women to use extension services. The program has increased the opportunities of accessing at least one of three types of extension services by 5%. This result is essential to compare with the frequency with which females in NDP villages have accessed extension services in last 12 months as compared to control group females. While the number of times NDP and non-NDP women accessed veterinary and AI services are similar, NDP women used animal feed and nutrition advisory services less number of times as compared to non-NDP women[12]. Since provision of animal feed and nutrition advisory services form the core of Ration Balancing Program (RBP) component of NDP-I, it is quite likely that the Local Resource Persons (LRPs) have been effective with enlisting dairy households in the RBP program but their follow up activities has to be intensified further.

Leisure and Work Dimension

The leisure dimension is concerned with assessing the quality and quantity of leisure of women in dairy households, whereas the work dimension focused on understanding the extent to which women are engaged in various types of dairy activities on a typical day. Some of these activities

[12] This result should be interpreted with caution since the systematic provision for nutrition and advisory services has been made for the first time under NDP-I. Therefore it is non-NDP households may have reported the nutrition advisory services that they may have received by paying a commercial fee under this head.

include cleaning of cattle shed, animals & milk vessels, collection of animal feed, milking and pouring milk, and grazing and fetching water for cattle.

The summary statistics from the treatment and control areas are presented below:

Table 5.9: Descriptive Statistics on Leisure & Work Indicators

Leisure/Work Indicator	NDP	Non-NDP	t-value
Satisfaction level with leisure activities	3.58 (1.65)	3.54 (1.56)	-0.53
Average hours of sleep in 24 hours	7.66 (1.05)	7.81 (1.01)	3.58**
Minutes spend in cleaning of cattle shed	52.08 (35.65)	44.97 (28.45)	-5.43**
Minutes spend in cleaning/ care of animals	46.65 (28.51)	45.09 (30.90)	-1.29
Minutes spend in collecting/ preparing fooder	57.62 (47.93)	53.35 (46.28)	-2.23*
Minutes spend in preparing cattle feed	39.09 (32.42)	41.77 (37.23)	1.88
Minutes spend in feeding animals	38.98 (34.10)	40.44 (38.00)	0.99
Minutes spend in milking animals	33.02 (21.13)	32.18 (22.12)	-0.95
Minutes spend in pouring milk	19.29 (20.36)	20.29 (21.22)	1.17
Minutes spend in grazing cattle	49.40 (111.25)	77.80 (140.80)	5.50**
Minutes spend in fetching water for cattle	25.21 (21.71)	23.98 (20.49)	-1.44
Minutes spend in cleaning of milk vessels	29.17 (23.20)	25.94 (20.77)	-3.61**

The treatment effect of NDP-I on women's leisure and work activities are presented in table 5.10 below:

Table 5.10: Impact Estimates: Leisure and Work Dimension

Outcomes	Caliper	Radius	Kernel
Sleep	-0.13**	-0.01**	-0.1**
Leisure Activities	0.13	0.07	0.04
Poor Health	-0.07	0.005	0.015
Clean Shed	7.9***	6.26***	1.44***
Clean Animals	3.39**	0.81	2.50*
Collect Fodder	2.07	2.7	3.07
Prepare Feed	-2.64	-3.30	-2.33
Grazing	-29.18***	-31.34***	-28.13***
Clean Milk Vessels	5.05***	3.53***	2.98**

** Significant at 10%; ** significant at 5%, *** significant at 1%*

Impact estimates presented in table 5.10 indicate that women in program villages get significantly less amount of sleep as compared to comparison group females; however the size effect is very small. The effect on quality of leisure is not significant. It is interesting to note that NDP women spend more time in cleaning animals, sheds and milk vessels. These activities significantly contribute to quality of milk poured at DCS. The study team found that the major portion of program related circulars and advertisements that were distributed in villages stressed

on the need to maintain cleanliness in milking activities. These results indicate that these messages may have been effectively communicated.

5.6 Impact of NDP-I on Gender Parity

Chapter two has discussed the methodology of computing Gender Parity Index (GPI). The matched households (based on kernel matching algorithm) were used to assess the effect on GPI. The GPI score is comprised on male and female score. We took the difference of female and male score. Therefore when GPI=0, both males and females are considered to be equally empowered at the households level, when GPI>0, females are more empowered than their male counterparts.

The table below presents the regression results of impact estimates

Table 5.11: Impact on Gender Parity

Variables	Coefficient	Std. Err.	t-value
NDP	-0.008	0.009	-0.67
NDP*VBMPS	0.038***	0.011	3.36
NDP*RBP	0.058***	0.011	5.29
Group Member	0.035***	0.0066	5.25
NDP * Fem_Educated	0.0064**	0.0028	2.28
Female Bank Account	0.022***	0.0058	3.86
NDP*bpl	-0.034***	0.009	-3.63
NDP*Fem_Vill_Head	-0.002	0.011	-0.20

* Significant at 10%; ** significant at 5%, *** significant at 1%

The regression results indicate that both VBMPS and RBP villages contributed to the GPI, however RBP effect is more pronounced than the VBMPS[13]. As expected, women who participate in other village level groups and have their own bank account, have a higher GPI, irrespective of whether they are located in the program or control villages. The education effect was further magnified in NDP villages.

[13] RBP effect may be greater that VBMPS on account of WEDI construction. Majority of the index parameters give score on dairy related decisions, for instance decisions related to feeding milch cattle, sale of milk, etc. These variables are likely to be influenced more by RBP subcomponent as compared to VBMPS.

6. Project Strategies, Processes and Achievements

The study team conducted the process evaluation to assess the effectiveness of the program strategies and processes that are involved in achieving intended program goals and objectives. Qualitative data was collected from EIA officials, Project Functionaries (PF), Dairy Cooperative Societies (DCS), women dairy farmers and other stakeholders. The data was collected through in-depth structured interviews, semi-structured interviews, Focus Group Discussions and informal discussions with other relevant stakeholders. The data was analyzed to present independent findings and observations on different aspects of interventions that includes: 1) Women DCS and women membership, 2) Women's role in milk union boards and committees, 3) Inclusion of women as project functionaries, 4) Trainings and Capacity Building Programmes, 5) Access to Extension Services, 6) INAPH database, 7) Interface between EIAs and NDDB, and 8) Interface between DCS and EIAs.

The chapter discusses all of the above mentioned aspects in detail and puts forward the progress made as well as issues and challenges faced by the EIAs and PFs.

6.1 Formation of Women DCS

Establishing new women DCS is an important element of NDP-I for promoting women empowerment in dairy sector. NDDB has set annual targets for EIAs with regards to formation of women DCS. Initially the target was to organize new DCS with a minimum women membership of 30%. Later, this was revised upwards to at least 50% women membership in new DCS. EIAs have been provided guidelines towards meeting this target in all the existing DCS

which are being further strengthened under NDP-I and formation of new DCS as women DCS in future.

EIAs have also been provided with a NDP-I funded lady extension officer (LEO) in each VBMPS sub-project in order to ensure above mentioned targets. Observations gathered across 10 EIAs indicate that the formation of new women DCS organized under NDP-I range from 22% to 50%. However most of the EIAs have either achieved or are getting closer to the target of 50%. For instance Banas Dairy in Gujarat has registered 81 new DCS, out of which 56 DCS are women DCS. Banas is now planning to register all new DCS as women DCS with women representing all the positions in the DCS. Bhilwara Milk Union in Rajasthan has registered 117 DCS under VBMPS and the target is to register 284 DCS. In Bhilwara, out of 1000 registered DCS, 485 are women DCS.

In Ludhiana, the actual performance is below the stated target. Out of 62 new DCS, only 19 are women DCS. In Ropar, out of 48 newly formed DCS, 12 are women DCS. In both the places, the number of women DCS are less than the previous target, i.e. 30%. In Punjab, EIAs are finding difficult to engage women in public activities. Even though women take care of dairy activities in households, encouraging them to become DCS member is a difficult proposition.

Cuttack Milk Union had organized 42 new DCS under VBMPS programme, out of which 19 were women DCS. The EIA is trying to strengthen 302 existing DCS. Out of the 302 existing DCS, 80 MPCS have been converted into 80 Women DCS with 7564 women members. In Kolar

Milk Union, out of total 1722 DCS, 170 are women DCS. Under NDP-I, A total of 60 DCS have been formed in Kolar, out of which 16 are women DCS.

It usually takes longer to open women DCS than a general DCS. Considerable efforts and resources are required to enable EIA officials to undertake numerous visits to each village site and organize meetings and awareness programs to encourage formation of new DCS. In fact NDP-I has provided the opportunity to put intensive efforts in this regard. Since funds and training support is now available through NDP-I, EIAs have been successful in intensifying their efforts in establishing women DCS.

6.2 Expanding women membership in existing and new mixed DCS and women participation in dairy activities/programs organized by EIAs

Women membership in mixed DCS varies from 30 to 50 per cent. Most EIAs have already achieved the NDP-I target. Other EIAs are gradually approaching program targets with regards to strengthening of existing DCS. However, the progress in enrolling women members is still slow. Some EIAs have achieved the target of 30% women membership in the DCS and they have now set the target of 50% women membership in mixed DCS. The reason behind slow progress is that several existing DCSs have huge membership base and are hence reluctant to enroll additional women members. Members in mixed DCS are predominantly male. In order to enroll more women, the membership base of the DCS has to be increased. Many DCS have already reached the saturation point, i.e. almost all households that are pouring milk are already members of the DCS. Therefore, there is hardly any scope for enrolling additional members. In households

with male DCS members, even though the number of animals has increased, women cannot be registered as DCS member because the DCS follows one member per family norm.

Banas Milk Union in Gujarat is a pioneer in women enrollment. Under the RBP subcomponent, Banas has registered 12000 dairy farmers, out of which 6000 (50%) are women. Banas Milk Union has a Cooperative Development Cell at the union level that supports establishment of new DCS along with expansion of their membership. The cell has 26 Women Cooperative Development (CD) Instructors who help organize women DCS and spread awareness on different aspects of dairy business.

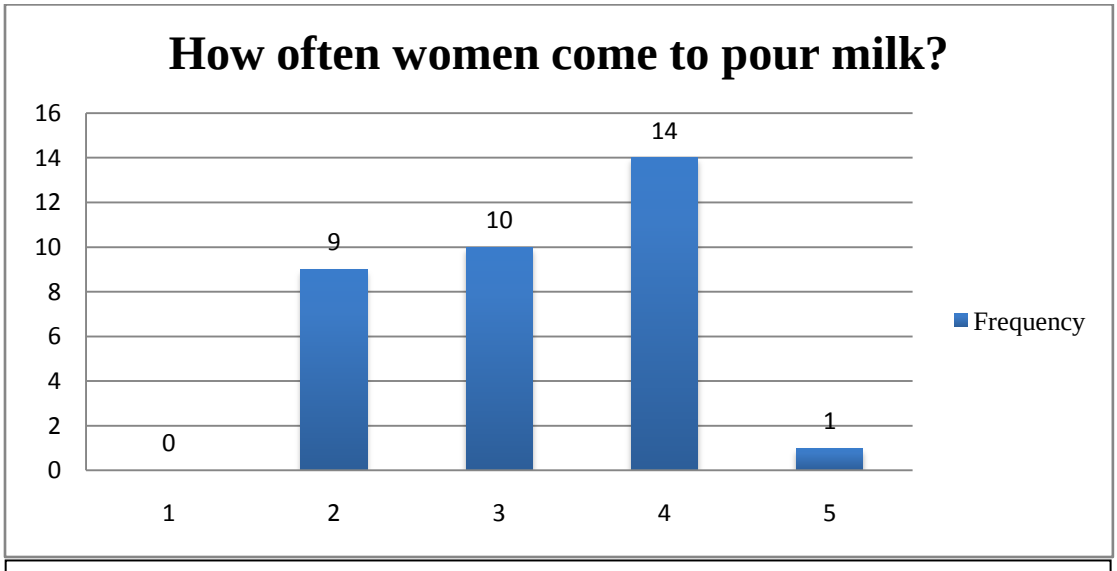
The most significant involvement of women in dairy related programs has been observed in Village Awareness Programmes (VAPs), Farmer Orientation Programs (FOPs) and Calf Rallies. Women, mostly from landless and marginal farmer families, participate in such programs. Banas Milk Union has organized 161 such awareness programs and meetings on different components of NDP-I. Out of total of 9000 participants in these programs, 3000 were women. Banas is also organizing VAPs exclusively for women. These programs are being organized in three to four locations in a village, so that women may find it convenient to attend one such event in the vicinity of their households. This step is especially helpful for those women, who are not allowed to go alone far from their house, for instance daughter-in-laws.

In order to promote women's access to dairy income, bank accounts are being opened in their name. In Banas Milk Union, transfer to bank accounts has been implemented in 111 DCS. These women have received ATM cards, so that they don't have to visit the bank for withdrawals. The

union is also providing subsidies on instruments like chaff- cutters, milking machines etc. More than one lakh women members have availed these benefits till date. The union is now planning to restrict this subsidy to only women.

Apart from membership, participation of women in dairy related activities is also very important. A survey carried out among 37 project functionaries indicates that women come to pour milk at the DCS more often than males. Women participation has also increased in other dairy related activities organized under NDP-I. This is quite evident in Bhilwara Milk Union where emphasis is being given largely on women participation. Different dairy related programs, such as VAPs, CMPs & FOPs are being organized at the village level frequently. In FOPs, Bhilwara Milk Union is inviting women in batches. Initially the Union did not have the budget to organize such programs, but now they are able to engage in these efforts with the financial support received under NDP-I. NDP-I grant is available for organizing different training and awareness programs as well as for providing logistic and technical support to EIAs; such as support for providing milk collection kit, furniture for new societies, milk cans etc.

Figure 6.1: Frequency of milk pouring



1- Never, 2- Sometime, 3 – Often, 4 – More often, 5- Every time

In Bhilwara, nine zonal officers at the end of every month, prepare a progress report on women participation in EIA organized programs and activities. It has been observed that these programs are increasingly attracting women. Milk procurement has also increased. In the annual general body meetings, emphasis is being laid on encouraging women members to participate. The EIA is also striving to open bank accounts for women in order to transfer milk related payments to their accounts. Among the few issues that Bhilwara Milk Union is facing with respect to women participation is that EIA has inadequate staff which can converse in local language. This is particularly required to motivate women to open and operate their bank accounts, and access the dairy income.

In Lucknow Milk Union, 11 women DCS were organized under NDP-I. Lucknow EIA is behind their women membership target. More intensive efforts are required in order to achieve the target. Lucknow EIA has not emphasized much in its efforts to increase women membership in dairy societies. Also, the EIA is also not offering any subsidy in dairy related programs to attract women. However, EIA has been trying to open bank accounts for women members. The EIA is facing social and cultural constraints. Eastern and central parts of UP are conservative in terms of women's engagement in the activities that require their presence outside the household. Women participation in the DCS meetings and other DCS level dairy activities is not as enthusiastic as it has been observed in other EIAs. Under the RBP, cattle are not necessarily being registered in the name of women members of the family. Many dairy farmers do not show interest in ear-tagging of their cattle as they fear that they would not be able to sell their cattle if they are tagged, because the buyer might think that cattle was bought on loan and the loan has not been repaid yet.

Maahi Milk Producer Company is doing relatively better in achieving the targets. They are putting efforts to increase women membership as well as participation in dairy related activities. Under Maahi, initially only 8.7% members were women, and then it dropped to 8.4%. The Governing Board of Maahi was requested by Maahi officials to launch special drives to increase women membership. Now, Maahi runs special membership drives for women twice a year. Registration fee for women members has also been reduced as compared to the registration fee for male members. Currently, 22.3% of the total members are women. In one year, Maahi has been able to increase women membership from 5954 to 17000. During the last three drives, women enrollment increased by 31%, 24% and 25% respectively. Maahi's Governing Board allows two such drives in one year. However, number of such drives can be further increased, as it has given positive results. Similarly, women participation in the annual general body meetings was very less. Subsequent to this, efforts were made to encourage women to participate in general body meetings. In the second general body meeting, women participation was about 30% of the total participation.

Special initiatives taken by Banas Milk Union for women empowerment:

- Union is providing education scholarship for children of widows. A scholarship of Rs. 5500 per year is given to one child and Rs. 11000 per year is given to two children up to the college level.
- Union under a campaign - '*Beti Bachao Kuposhan Hatao*' is providing women with free ghee at the time of birth of her child. Union gives 2 kg ghee if the baby is a girl and 1 kg if the baby is a boy.
- Union gives *Shresht Banas Laxmi* prize to highest milk pourer woman.
- Union organizes competitions for per animal milk production and prizes are given to women pourers. First prize is Rs. 5000. The Union provides Rs 500 as an encouragement to next 10 women who have achieved highest per animal milk production.

Another produce company, Paayas has also been able to keep its progress in terms of women enrollment and participation, on track. Under NDP-I, in all components, the average women membership is about 46%. Overall share of women membership in the company is about 37%. Paayas has reduced registration fee for female members. Paayas has also established 20 only-women MPP in the previous year. In these MPPs, all the members and *Sahayak* are women. Although Paayas has set up a target to establish 80% of the total new MPPs as women only MPPs during the previous year; the achievement was 50%. Similarly the target of ensuring women membership in all MPPs under NDP-I was 50%, the actual achievement was 36%. In the current year (2015-16), Paayas intends to establish 50 exclusive women MPPs. In terms of participation in dairy related programs, about 22% women participation had been recorded in VAPs and about 33% women participation has been observed in CMPs. In fodder development/silage making demonstration, about 38% women participated. In mower demos, 22% women participation was observed.

In addition to enrolling women in DCS, EIAs are also strived to enhance women participation in awareness programs and rallies organized by the EIAs. Village Awareness Programs (VAPs) are being organized on issues of feeding, cattle management, calf rearing and other dairy activities. These programs not only increase women participation but also disseminate pertinent knowledge on day to day dairy activities. Since mostly women take care of day to day dairy activities, participation of women in these programs becomes important. These programs are open for members as well as non-members. In order to attract more women, such meetings and programs are organized at places convenient for women. Women come to such programs with their children. If the food and refreshments are available, they stay for the entire duration of the

program. At the DCS level, committee members and secretaries are being encouraged to convince women to participate in the various NDP-I activities.

Another important strategy that has been used to enhance women participation in dairying is deployment of women to undertake different field level responsibilities under NDP-I. As already been mentioned, women take care of most of the dairy activities at the household level, it is easier for women functionaries to interact with the women members of the family. Lady Extension Officers, women MAIT and women LRPs have been successful in reaching out to women dairy farmers. When women beneficiaries are engaged in the household activities, women functionaries enter in the house and interact with women without disturbing their work schedule.

Table 6.1: Women's Participation in DCS Meetings

	Question asked from women	**Percentage of NDP Households (%)**
1	Participation in DCS meetings	26.30
2	How many women understood what was discussed in DCS meetings	14.56
3	How many women discussed/ asked questions in DCS meeting	6.04
4	How many found timing to be suitable for DCS meeting	17.87

Source: Author Survey

The survey data suggests (see table 6.1) that women participation in DCS meetings and activities is significant. However, participation should not be understood just by women presence. Women

should also participate in discussions and ask questions. While their presence in meetings is satisfactory, it is not ideal yet. Women participation in discussions and asking question is comparatively low (table 6.1). EIAs should make follow-up efforts to ensure the quality of participation of women. This can be done through formal or informal post-event interaction/feedback with few women participants. In order to realize empowerment of women, it is important that women members also take active participation in the discussions and ask questions on concerned issues. It is also advisable that time and venue of such meetings and programs must be decided keeping women's convenience in mind.

6.3 Strengthening Women's role in board and committees

EIAs are also focusing on inclusion of women in their governing bodies and management committees and other leadership positions at the DCS level. All EIAs covered in this study reported to have reserved positions for women or have included them in the governing body through formal electoral processes. On an average, two to three women members are part of the governing bodies of almost all EIA under the study. Maahi intends to increase position for women in its governing body. Under an encouraging move, Bhilwara Milk Union is currently discussing a proposal which seeks relevant changes in the by-laws of DCS in order to include more women in the decision making positions. Recently the Cuttack Milk Union has elected its governing body. The elections were held under the observation of the State Government. Among 15 elected members in the board of directors, four members are women, including the woman president.

Forming women DCS and increasing membership in these DCS further takes some time. It has also been observed that initially women membership in new DCS remains low. It picks up after sometime when non-member women observe women members getting benefitted from their association with the DCS. One important issue that almost all EIAs covered in this study are facing is that EIAs do not get appropriate women candidate for the membership in governing body and for the post of secretary in women DCS. Women in the governing body and the secretary must be active and educated enough to run the society. Therefore, by compulsion, EIAs keep male members in the governing bodies of women DCS. In few women DCS, male members are also holding the post of the secretary. Though it is not clear as to how long this trend will continue, EIAs are hopeful that existing women members, after few years of work experience and exposure, would be able to represent these positions without the help from male members.

6.4 Inclusion of women as project field functionaries

The inclusion of women as project field functionary is not systematic and the numbers of women project functionaries vary highly across EIAs. All EIAs covered in this study, except Ropar and Ludhiana, have recruited women LRPs. Although the total number of women LRPs is substantially less than male LRPs, EIAs intend to balance this ratio in future. In Cuttack Milk Union, till recently, there were no women LRPs. Now they have 78 women LRPs. The selected candidates have been sent for the training in June 2015. Cuttack Union aims to select 200 LRPs for the sub-project.

Banas has trained 17 women LRPs and another 15 women LRPs were under training during the field visit of the study team. Bhilwara also has inducted 18 women LRPs. Ludhiana has recruited

247 LRPs, however all are male. Ludhiana had recruited three women LRPs earlier but later on women LRPs left the job. Maahi had most number of women LRPs among all EIAs covered in this study. Out of 850 LRPs in Maahi, 163 LRPs were women. Paayas had trained 27 women LRPs. These women LRPs have completed more than 3300 animal registrations and were providing ration balancing services to the registered animals. Lucknow Milk Union is however struggling to recruit women LRPs as The Union is not able to attract applications from women.

EIAs under study have reported that women LRPs usually leave the job after some time of their training. The major reason is that the daughter-in-laws are rarely allowed to work outside the house. Similarly, daughters leave soon after their marriage. Therefore, getting women LRPs for a longer period of time is a challenge. EIAs invest significant amount of resources on LRPs for their trainings and equipments. There is also a transaction cost in terms of time and human resource of following entire process in selecting and training women LRPs. Due to physical constraints in dealing with large sized animals and sometimes their violent behavior, women face problems in ear-tagging. In few instances (such as Maahi), one LRP was given the responsibility to cater two villages until the EIA recruits enough number of LRPs in order to maintain the 'one LRP per village' norm. In such cases, women LRPs find it difficult to cover two villages.

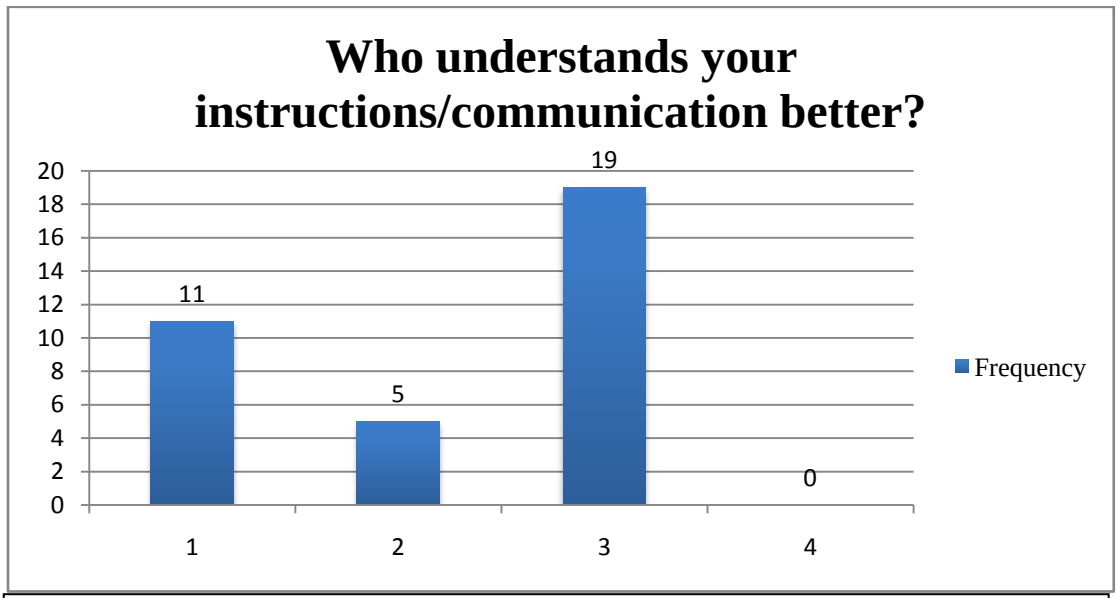
EIAs are also striving to get female Mobile Artificial Insemination Technician (MAIT). Paayas is trying to recruit two to four women MAIT. But, not all EIAs are able to recruit women MAIT. There are some constraints with women MAIT as well. One MAIT has to cater to 6-7 villages. It is very difficult for a woman to cover such a large area. Families don't allow women to visit these many villages alone. They need a male member to drive them to the villages all the time.

Secondly, women are not capable enough to handle large animals while performing their duties. EIAs are trying to give them appropriate training as to how to handle large animals. In order to recruit women MAITs, Maahi has relaxed security free of Rs. 10000 for women. They have also reduced the area of operation for women from 6-7 villages to 3-4 villages.

Banas, after much efforts, have recruited one women milk recorder. Milk recorders measure and record sample of milk of selected animals in PT and PS sub-projects. He/she is also required to spend a lot of time in making field visits.

In VBMPS sub-projects, EIAs have the target to appoint lady extension officers. One lady extension officer takes care of about 30 DCS, though this number varies across EIAs. The salary of lady extension officer is provided under NDP-I. Since the area of operation is very large, EIAs are not able to find appropriate women candidates for this post. Also, the salary provided for this post (Rs. 15000/month) was reported to be not sufficiently lucrative given the effort required.

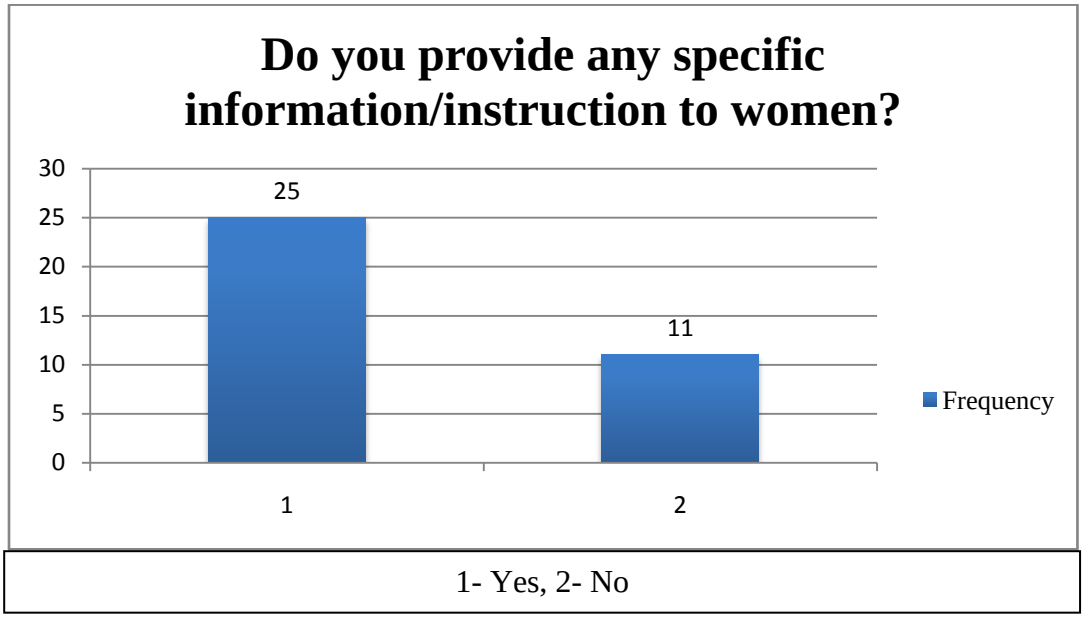
Figure 6.2: Assimilation of Information



1- Male, 2- Female, 3 – Both

Having women project functionaries is an important strategy to reach out to more number of women. Women LRPs easily enter the house and talk to women about balanced ration. This also increases women participation as women dairy farmers feel comfortable talking to women project functionaries. The project functionary survey indicates that both male and female understand the instructions given by them. Project functionaries also tend to provide specific guidelines to women as they mostly look after the dairying (Figure 6.3).

Figure 6.3: Provision of Information for Women



6.5 Trainings and Capacity Building

EIAs are giving appreciable attention to training and capacity building of project functionaries. It is justifiable; as large numbers of new positions have been introduced under NDP-I. In addition to that EIAs are trying to induct women in these positions. Therefore, appropriate skills have to be developed. These trainings consist of classroom and fieldwork sessions. The trainings on

following programs are being given: silage, clean milk production, VBMPS, RBP, fodder development, progeny testing, etc. These training programs are organized at NDDB and at the EIA premises. EIA officials acknowledged that trainings given by the NDDB do have specific instructions for women empowerment and for increasing women participation. NDDB also organizes trainings of the trainers (ToTs) in order to enhance relevant skills of the trainers and sensitize them about the various aspects of NDP-I. A survey of DCS functionaries conducted by the study team in 48 DCS indicates that functionaries in 40 DCS have received some training under NDP-I. The survey indicates following trainings received by the DCS functionaries:

1. Health and nutrition requirement of animals
2. Milk procurement and cleanliness
3. AI and RBP training
4. Basic secretarial training
5. Animal feed related training
6. CMP
7. Quality control of milk
8. Data management
9. Computer training
10. Accounting
11. BMC

Few orientation and awareness programs have also been organized at the DCS level which aims to improve knowledge and skills of participants. One such program is FOP. In FOP, women understand about producing clean milk and its value. At the DCS level, CMP/MCMT programs

are also organized. DCS have reported significant benefits from trainings offered under NDP-I. Followings benefits were mentioned by DCS:

- Learned accounting and management of DCS
- Learned milk collection process
- Awareness about animal feed
- How to increase milk production
- Learned about government schemes
- How to increase membership
- Quality management and quality control at the DCS
- Improved healthcare of livestock
- Improved income for members

Only few women from selected DCS are sent for these trainings. The number of such trainings for DCS women members is very less. As a result, the participation from women remains less. In DCS functionary survey, 29 out of 48 DCS reported that participation of women in trainings at the DCS level was either minimal or absent.

Table 6.2: Women participation in dairy training

	Question asked to women	**Percentage of NDP Households**
1	Participation in dairy training	18.36
2	How many women understood what was discussed in dairy training	7.36

	Question asked to women	Percentage of NDP Households
3	How many women discussed/ asked questions in dairy training	4.38
4	How many found timing to be suitable for dairy training	12

Source: Author Survey

Table 6.2 reflects participation of women in any kind of dairy training. It is important to note that women could not understand much what was being taught to them during the trainings. Women were also not able to discuss or ask questions. This happens because of the complex contents of the training as well as the pedagogy. The training modules remain same for all EIAs and DCS, despite extensive variations in geography, culture, society and language. In order to make these trainings effective, pedagogy should be informed about above mentioned variations and should be integrated with local examples, anecdotes and cultural practices. More emphasis should be given to contents and pedagogy of these trainings, so that women members can understand the content as well as relevance of the training. Usually trainings are organized at centralized places and women from all over EIA have to reach and stay there. Many trainings (MAIT & LRPs) last for several days. Women cannot afford living away from their homes for so long. Therefore, participation from women members remains low. These trainings must be organized at a place that is convenient to women.

6.6 Advisory services to women farmers

Major advisory services provided to women farmers are as follows:

1. Ration Balancing and nutritional services,
2. Veterinary services and

3. AI services.

Advisory services are also available to produce clean milk and management of cattle. LRP visits each household every month and suggests proper fodder and nutritional intake for animals. Then Veterinary Doctor supervises the health of the animals. LRP also keeps tab on increase in fat, and increase in milk production.

Table 6.3: Access to Advisory Services by women in NDP & Non-NDP Households

	Non-NDP Women		NDP Women	
Frequency of access	**Frequency**	**%**	**Frequency**	**%**
Vet Services				
0	354	28.42	288	23.82
1	217	17.87	248	20.51
2	365	30.07	454	37.55
3	153	12.60	122	10.09
4	70	5.77	53	4.38
5	29	2.39	14	1.15
AI Services				
0	513	42.26	468	38.71
1	325	26.77	339	28.04
2	227	18.70	260	21.51
3	82	6.75	85	7.03
4	38	3.13	28	2.32
5	14	1.15	18	1.49
Nutrition and animal feed Services				
0	639	52.64	647	53.52
1	179	14.64	217	17.95
2	150	12.36	173	14.31
3	62	5.11	55	4.55
4	15	1.24	8	0.66
5	13	1.07	11	0.91

Table 6.3 indicates that access to advisory services has improved in households that are associated with NDP-I as compared to non-NDP households. Among the extension services mentioned in table 6.3, veterinary services are the most accessed services by both NDP-I and Non-NDP households. Nutrition services are least accessed services by the NDP and non-NDP households. The possible explanation for these results could be that veterinary services have been provided by EIAs through non-NDP interventions as well. However, nutritional services are being offered only under NDP-I (RBP). Secondly, in NDP-I households, the health of milch animals under RBP has improved and frequency of accessing vet services has reduced.

6.7 Information Network for Animal Productivity & Health (INAPH)

INAPH is an IT application that captures real time data on breeding, nutrition and animal health. LRPs are given a laptop (Netbook) to keep record of the data. In RBP, milch animals are being registered in the name of women members of the family. There are no other formal ways to determine ownership of animals. In this case, notional ownership always remains with the head of the household, who is usually male. Therefore, INAPH enabled registration process, facilitates the transfer of ownership of milch animals from male to women members of the family.

INAPH also serves as an important tool for monitoring progress of RBP. LRP is supposed to make daily entry in the software about his/her visits to households and prescription that he/she has suggested. He/she also records the changes in milk productivity and cost of cattle feed, etc. Although RBP guidelines do not ask LRPs to make daily entry of the data, they are advised to do so by the EIA officials in order to get updated data. However, this does not happen all the times

because of frequent failure or unavailability of internet network. Sometimes LRPs make offline entry of RBP data. The data is synchronized whenever access to internet services is available next time. In Ludhiana, EIA has asked LRPs or technical officers to go to a nearby city and synchronize the data with the INAPH server. This involves a transaction cost for the EIA as well as the LRP. This issue can probably be solved by providing high speed internet plans to LRPs. The EIA officials reported that required steps are being taken to solve this problem.

6.8 Discussion on women empowerment in meetings with NDDB and at the EIA level

Study team also attempted to understand how women issues are discussed in EIA meetings with NDDB. EIA officials acknowledged that discussion on women empowerment in dairy does take place in the review meetings with NDDB. Major issues discussed in the meetings are following: increasing new women members, formation of new women DCS, active involvement of women in dairy, women LRP, trainings, etc. Similarly, EIAs also review the progress of women related project targets and discuss problems faced in achieving the targets. Project functionaries report monthly progress and appraise EIA officials about issues and challenges. However, discussion in these meetings is limited to the progress on different targets, rather than women empowerment related issues. This happens because EIAs are giving more attention to the targets set under NDP-I and related KPIs that can be achieved in a time bound fashion and can show their progress rather than pondering over the qualitative changes regarding women empowerment that may take long to be realized. Although anecdotal references are made in these discussions regarding the successes and failures of EIA efforts, there is no formal format for recording positive changes, stories of success, stories of failure, persistent problems, etc. Reporting from

the project functionaries should not only be in the form of number but also in the form of cases, so that learning can be replicated to other places for better results.

To conclude, it is acknowledged that NDP-I has made significant headway towards empowering women, even though many challenges still remain unaddressed. As it has been observed widely that EIA functionaries are finding it very hard to convince women to enroll with the DCS, EIAs can plan to utilize available social capital in the villages in the form of existing SHGs and other groups. To ensure sustainability in the post-NDP phase, convergence with other government and non-government public programs may become an important part of the strategy.

7. Perceptions of Stakeholders, Impacts and Recommendations

The study team tried to understand the perceptions of different stakeholder regarding the impact of NDP-I on women empowerment. These perceptions have been gathered through FGDs with women dairy farmers and semi-structured and in-depth interviews with EIAs and other stakeholders, such as Panchayati Raj Institutions (PRIs). These perceptions reflect the experiences of different stakeholders regarding the impact of NDP-I on day to day life of women dairy farmers and whether these impacts are leading towards social, economic and cultural empowerment of women engaged in dairying.

7.1 Perceptions of women dairy farmers

Women were asked about their understanding on different aspects of dairying and NDP activities. These aspects are following: 1) Perception about dairy, 2) Decisions regarding day-to-day dairy activities, 3) Going out of the house and talking to villagers regarding dairy activities, 4) Use of dairy income, 5) Decision regarding the use of dairy income, 6) Issues/problems faced in carrying out dairy related activities, and 7) Participation in non-dairy public activities. Below In the following section, each of these aspects will be discussed.

1. Perception about dairy: Women consider dairying as a source of additional income. In most cases, primary income is either agriculture income or some small-scale enterprise. For few women, dairying is a primary source of income. This is found in those households which do not have any other source of adequate income. Few women find dairying as a part of their

responsibility towards other members of the family. Some women consider dairying as an opportunity where they can contribute to the well-being of their family.

2. Decisions regarding day-to-day dairy activities: Majority of the women acknowledged that they are independent in taking day-to-day decisions regarding dairying. Male members do not interfere. However, in some cases, women responded that such decisions are being taken by both male and female members of the family. Few women also said that they are empowered enough take these decisions independently. Male members never dictate as to what is to be done with regards to dairying.

3. Whether women go out of the house and talk to villagers regarding dairying: As women enjoy independence on taking day-to-day dairy related decisions in the family, they also enjoy freedom of going out of the house and participate in dairy activities. Usually, women discuss dairy related concerns in their peer groups. Some women said that they discuss dairy related matters with male members of the village without any hesitation. The discussion takes place around common issues of dairying such as managing milch animals (fodder, nutrition, cleanliness, etc.), how to increase milk productivity, health of the animal, etc.

4. Use of dairy income: With respect to the use of dairy income, women responded that it is usually spent on fulfilling common needs of the family. A part of this income is spent on purchasing fodder, nutrients and minerals. Majority of women reported that this income is also used in covering educational expenses of their children as well health related expenses of elderly members of the family. In short, the income is spent on productive works.

5. Decision regarding the use of dairy income: With regard to taking decision regarding the use of dairy income, in general, women alone do not take such decisions. The decisions of spending dairy income are taken either by the family head/husband. In very few cases, women reported that such decisions are taken by both, women and male members of the household. Evidence does not suggest that women are independent enough to take decisions on the use of dairy income. Decisions taken regarding the use of income is traditionally a male's domain. Since dairy income is an important source of family income, involvement of male members becomes inherent.

6. Issues/problems faced in carrying dairy related activities: Issues that women face in dairying are primarily about managing animals. Following are the issues that women face:

- Frequent issues with animals' health
- Cleaning of animals and animals' sheds
- Lack of green fodder
- Overlapping of household related work and dairying related responsibilities

7. Participation in non-dairy public activities: As discussed earlier, women's participation in dairying related activity is quite high. But women do not participate in non-dairying activities outside the house. These public activities include participating in public discussions, processions, public meetings, etc. This situation is more about choice than compulsion. Women do not participate in public activities because they do not want to do so as they have to perform household duties including dairying. Women say that participation in public activities is men's responsibility as we are engaged in many other things inside the house. Therefore, women do not

go out for non-dairy related public activities, is not an indicator of disempowerment in this context.

7.2 Perceptions from EIAs

EIAs' perception regarding women empowerment varies across the regions. EIAs in Eastern and Western India are more hopeful and positive about NDP's potential to empower women economically and socially. Consequently, EIAs in Gujarat, Rajasthan and Odisha have witnessed increased women participation in dairying, independent from the influence of male members of the family. Women are participating directly in income generating activities and are receiving the economic returns. These returns are contributing not only to women's self-dependence but also to the overall well-being of the family, which ultimately strengthens women's space in the family.

EIAs in North India are of the opinion that it might take bit longer to observe empowerment impacts of the program. According to an EIA official located in the Northern part of the country, "*Women in dairying are doing better. But they need support from their husband/son in payments, withdrawal or in other activities. Male members keep this money with them. Men are keeping hold on many activities in the name of women*". Despite these challenges, EIA officials are hopeful of better results through NDP.

7.3 Perceptions of PRIs

Study team interacted informally with PRI members of eight villages covered during the study. While PRI members frankly accepted the increasing role of women in dairying, they do not see

any significant change in their social or economic status as of now. According to them, probably, it is quite early to see any significant change. The process might take years to change the perceptions towards women. Few PRI members argued that dairying was always present in the society but they didn't see substantial changes brought by dairying in women's lives.

The perception of PRI members perhaps indicate that the process of empowerment might take bit longer as NDP-I has been around for two years only. More positive results are expected to be achieved if the program goes on for a longer period. The perception of the society towards women in dairy is expected catalyze through women project functionaries including lady extension officers, lady LRPs, MAITs and route supervisors in the field and the success of training and awareness programs for women.

7.4 Few qualitative observations regarding the impact of NDP-I

- BMCs established under VBMPS lend flexibility to women in scheduling their morning activities as they get at least two hours long window within which they can go and pour the milk. This was not the case with the CAN system or private milk buyers.
- In most DCSs, women now get computerized slip of sold milk. Their names are printed on the receipts along with the amount of milk and price. As a result they can realize their ownership. Earlier when the cash was distributed, men used to collect the cash.
- EIAs have reported that NDP-I has made union officers and project functionaries more responsible. Since NDP-I binds them to time-sensitive deliverables, project functionaries are trying to achieve them with greater efforts.

- As dairy is becoming a major source of income generation activity, social groups that were traditionally away from dairying are opting for it. An appropriate example is the involvement of Rajputs in Rajasthan and upper castes in UP. Although, upper castes in UP have been involved in dairying for a very long period of time, but they hardly sold the milk. Now upper castes are increasingly opting dairy as a business venture.
- People have established their trust on dairy as a potential livelihood option. People are taking loans from the banks and starting dairy activities. They are able to repay their loans and meet living of the family using dairy income.

7.5 Recommendations

- New membership drives should be (re)launched in women DCSs to attract more women members after one and two years of their formation.
- Gram Sabhas can be used for organizing awareness programs. This can be used as a platform to sensitize mobilized members, including women about dairying and related benefits.
- A group of active women members can be formed in each DCS to attract new women members. This group can also work as support mechanism for new women members. Such women can also work as Master Mobilizers and their services can be used at other DCS.
- Cross learning through exposure visits of DCS members to other DCS should be organized

- Integration of human & social capital - linking existing SHGs with NDP-I can be explored. This may be helpful in lowering down the financial burden on EIAs and ensuring sustainability of the NDP-I initiatives.
- A sub project plan must include a defined set of women empowerment indicators, which should be beyond enrollment and participation of women.
- Effective IEC tools for information dissemination between EIA and DCS should be worked out. Currently, it seems ad-hoc, mainly depends on zonal and technical officers.
- Venue and time for trainings should be more sensitively selected and finalized, especially when participants are women.
- Innovative IEC tools to be developed for awareness of stakeholders like farmers, women groups, LRPs, etc. Contents of the trainings should be simple, using local language, citing examples from the local context. Audio-videos, flip charts, street shows, etc. to be used for training.
- Sessions on gender, gender roles, etc. be included in the training.

8. Conclusion

This study provides an account of mid-term performance of the NDP-I on empowering women in terms of increasing women's participation and their role in decision making in dairying. There was a statistically significant difference in Women Empowerment in Dairy Index (WEDI) between NDP and non-NDP households. Among individual EIAs, there was no significant difference in gender empowerment between NDP and non-NDP villages. Only in the EIA Paayas there was a significant difference between NDP and non-NDP households.

The highest WEDI was seen in the EIA Cuttack, Odisha at 0.87, while the lowest WEDI was seen in Maahi, Gujarat at 0.48. Gender empowerment is influenced by prior conditions of the households and the development of the village or region. This is particularly true as the NDP program has only been rolled out in the past few years. Hence we would like to first categorize the EIA households by their physical and human resources.

The households were categorized as well to do by their mean income, average size of land and average number of milch animal owned. Whether the house was fully kachcha (not made of brick and mortar) proved a good proxy for the physical condition of the house. By these indicators of physical resources, the households in Punjab were found to be most well to do, followed by Banas in Gujarat. The poorest households were in Cuttack, Komul and Manmul, and Lucknow, in that order. The households in Rajasthan and Maahi, Gujarat were categorized as middle income households.

Among other social and human resources, the level of education was an influential variable. The well-to do households in Punjab had the highest years of education, i.e. about eight years, and there was no difference by gender. The poor households in Karnataka had high rates of illiteracy. However, Cuttack had very low illiteracy and about 50 per cent of the women had primary education. This fact alone seemed to affect the high gender empowerment observed in this EIA. Maahi, was a middle income EIA with high illiteracy ascribed to the traditional culture of that region, Suarashstra.

Besides, education, the high WEDI in Cuttack was ascribed to exogenous conditions. Cuttack and Odisha in general had a powerful self help group (SHG) movement for more than a decade. This we also noted in the high level of group membership other than in dairy among women in this EIA. Thus women empowerment in Cuttack, in otherwise poorly endowed households was attributed to external initial conditions of the region and relatively higher level of education and group membership among women in the households.

Support through NDP-I provides an opportunity to strengthen the interaction between EIAs and DCS as well as with the society. NDP-I has provided EIAs some targets in terms of establishing new women DCS as well as increasing women membership in new and existing DCS. The study team observed that the formation of women DCS under NDP-I varies from 22 per cent to 50 per cent across all 10 EIAs. Similarly, in terms of enrolling new women members in new and existing DCS, achievements varies from 30 per cent to 50 per cent across EIAs. Most of the EIAs either have achieved the targets or are closer to achieving it. EIAs acknowledge the effectiveness of training support provided under NDP in forming women DCS. The revised

target of women enrollment in a typical DCS is now 50 per cent. Most of the EIAs are progressing well in order to achieve the new target. However, the pace of enrolling women in DCS in Northern states (Punjab & UP) is comparatively slow.

The emphasis of NDP-I is not only enrollment, but also on women's participation in EIA and DCS level activities. EIAs are setting their targets to increase the participation as well. The programs like VAPs, FOPs & Calf rallies have been effective in attracting the participation of women from lower castes and marginal farmers' households. EIAs are also encouraging and facilitating women to open their bank accounts, so that they have access to dairy income. ATM cards are also being issued to women account holders in order to facilitate easy access to money. In many DCS, women now get computerized slip of the price of the milk. As a result they can realize the return of their hard work. Earlier when cash was distributed, men used to collect the cash and had control over the milk income.

NDP-I also encourages EIAs to provide women representation in governing bodies and committees at the EIA as well as DCS level. The study observes that all EIAs have reserved 2-3 positions for women in the governing body. However, in few women DCS, leadership positions have been given to male members. The logic behind this development is that DCS needs active and educated persons to hold such posts as Secretary and President as these positions are crucial in order to strengthen the organization. It is difficult to get active and adequately educated women for these positions. However, EIAs are confident that in coming time, women will be able to hold these positions effectively.

NDP-I is also trying to recruit women as project functionaries at EIA and DCS level. All EIAs, except Ropar and Ludhiana, have recruited women LRPs. Though the total number of women LRPs is very less than male LRPs, EIAs intend to balance this ratio. Other positions for women as project functionaries include Milk Recorder, MAIT, Technical Officers, Zonal Officers, trainers and educators, etc. Despite the efforts from EIAs to recruit women in various project positions, there are some practical difficulties with women project functionaries, especially LRPs and MAITs. For example, women do not have physical abilities to handle large animals during ear tagging and providing AI services, and find difficult in covering vast geographical area to provide the services. Women also face family related constraints. In traditional societies, daughter-in-laws are rarely allowed to work outside the home and daughters usually leave the job soon after their marriage. Because of these issues EIAs are not able to retain women project functionaries for longer period. In order to encourage women for project functionary positions, few EIAs are relaxing work norms for women.

In terms of trainings and capacity building, more focus is being given on capacity building of project functionaries. This makes sense as project is in initial phase of implementation and project functionaries need to be trained properly in order to realize the desired goals. Though the participation of women project functionaries in the trainings has increased over time, women find difficult to participate in NDP related trainings. Mostly trainings are organized at a centralized place and women from all EIAs have to reach and stay there. Few training (MAIT & LRPs) last for many days and women cannot afford living away from their homes so long. Secondly, women also find difficult to understand what has been discussed in these trainings and

how these things are important for their day to day dairy related works. The content and pedagogy must be simplified in order to make these trainings fruitful to women.

INAPH records the registration of milch animals and EIAs are registering the milch animals preferably in the names of women. Therefore, INAPH has facilitated the ownership of milch animals from male to female members of the family. The main issue that this system is facing is the failure or unavailability of internet network in rural areas. More often, LRPs have to make offline data entry and synchronize the data when they get network connectivity after sometime or at a different place. Sometime, data is sent to EIA where Technical Officer or other officers have to update the data in the software. The monitoring at the EIA level is usually done through review meetings organized once in a month. In these meetings, EIAs review the progress of women related project targets and discuss the problems faced in achieving these targets. However, discussion on women empowerment in these meetings is not a regular feature. No formal format is used for recording the positive changes, stories of success and failure, examples of persistent problems, etc. Absence of these elements in the review process hampers the opportunities of replication of learning within the EIA as well as across the EIAs.

Dairying has emerged as an important source of income for women, though it is still considered as a secondary source. In the cases, where a family doesn't own land and is dependent on labor work for its subsistence, dairying has become primary source of income for them. Women also see dairying as their responsibility as well as an opportunity for them. It has been observed that women are independent in taking day-to-day decisions regarding dairying. Women also go out of the home and talk to people about various issues pertaining to dairy. These issues include:

common issues regarding managing cattle (fodder, nutrition, cleanliness); how to increase milk productivity; health of the cattle, etc. The income earned through dairying is being used to fulfill household related needs and a part of it is spent on children's education and health related needs. Although it is important to note that decision regarding the use of dairy income does not rest solely with women, the study finds that women along with male members of the family decide about the use of the dairy income.

Dairying has established a trust among women as a reliable source of livelihoods. The case studies suggest that women in various instances borrowed money from their relatives and friends and were able to repay the loan using dairy income. Usually, family members don't allow women to work outside the house. Women took dairying as a solution as they don't have to step out for the work.

It has been observed through case studies that when women enroll with DCS and get benefited by any one of the NDP initiatives, number of milch cattle in that household increases over time. Women enrolling with DCS have also resulted into greater participation of women in the meetings, trainings and discussions. The study observes that enrolling with DCS encourages the household to take benefits of NDP services. Evidences gathered through cases suggest that significant changes have been observed in those households where they are associated with either VBMPS or RBP. BMCs established under VBMPS lends flexibility to women in scheduling their morning activities as they get at least two hours window within which they can go and pour the milk. Earlier when milk was collected in cans or was sold to private buyers,

women had to follow a strict schedule every day and that had an adverse impact on their leisure and other household related responsibilities.

Among other significant effects of NDP-I, it was observed that as dairy is becoming an important source of income; the social groups that were traditionally away from dairying are opting for it. This is being seen in case of *Rajputs* in Rajasthan and upper castes groups in Northern parts of the country. In another instance, EIAs have reported that because of the NDP-I, their officials are becoming more professional and responsible. NDP-I has set various targets to be achieved within the stipulated time frame and lays down specific procedures and guidelines for compliance. This puts a significant pressure on EIAs and its functionaries; as a result officials strive to achieve these targets within the time-limits available to them.

8.1 Policy Implications

The study concludes with the submission that the mid-term impact assessment has found strong and robust evidences that NDP-I has significantly influenced the social status of women in dairy households. Empirical evidence indicates that dairying provides substantial opportunities of decision making for women within and outside the household which contribute to their economic and social empowerment. Therefore the future programs on dairying should explicitly include women inclusion components in the design itself. All such programs must have a clear program theory and logical frame as well as relevant indicators to measure and track women inclusion and empowerment. NDDB / Government can also plan to develop a results-based monitoring system for dairying related programs where progress on women related components can be the part of results based performance review. The policy makers can also device a system where dairy

unions/producer companies that are performing better on women's inclusion front are incentivized differently. In fact the NDP-I effects can be magnified further with sharper program targeting, improved training facilities, material, and timing; and greater emphasis on connecting women with formal dairy supply chains. Program managers must not only identify various ways in which such programs can improve the socio-economic status of dairy women, but also appreciate that strategic inclusion of women in the program has the potential to improve the outcomes and impacts of the program itself.

8.2 Study Limitations

The implementation of different components of NDP-I in selected EIAs largely started during 2012-13. The survey instruments for data collection were canvassed during April- June 2015. Therefore the study at best could account for only two years of the program implementation. In such a short span of time, the social structures that may mediate women empowerment effects may not change significantly. The study used best available methods to account for endogenous relationship that are usually associated with such programs; it cannot match the rigor of randomized experiments at least in terms of internal validity. The selection of treatment and control group households was entirely random in the absence of listing survey. It is recommended that there should be provision of resources for such activities.

Majority of such maladies can be effectively dealt with the use of panel data models as it accounts for time-invariant latent household level characteristics. This exercise can be effectively executed as the identifier information at the village and household levels has been properly captured.

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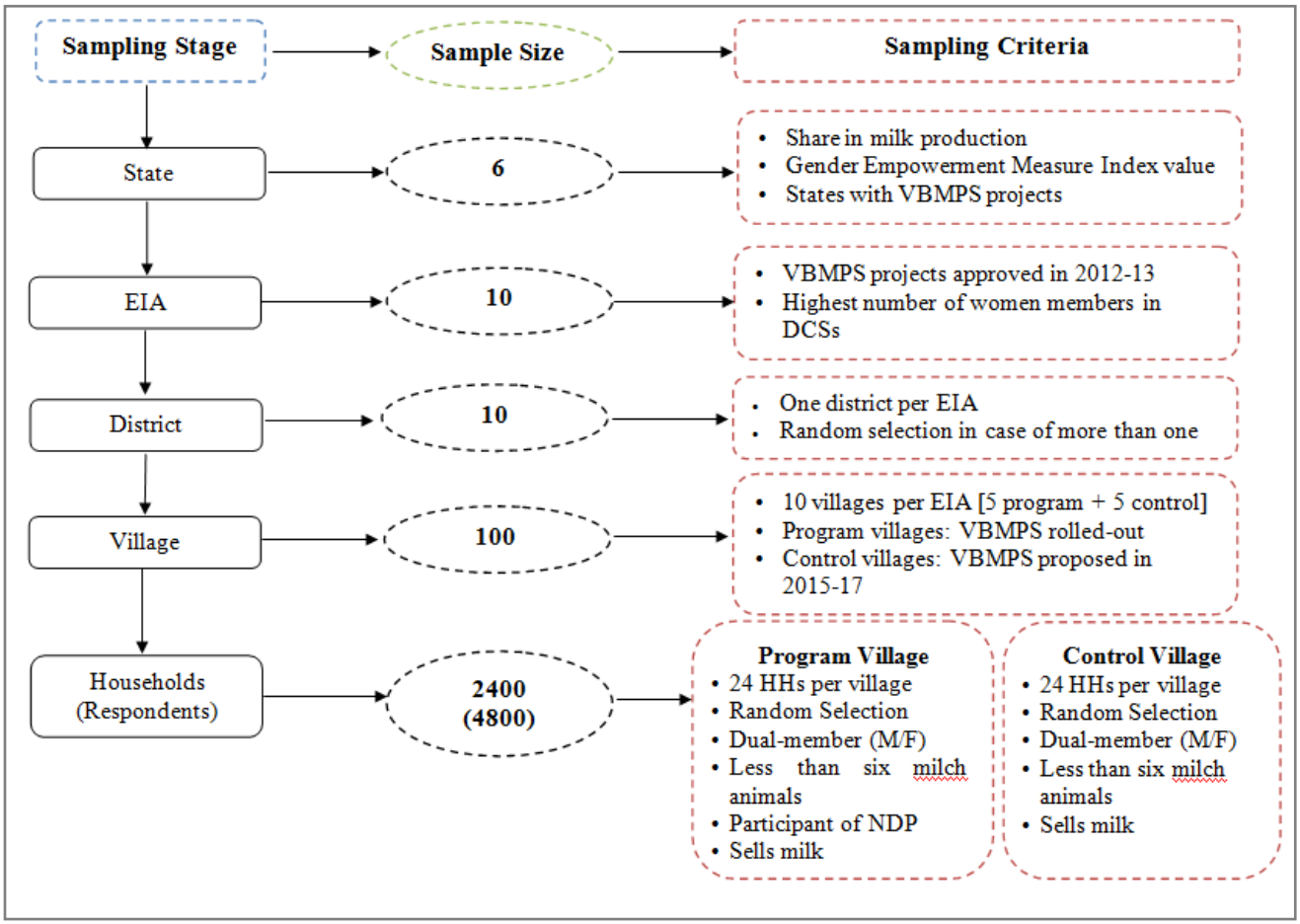
ANNEXURES

(Annexure 1 through Annexure 5)

Annexure 1: Sampling Process



Annexure 2: State Selection

State	% Production		Production	EIAs with VBMPS Project	1-GEM	Final Score	Ranks	Regional Coverage	S	E	N	W	Selected States (From each regional cluster)
Bihar	5	M	2	6	621	213.78	1	N			Bi-1		Between Bihar and UP, UP is selected because of the highest milk production
Odisha	1	L	1	5	607	208.36	2	E		Od-2			
West Bengal	4	L	1	4	565	193.75	3	E		WB-3			
Rajasthan	8	H	3	9	558	193.68	4	W				Raj-4	
Uttar Pradesh	18	H	3	10	548	190.61	5	N			UP-5		
Madhya Pradesh	6	M	2	2	537	183.9	6	W				MP-6	
Gujarat	8	H	3	8	515	178.73	7	W				Guj-7	Purposive selection because only other state with producer company
Tamil Nadu	5	M	2	3	502	172.33	8	S	TN-8				No VBMPS projects in 2012-13
Maharashtra	7	M	2	14	484	169.84	9	W				Mah-9	
Punjab	8	H	3	5	486	167.88	10	N			Pu-10		
Karnataka	4	L	1	11	474	165.12	11	S	Kar-11				
Kerala	2	L	1	3	475	162.82	12	S	Ker-12				No VBMPS projects in 2012-13
Haryana	5	M	2	5	468	161.43	13	N			Har-13		
Andhra Pradesh	9	H	3	5	453	156.66	14	S	AP-14				

Annexure 3: EIA Selection Details

State	EIAs with VBMPS 2012-13	Total Villages under EIA	Total Members	Women Members	Selection Remarks	District Selected
Gujarat*	Banas				Selected. New milk union offers better chances of impact detection	NA
	Sabarkantha	379	2386	716	Not selected as desired number of EIAs identified	NA
	Mahi Producer Cooperative	3160	128590	19289	Producer company purposively selected.	Bhavnagar
Rajasthan	Bhilwara	284	8730	2619	Selected. Only EIA with VBMPS	Bhilwara
	Paayas Producer Cooperative	2716 (to be covered by 2016-17)	65649	22321	Producer company purposively selected.	Jaipur
Punjab	Ropar	101	3006	900	Selected. Only 2 EIAs with VBMPS	Ropar
	Ludhiana	210	5003	NA	Selected. Only 2 EIAs with VBMPS	Ludhiana
Uttar Pradesh	Lucknow	91	4688	1406	Selected. Only EIA with VBMPS	Lucknow
Odisha	Cuttack	404	3511	1069	Selected. Only EIA with VBMPS and sufficient number of women members	Jagatsinghpur
	Samleshwari	50	320	96	Not selected as this EIA has only a small number of women members	NA
Karnataka	Kolar	480	10344	3103	Selected. Two EIAs with the highest number of women members selected.	Kolar
	Mysore	634	14483	4345	Not Selected.	NA
	Bamul	320	8904	2671	Not selected. Two EIAs with the highest number of women members selected.	NA
	Hassan	421	7985	2396	Not selected. Two EIAs with the highest number of women members selected.	NA
	Mandya	754	21173	18812	Selected. Two EIAs with the highest number of women members selected.	Mandya
	Tumkur	265	8583	2575	Not selected. Two EIAs with the highest number of women members selected.	NA

Annexure 4: Case Study Analysis

A Brief Analysis of NDP-I Case Studies

Case study is a method to get in-depth information in the real life context. This method helps in understanding the possible areas of the impact of an intervention on the lives of the targeted groups/beneficiaries. The Government of India in March 2012 approved the implementation of NDP-I, with that various components of NDP-I started at different times in various places. In the sample villages; some of the components of NDP-I started in 2013 and some started in 2014. The data for this study was collected during April-June, 2015 post-mid 2015. which gave it insufficient time to capture the the impact of the NDP on women dairy farmers. Therefore, cases collected from these places provide certain feelers of the possible impacts of NDP-I on women empowerment. This chapter provides an analysis of the 48 case studies carried out in 50 intervention villages covered under this study.

Dairy as a major source of income

It is fairly evident from the cases that dairy has become a major source of income for rural households. In the majority of cases, the income coming from agriculture related activities is regarded as primary income, whereas dairy has emerged as a secondary source of income. More often, income generated from agriculture is found to be inadequate in sustaining household's requirements. Such households opted for dairy as an additional source of income. In the cases where people are involved in agriculture related labour, dairy has emerged as a primary income generating activity. In these households, women are having stronger say in the spending of dairy income as women take charge of day-to-day dairy activity. The size of the households that represent the success story of the NDP-I is usually large (5-7 members). This probably also

explains why agriculture income could not be found enough to meet household's needs. However, the nature of the family does not seem to have any relationship with the dairy activity. The case studies suggest that both, joint and nuclear, types of families are participating in dairying and observing similar impacts.

Use of dairy income for social development

Though it is early to determine the impact of dairy income on social development of the family and women, the observations coming through the case studies indicate that additional income coming from dairying is being spent on children's education and health related needs. There are several instances where dairy income has been used to cover health related expenses of elderly members of the family. In many instances, family borrowed money from their relatives to take care of the health or/and educational expenses, their involvement in dairying helped them repay the loans and achieve financial self-sufficiency. Women also reported that a portion of dairy income is being spent on fulfilling other needs of the household.

Access to household income and participation in dairy related public activities

The cases studies indicate that dairying is providing an employment opportunity for women without requiring them to step out of their homes. Generally, it is found that male members of the family do not allow women to go out and work. This phenomenon is very much evident in northern parts of the country. Dairying has emerged as a solution to this barrier. While taking care of milch animal, women can also take care of household related responsibilities without creating any confrontation with the male members of the family.

It is also quite evident that once a women enrolls with the DCS and has access to NDP-I services, the number of milch milch animal in the family increases overtime. In some instances, milch milch animal were bought while availing loans from relatives and friends. Dairy enables them to repay the loans and increase the number of milch animal. This trend reflects the economic benefits that dairying provides to women. The cases also exhibit that once a woman enrolls with DCS, her presence in dairy related activities increases. Women DCS members are participating in DCS meetings, awareness programs and various awareness sessions programs more than what they used to participate when they were not associated with the DCS and NDP-I formally.

Significance of various NDP components in the empowerment of women

In terms of the impact of various components of NDP-I on women, VBMPS and RBP are providing more space as well as opportunities for women to engage with the dairying as well as enhance their economic and social status. In most of the cases where dairying is making positive effects on income and the other aspects of women's lives, household is either associated with VBMPS or RBP. In few cases, where positive effects of dairying are visible, households have subscribed for AI services. The cases reflect that women's conditions have improved within the household after women enroll themselves with DCS. Women are able to access the support system and services, which NDP-I offers through DCS, which in turn help women to enhance their dairy business as well as improve her social interaction with the people outside the family.

The changes observed through the cases exist across the different states. Though social and cultural barriers for women vary across the states and regions, the cases do not throw any specific pattern associated with geography, region or state. The case studies provide a significant

account of the initial success of NDP-I in promoting women empowerment through dairying. More clearer and mature impact would show up after the end of the first phase of NDP-I.

Annexure 5: Compiled Case Study

Case Study: 1

Sitaben - Ambetha, Palanpur (Banaskantha)

EIA Name – Banas

Enrolled under DCS – Ambetha

Background

Sitaben, aged 37, lives in Ambetha village and is associated with the Banas dairy. She lives in a joint family of seven members – Sitaben, her husband, mother-in-law, father-in-law and three children. Sitaben and her husband are the only working members of the family.

Problems Faced

Through the discussion with other women of the village, Sitaben became aware of the awareness program that was being conducted by the dairy staff to educate people about the methods and techniques to ensure higher productivity in milch animal. However, her husband did not allow her to attend any such meetings.

After observing a positive impact of the awareness sessions on the productivity for other people in the village, Sitaben convinced her husband to let her attend these programs conducted on dairying.

Impact of Dairy Cooperative Society

Sitaben attended awareness session on RBP. In these sessions, she learnt about new ways of feeding the animals and about the proper nutritious food. She applied what she had learned from the LRP, thereby increasing the quality and quantity of the milk produced.

Through awareness on Artificial Insemination (AI), the villagers realized that the quality of animal can be improved through cross-breeding. Initially, Sitaben's family was apprehensive about this technology and was reluctant to adopt it; however, she successfully convinced them to try this for their own animals.

Current Scenario

Consequently, after adopting AI (Artificial Insemination) and other methods of feeding & taking care of the milch animal, Sitaben's family witnessed an increase in milk production along with the improvement in the quality of the milk as well as in the health of the milch animals. Owing to these improvements, Sitaben and her family were able to save more and thus pay off previous debts and plan a better future.

Case Study: 2

Sarojben - Malosana, Palanpur(Banaskantha)

EIA Name –Banas

Enrolled under DCS – Malosana

Background

Sarojben, aged 32, of Malosana village lives with nine other family members. Five of these house members are involved in agricultural and dairying activities.

Despite five members of the households being involved in labor force, the financial status remained very weak. The family found it difficult to meet their daily needs and to send their children to school. All the financial conditions compelled her into buying a buffalo. The earnings from selling the milk produced were to be used to elevate their financial status.

Problems Faced

In order to buy a buffalo, Sarojben had taken a loan from one of her relatives. Before joining Banas dairy, Sarojben sold all of her milk produce to a private dairy. However, the owner of the private dairy used unfair practices for measuring the fat content of the milk. This malpractice led to lower earnings as against her expectation, which eventually made paying back the loan difficult for her family. Thus, even though Sarojben bought the buffalo under the perception that it will help raise the family income; unfair practices adopted by the private dairy actually reduced their earnings.

Impact of Dairy Cooperative Society

Sarojben got to know about Banas dairy from her neighbors who were selling their milk produce there instead of going to the private dairy. They informed her about the benefits of joining the dairy cooperative and encouraged her to do the same. Sarojben, together with her husband, joined Banas dairy in the hope of better results.

After joining Banas, she received information about RBP and attended awareness programs on RBP where she understood about the right kind of food that should be given to cows in order to receive maximum output. She also learnt that proper feeding improves health of the animal as well. She followed the RBP and implemented the advices given by LRP. This resulted in an improvement in the quality of milk and fat content thereby leading to increased monthly earnings.

Current Scenario

With the rise in savings, Sarojben was able to pay off her debt and send her children to school to get quality education. She firmly believes that without the help of the RBP, she would not have been able to repay the debt and would still be facing financial problems. Now Sarojben tells other people about the benefits of the program and encourages them take benefit of it.

Case Study: 3

Sitaben Chavda – Asasan, Gujarat

EIA Name – Banas

Enrolled under DCS – Asasan

Background

Sitaben Chavda, aged 33, lives in Asasan village of Banaskantha district, Gujarat with her husband, five children and her mother-in-law. Her husband is involved in agricultural activities while she focuses on dairy farming.

Problems Faced

The income earned by Sitaben's husband through agricultural activities was not sufficient to meet the expenditures of the family. Her mother-in-law was too sick to work and Sitaben spent all her time taking care of her children and her mother-in-law.

Sitaben and her husband were unable to pay for all their children's education. They took loan from their friends and relatives to pay the fee but were unable to repay the same on time.

Sitaben realized that in order to fulfill the needs of her family, she had to start working. She started helping her husband with buffaloes rearing. However, even with both of them working on

the field, Sitaben and her husband were still unable to pay for household expenditures as the milk given by buffaloes was both low in quantity and of poor quality.

Impact of Dairy Cooperative Society

Sitaben came to know about the RBP from her neighbors. After witnessing a positive impact in milk productivity, she and her husband decided to join the program. After attending awareness program at the DCS meetings and further information provided by the LRP, Sitaben became aware about the requirements of her buffaloes, the nutritious food that should be given to buffaloes and other techniques to ensure higher milk productivity.

Current Scenario

During the implementation of the RBP, Sitaben witnessed an increase in the milk productivity as well as improvement in the quality of milk. Sitaben now owns 5 buffaloes and sell 10 liters of milk every day. The family, now, has a steady source of income which has helped in improving their standard of living. Gradually, Sitaben and her husband are paying off the loan that they took to pay for their children's education. They also plan on expanding their agricultural activities in the future.

Sitaben believes that the RBP has been helpful in strengthening the financial status of her family. She had not thought of working in the past but now, she feels motivated to work in dairying and contribute to her family's earnings.

Case Study- 4

Rinaben Thakor – Durgasan, Gujarat

EIA Name – Banas

Enrolled under DCS – Durgasan

Background

Rinaben Thakor, aged 35, lives in a nuclear family with her husband, two daughters and sons in Durgasan village of Banaskantha district in Gujarat. She and her family lives in a semi pucca house without the facility of personal bathroom and toilet. Her husband works as an agricultural labor.

Problems Faced

The income generated from the agricultural activities was not sufficient to meet the requirements of the family. The additional income from dairying activities undertaken by Rinaben was also not enough as the buffaloes owned by the family did not produce milk with sufficient quality of fat content. Thus, the payment received for the produce was less.

The family was unable to fulfill daily needs. It also became difficult for Rinaben and her husband to pay fees for their children's education. They took loan from their friends and relatives to pay for the education. Rinaben learnt about the RBP through her relatives and neighbors. She consulted about this with LRP. After hearing about the positive impact of awareness sessions on their lives, she decided to join the same.

Impact of Dairy Cooperative Society

After learning about the dairy cooperative society, Rinaben started attending the meetings and discussions at the DCS. The RBP provided awareness to the villagers related to the nutrition requirements of milch animal, type, quantity & quality of food that should be given and other such dairy related awareness programs. This helped her understand the food requirements of her milch animal. Women of the village gathered and exchanged information about the practices followed by them to keep their milch animal healthy. This helped Rinaben to learn about new methods and techniques of feeding balanced ration to her animals.

Current Scenario

Presently, Rinaben owns 3 buffaloes and is highly satisfied with her work. She spends most of her day feeding the milch animal, maintaining their shed and taking care of them. She goes to the dairy once in a day to pour the milk. On average, her milch animal give 10 liters of milk per day, out of which she pours 9 liters at the dairy society. Her husband also assists her in carrying out day to day dairying activities. Rinaben and her husband are now able to provide quality education to their children and have also paid off the debt they had taken to pay for their children's education.

Case Study- 5

Samadaben Patel – Kunvata, Gujarat

EIA Name – Banas

Enrolled under DCS – Kunvata

Background

Samadaben Patel, aged 43, belongs to Kunvata village of Banaskantha district, Gujarat. She lives with her husband, three daughters and a son. Her husband works as an agricultural labor but that does not ensure a steady supply of income every month. Samadaben is engaged in dairy farming. Her eldest daughter assists her in carrying milk to the dairy and in keeping the shed clean.

Problems Faced

The income generated from the agricultural activities was never sufficient to meet the requirements of the family. The additional income from dairying activities undertaken by Samadaben was also inadequate as the buffaloes owned by the family did not produce sufficient quantity of milk.

It became difficult for Samadaben and her husband to pay fees for their children's education. They were also unable to pay for the daily requirements of their family.

Impact of Dairy Cooperative Society

Samadaben became aware about the Ration Balancing Program (RBP) and the knowledge provided under the Program through her relatives and neighbors. After be informed about the positive impact of the program on their lives, she decided to join the same. However, her husband was skeptical about her attending these sessions. With the help of her daughters and other relatives, Samadaben finally convinced her husband to allow her to attend the awareness programs.

During the awareness sessions, Samadaben discovered various practices of milch animal rearing which she was previously unaware about. She also received information regarding the quantity and quality of fodder that should be given to ensure good health of the milch animal. Her eldest daughter also attended the meetings with her.

They came to know about the Artificial Insemination (AI) technology in awareness sessions. Although she is yet to adopt the technology, she is optimistic that there will be a positive impact on the productivity of milch animal.

Current Scenario

Today, Samadaben owns 4 buffaloes and sells 9 liters of milk every day. She now earns more than Rs 5,000 per month.

Prior to joining the cooperative society, Samadaben was worried about the marriage of her two daughters (17 and 16 years respectively) due to their financial constraints. However after receiving the pertinent knowledge and witnessing an increase in the monthly income, she is now confident that she will be able to save enough money for both the marriages.

Case Study- 6

Ranuben Gohil - Bambhaniya, Bhavnagar

EIA Name – Maahi

Enrolled under DCS – Bambhaniya

Background

Ranuben, aged 44, is a resident of Bambhaniya village in Bhavnagar District of Gujarat. She lives in a joint family. At present, the family owns 3 buffalos. The milk produced is sold at the village milk collection Centre.

Ranuben's family was not financially sound before dairy cooperative society was setup. They were engaged in agriculture and labor activity. Due to her engagement in many activities, Ranuben wasn't able to find time to carry out household chores properly.

Problem faced

Majority of the family members were involved in agricultural work. But their earning from agriculture was around Rs. 2500 per month, which was not sufficient to run the house properly. Thus, the family took up labor work too. But this didn't end their financial troubles.

The family then started engaging in dairying activities but owned only one buffalo. At this time they only earned around Rs. 1500-2000 from dairying. Ranuben wasn't much aware about dairy farming and nor did she interacted with other women about other possible activities. Ranuben, unfortunately is illiterate and so she can't easily understand about dairy activity.

Impact of Dairy Cooperative Society

With the Dairy Cooperative Society (DCS- Bambhaniya) being setup in the village under NDP-I; Ranuben first saw other villagers getting involved in activities at dairy cooperative society.

Learning about the experiences of other villagers; Ranuben felt encouraged to sell her milk at the dairy cooperative society.

Meetings were organized at the village dairy society, but Ranuben never used to attend these, as in her family women weren't permitted to interact with others in public. Hence Ranuben's husband was attending the meetings in village, but was unable to follow the instructions which were taught in the meetings. So in the initial phase, they couldn't reap much benefit from the scheme.

Gradually Ranuben and her family came to know that meetings, which were organized at dairy cooperative society, were very helpful. They started practicing the instructions and suggestions about animal health care, increasing milk productively and producing clean milk, which were discussed in these meetings. They also availed of the veterinary services provided by the dairy society. Under this service, the doctor visited their place and checked the milch animals for its health and provided more knowledge regarding animal health, its feeds and care. This helped them increase their milk productivity to 8-10 liters per day.

Ranuben and her daughter-in-law now interact with other women more often and get better informed on dairying practices. The learning and awareness sessions benefitted the family. They were able to buy another buffalo; also the quality of milk improved. As a result, their daily and hence monthly income from dairy activities rose.

Current Scenario

At present, Ranuben's family owns three buffalos, which give around 10 liters milk per day. Out of those 10 liters, they consume seven liters in house and sell three liters at dairy cooperative society. Their milch animals are healthy and the family is happy due to dairy services.

Case Study- 7

Maliben - Rojmal, Bhavnagar

EIA Name – Maahi

Enrolled under DCS – Rojmal

Background

Maliben, aged 55, is a resident of Rojmal village in Bhavnagar District of Gujarat. She lives in a nuclear family with her husband. Their children live separately outside the village. Currently, the family owns 1 cow and 2 buffalos, which yields milk for selling in the village milk collection centre.

They live in "Kuccha" house without any sanitation facility. Maliben's husband is engaged in agriculture activity and Maliben herself is involved in dairy related activities.

Problem faced

As already known above that Maliben and her husband were living in a kuccha house and they also don't have sanitation facility, their financial status was not very strong. They had one buffalo earlier but it was not giving sufficient milk. Additionally, the milk was also low in its fat content. Their family's primary occupation was agriculture, but it generated low income, which was insufficient for their needs. Their monthly income was around Rs.2000 – 2500 and by selling milk they were getting around Rs. 1000 to 1500 per month additionally. Maliben's major issues are with personal sanitation and health; and animal's health.

Impact of Dairy Cooperative Society

With the Dairy Cooperative Society (DCS- Rojmal) being setup in the village, she came to know about different services provided by the DCS. She started selling milk to the DCS, which helped her in making additional money.

Her neighbors and other women from her village persuaded her to accompany them for the farmers' meetings and awareness programs on balanced ration organized by the DCS. Eventually she agreed and started attending these sessions. Cultural issues deterred her from continuing her participation in these meetings. LRP also visited her house and provided important information about balanced ration. She learned many useful things from RBP and started implementing those on her buffaloes.

She now keeps a tab on the amount of intake taken by buffaloes and provides the required feed at the appropriate time. This has had a positive impact on her buffaloes and they started giving more milk. The buffalo milk has more fat content now compared to earlier. The family income has improved and so has the living conditions for the family.

Current Scenario

Now Maliben is able to earn around Rs. 4000 every month and saves a part of it. She intends to use the saved money for building a nice little house with proper sanitation facilities as that would be make their old age life comfortable. She is very thankful to NDP-I for providing this opportunity of learning things at free of cost. She strongly recommends the replication of this program to improve milch animals rearing in other villages too.

Case Study - 8

Aminaben - Tantaniya, Bhavnagar

EIA Name – Maahi

Enrolled under DCS – Tantainya

Background

Aminaben, aged 35, is a resident of Tantaniya village in Bhavnagar District of Gujarat. She lives with her family which includes four children. Currently, the family owns three buffalos, which yields milk for selling in the village milk collection center.

Aminaben lives with her family in a semi pukka house. They don't even have proper sanitation facilities. Previously they were engaged in farming activities. But that didn't provided them with steady income. Aminaben's husband is doing farming activities so almost all the dairy activities are done by Aminaben.

Problem faced

As can be seen, Aminaben and her family's primary source of income was agriculture, which ranged around Rs. 5000-6000 per month. But it didn't cover the family's monthly expenses. And they also had two buffalos at that time. She was not able to earn much as their buffaloes were not producing adequate amount of milk and the household itself consumed most of milk.

They were getting only Rs. 2000 to 3000 per month from dairy income. Because of lower income, her house didn't have proper sanitation facilities, which in turn affected their health as well.

Aminaben was unaware about improved dairying practices which deterred her from improving performance and earning better from dairying. She faced problems in taking care of the milch animal, providing proper feed etc. She sold around 8 liters of milk in a day which was also low in fat content.

Impact of Dairy Cooperative Society

With the Dairy Cooperative Society (DCS- Tantaniya) being setup in the village in 2014, she got the information about dairy cooperative society from her fellow villagers and came to know that they are have registered as members with the society and started pouring milk at the milk

collection center managed by the DCS. Her family also decided to get registered with the society. Aminaben also came to know about Ration Balancing Program after subscribing membership of the DCS. Aminaben started implementing the advice provided by LRP. She started getting positive results instantly. The milk given by the buffaloes increased significantly. She now sells around 18-20 liters of milk every day and earns more than Rs. 10000 every month.

Current Scenario

Aminaben and her husband are now able to fulfill their needs by engaging in dairy activities and they are very thankful to dairy society for the ration balancing program as it helped them to increase their earnings and now they are able to improve the facilities at their home.

Case Study- 9

Chanduben Bharvad – Dhakankunda, Gujarat

EIA Name – Maahi

Enrolled under DCS – Dhakankunda

Background

Chanduben Bharvad, aged 30, lives in a nuclear family with her husband, two sons and father-in-law. Chanduben is engaged in dairying activities while her husband works as an agricultural laborer.

Problems Faced

Previously, Chanduben's husband and father-in-law used to work as a daily wage laborer while she worked in dairying farming selling milk. However, the income generated was not sufficient

to meet the household requirements. They were unable to pay for their children's education as well.

For the past 2-3 years, Chanduben's father-in-law has not been keeping well. Her husband had to take a loan from his friend to pay for the medical treatment. However, the family has not been able to repay the loan due to very less earnings.

Chanduben learnt about the dairy cooperative society from other women in the village. Other women informed Chanduben about the benefits of associating with the dairy society. Chanduben wanted to become a member of the society, but her husband did not allow her to attend meetings organized by the dairy.

Impact of Dairy Cooperative Society

Initially, other women of the village attended meetings and awareness sessions organized by the dairy society and they passed on the information to Chanduben. After informing her husband about the benefits of attending the these sessions, Chanduben's husband agreed to let her attend them.

Over the months, she received information regarding Artificial Insemination (AI) and Ration Balancing Program (RBP). On learning about AI, Chanduben's husband decided that they should also adopt the technology for their milch animal. The family also followed ration balancing advice provided by LRP. As a result of which, they witnessed an improvement in the quality of the milk, and hence increase in milk income.

Current Scenario

Presently, Chanduben owns 5 buffaloes and is highly satisfied with her work. She spends most of her time in the day maintaining animals' shed and taking care of their feed. She goes to the dairy

once in a day to sell the milk. The milch animals give 20 liters of milk every day. Her husband also assists her in carrying out dairying activities.

Chanduben is now able to provide quality education to their children and have also paid off the loan they took to pay for the medical treatment of her father-in-law.

Chanduben truly believes that the improvement in her family's standard of living is majorly because of the benefits she has received from the dairy cooperative society.

Case Study -10

Gitaben – Khadsaliya, Bhavnagar, Gujarat

EIA Name – Maahi

Enrolled under DCS – Khadsaliya

Background

Gitaben, aged 28, lives with her husband in Khadsaliya village of Bhawnagar District in Gujarat. Her husband, Kamubhai, works as a laborer in farms and earns around Rs.8, 000 per month. The income is spent in paying off household expenditures. She is not able to make any savings.

Problems Faced

The income earned by Kamubhai was not sufficient to meet the all the household expenditures. Gitaben and her husband are also planning to have a child in the near future which will significantly increase their expenditure. They need to increase their savings so that they will have sufficient money to support the needs of three family members.

Kamubhai owns a buffalo but was unable to look after it and engage in dairy farming, as he was more occupied with agricultural work for most of the day. Thus, the additional income that could be earned from dairy farming was lost.

Impact of Dairy Cooperative Society

Gitaben decided to engage in dairy farming and take care of the buffalo to bring additional income to the family. Gitaben convinced her husband to allow her to attend the farmers' meetings on Rational balancing Program (RBP) organized by dairy cooperative society. Initially, her husband was little apprehensive but after witnessing other women attending the programs, he allowed her to become member of the dairy cooperative society.

After becoming member of the society, Gitaben participated in various programs and meetings where she came to know about valuable knowledge of dairy farming. The society staff gave information about the benefits of dairy farming and advantages of selling milk at the cooperative society rather than a private dairy.

With the knowledge received during meetings and awareness sessions, Gitaben now rears the buffalo and sells the produce at dairy cooperative society. Her husband also assists her as and when he gets time from work.

Current Scenario

Gitaben and her husband own 3 buffalos today and sell approximately 7-10 liters of milk every day to the dairy. From the milk sold, Gitaben earns around Rs.3, 000 – 4,000 per month. The additional income is mostly saved for the future child. Gitaben and her husband believe that the savings will be helpful in providing quality education to their child and build a bright future for the whole family.

Case Study- 11

Kantadevi Rawat - Dhapra, Bhilwara

EIA Name – Bhilawara

Enrolled under DCS – Dhapra

Background

Kantadevi, aged 42, is a resident of Dhapra village in Bhilwara District of Rajasthan. She lives in a nuclear family and has three children. Currently, the family owns only a cow, which yields milk that is sold at the village milk collection centre.

Problem faced

Her husband's income was insufficient to meet the household's daily expenses. Further, the money from her husband's wages didn't come on time when required. This used to lead to several difficulties to pay for basic expenses like food, education of children, health expenses, etc. Kantadevi was having trouble paying for her children's education, which she considered very important.

The family owned land but it was not being cultivated due to which Kantadevi felt that they were losing on the additional income they could have generated from agricultural activities.

Kantadevi's family faced many hardships due to their poor financial condition. Her husband even migrated and started working in different locations to help better the finances of the family. As

the family income was low and she didn't have proper education, she found it difficult to manage the household requirements.

Earlier the family did not have any milch animal and there was no dairy cooperative society in the village. Her neighbors were selling milk to a private dairy located outside the village. Due to lack of knowledge and awareness about dairying activities, her family was unaware about the benefits they could receive from owning milch animals and selling milk.

Impact of Dairy Cooperative Society

With the Dairy Cooperative Society (DCS- Dhapra) being setup in the village, Kantadevi saw women getting involved in dairying activities as well as in selling milk at the village center and making additional money. She interacted with these women about the activities involved and realized that they were getting paid well for the milk sold at the village collection center.

She got very encouraged and shared this information with her family. This encouraged her husband too to get involved with the dairy society. However, to join the Society they needed to get a milch animal first. The family had no financial capacity to buy a milch animal on their own, so her husband arranged a cow from his brother.

In return for the animal provided by her husband's brother, the family decided the following:

- Out of total milk produced from the cow, they will share half of the milk with her husband's brother.
- Kantadevi was given the responsibility of taking care of the cow including all the expenses such as fodder to be fed to the cow as well as the medical expenses of the cow.
- They had an arrangement internally where the first right of payment received from the dairy will be of Kantadevi's brother-in-law until the cost of cow was not recovered from it.

The cow produced approximately 2 liter of milk everyday which Kantadevi started selling at dairy cooperative society. Initially she was unable to provide higher quantity of milk and the earnings were low. However, gradually as she got involved into the dairying activities, the quantity increased and she started getting paid well for the milk produced.

She attended village meetings and awareness programs and took interest in participating whenever such programs were organized. As time went by, her involvement in the dairying activities and her participation in the meetings increased. She learnt about the fodder including the contents that should be fed to the cow for giving higher quality as well as increased quantity of milk. She also understood the various means by which to take care of the cow. This resulted in higher production of milk. More quantity and better quality of milk deposited at the dairy cooperative society resulted in higher earnings and she was able to recover the whole cost of the cow in a short span.

Current Scenario

After making the full payment to her brother-in-law, the ownership of the cow was transferred to Kantadevi's family, although she continued giving half of the milk produce to her brother-in-law out of gratitude and his timely help. Her gesture is appreciated by the entire village.

Today, Kantadevi spends 8-9 hours daily on dairying activities and the cow provides approximately 4-5 liters of milk every day. With this increased quantity of milk, Kantadevi earns around Rs 1,500 per month. The cow's health has also improved as the family now adopts better methods to take care of it and treats it as one of their own family member. She takes care of the cow on her own. The family is contemplating buying more milch animals from the money earned.

Despite sharing the milk produce, Kantadevi is able to manage the household expenses and children's education from the earnings received from half of the milk produce. The involvement in dairy farming proved fruitful for her family and she is very thankful to dairy society which has helped her in managing their financial situation and has given her and her family a new way of life and hope.

Case Study- 12

Kanchandevi Rawat - Dhapra, Bhilwara

EIA Name – Bhilawara

Enrolled under DCS – Dhapra

Background

Kanchandevi, aged 43, is a resident of Dhapra village in Bhilwara District of Rajasthan. She lives in a joint family and has three children- two boys and a girl. Financial condition of Kanchandevi's family was not good earlier. They had taken a loan of Rs.25,000 for children's education and her Father/Mother-in-law were facing health issues.

As they were primarily involved in agricultural labour; she did not have much time to do dairy activities.

At present, the family owns only a buffalo, which produces milk that is sold at the village milk collection center.

Problem faced

Kanchandevi and her husband, both were involved in agricultural labour. However, the income was insufficient to run the house properly or take care of the health related issues. Even with a primary education, both Kanchandevi and her husband had to take up the labor activities owing to their poor family conditions. On top of that, due to poor health conditions, sometimes only one of them could work. At such times, the income decreased even further and made things worse.

At the time, they did not own any milch animal and so were not engaged in any dairy activity or in animal husbandry. In the past, Kanchandevi and her family owned a buffalo, which died due to illness. Due to the past experience, her family was not in support of keeping any more animal. They also owned cultivated land but were not doing any farming activities on it leading to a loss of income.

To solve the financial problems, her family took a loan of Rs.25000. Using this amount, her family was able to provide for the medical expenses, children's fees and buy a buffalo to provide for household milk consumption. However, as the income was lower than the expenses, they were unable to pay off the loan installments on time.

Impact of Dairy Cooperative Society

With the Dairy Cooperative Society (DCS- Dhapra) being setup in the village, Kanchandevi observed women getting involved in dairying activities as well as in selling milk at the village center and making additional money. She too wanted to sell her buffalo's milk at the center to make additional money to take care of the household expenses. However, her mother-in-law was reluctant to the idea. So, Kanchandevi started secretly selling half the milk produce to the dairy. Her one month's earnings impressed her mother-in-law who then insisted on selling the entire milk produce to the dairy.

By selling their milk this way, the family was able to repay the loan gradually. Kanchandevi's husband procured the payment statements from the dairy and was surprised to learn that the earnings from the dairying activities not only helped in repaying their loan but also left his wife with some additional money for the household expenses.

Now, Kanchandevi is taking interest in a wider gamut of dairy activities and is attending most of the dairy related programs and awareness sessionss. She joined the RBP programme in the month of April in 2015.

Case Study- 13

Tipudevi Rawat - Dhapra, Bhilwara

EIA Name – Bhilawara

Enrolled under DCS – Dhapra

Background

Tipudevi, aged 42, is a resident of Dhapra village in Bhilwara District of Rajasthan. She lives in a nuclear family and has two children.

Currently, the family owns 2 cows and the milk produced is sold at the village milk collection centre.

Tipudevi is also engaged in agricultural labour. Her husband helps her to some extent but is not able to get completely involved as he has suffered a head injury.

Problem faced

Tipudevi’s family faced financial constraints along with one major health related issue. Tipudevi’s husband had a major injury on his head which was a big expense for her. As her income was very low, she faced many difficulties in running the house and paying for her children's education.

Tipudevi’s family took a loan to pay for the medical expenses. But they found it very hard to repay the loan. It was difficult for her to make ends meet.

At that time they had a cow, but they didn’t sell milk at the cooperative or private dairy assuming that they won't get a fair payment for their produce and that unfair practices might be used.

In addition, they did not even own any agricultural land and hence there was no scope of income from it either.

Impact of Dairy Cooperative Society

While the Dairy Cooperative Society (DCS- Dhapra) was setup in the village, Tipudevi and her family were not interested in selling the milk to the Dairy.

The Dairy secretary knew about the situation at her house and so he suggested Tipudevi's family to sell milk at the village dairy cooperative society and also gave assurance about fair measurement of fat and fair payments. He also informed them about the benefits of the same from which they will be able to make additional money.

Keeping faith in the dairy secretary, Tipudevi started selling milk at dairy cooperative society. As their milch animal produced low quantity of milk, initially she only sold milk once a day at the Dairy Center. As they learned about the Dairy activities and animal husbandry from the Dairy Cooperative Society and implemented the learning, the milk produced by the cows increased. She started selling milk twice a day at dairy center. This gave them an income of Rs.

3000-4000 for 15 days. This amount helped them in repaying the loan and in getting the medical facilities for her husband.

Current Scenario

Tipudevi is selling around 5 to 6 liters of milk a day at dairy cooperative society. The health of the cows has improved too. Healthier cows now produce higher quality and more quantity of milk. Even if on some days there is less milk for personal consumption, they try to sell at least one liter of milk at the society. The family has immensely benefitted from the dairy center at the village.

Case Study- 14

Nanydevi Rawat - Dhapra, Bhilwara

EIA Name –Bhilawara

Enrolled under DCS – Dhapra

Background

Nanydevi, aged 50, is a resident of Dhapra village in Bhilwara District of Rajasthan. She lives in a joint family. The family owns only a cow, whose milk is sold at the village milk collection center. Nanydevi's family faced major problem related to health. Her husband suffered from mental imbalance; the treatment for which was expensive.

Problem faced

Nanydevi's husband suffered from mental imbalance. In order to pay for the high medical expenses, Nanydevi's family took a loan. Her husband recovered with time. However, Nanydevi was unable to pay back the loan and was also unable to meet the daily household expenses. The family, which was already financially poor, was now even more economically vulnerable than before.

Impact of Dairy Cooperative Society

After the setup of the Dairy Cooperative Society in the village, Nanydevi's family decided to buy a cow and started selling milk to the dairy. Initially they sold around two liters a day. The milk produce of the milch animal at the time was low as Nanydevi was not aware about animal husbandry. But slowly she began to attend meetings at the dairy cooperative society and became aware about how to take better care of her milch animal. She implemented her learning and the milk production increased. She started selling milk twice a day.

As a result of increased income, the family was able to repay the loan they had taken for the treatment of Nanydevi's husband. Nanydevi was also able to provide for quality education to her children.

Current Scenario

Currently, Nayandevi and her husband have sent their son to Bangalore so that he has access to better employment opportunities. They have also been able to contribute Rs. 20,000 towards their son's marriage. This has given Nanydevi a sense of economic and emotional accomplishment.

Case Study- 15

Miradevi Rawat - Dhapra, Bhilwara

EIA Name – Bhilawara

Enrolled under DCS – Dhapra

Background

Miradevi, aged 46, is a resident of Dhapra village in Bhilwara District of Rajasthan. She lives in a nuclear family and has three children. Currently, the family owns only a buffalo, which yields milk that is sold at the village milk collection center. The family faced many financial problems due to lack of awareness and education after the death of Miradevi's husband and her elder daughter.

Problem faced

Miradevi lost her husband and later her elder daughter to unfortunate incidents. After the deaths; she had no source of income. She was left alone to look after the family of three. She was unable to manage the economic conditions and make financial decisions.

Her husband had left the family with a buffalo. They did not have any other assets like agricultural land. So Miradevi had no additional income and was involved in agricultural labour .

Impact of Dairy Cooperative Society

With the Dairy Cooperative Society (DCS- Dhapra) being setup in the village, Miradevi noticed her village women getting involved in dairy activities as well as in selling milk at the village center from which they used to make additional money. So she too joined the village dairy society.

Miradevi milks the buffalo and sells it to the dairy in the village. The family is now able to sell milk twice a day and earn around 2000-3000 every 15 days. They are completely dependent on the dairy for their daily needs and for providing for the education of the children.

Current Scenario

Miradevi, today, does agriculture labour activities and has an additional income from dairy. Doing this she is able to run the house properly and also fulfill her responsibilities towards her family. She is very thankful for help provided by the dairy society which has helped her manage her financial situation and given her and her family a new lease on life and hope.

Case Study- 16

Urmiladevi Tiwadiwala, Jaipur

EIA Name – Paayas

Enrolled under DCS – Tiwadiwala

Background

Urmiladevi, aged 35 years, of Tiwadiwala village, Jaipur lives in a nuclear family of four members and is involved in dairy farming. She is the sole earning member in the family.

The family owns 3 buffaloes out of which only one buffalo is lactating. The whole burden of household work as well as dairying activities falls on Urmiladevi.

Problems Faced

Urmiladevi faced the issue of water shortage and storage of fodder for the animals. Previously, she did not have a storage room to store the fodder. She bought fodder in bulk quantity that made it difficult to store it in a single place.

Additionally, the fodder had to be brought from outside villages which increased transportation cost thereby resulting in decreased savings.

Impact of Dairy Cooperative Society

After learning about the dairy cooperative society, Urmiladevi started attending the awareness sessions. The Ration Balancing Program (RBP) provided information and knowledge to the villagers on matters relating to the nutritional requirement of buffaloes, type, quantity & quality of food that should be given and other such dairy related awareness sessions. LRP also helped Urmiladevi to understand the food requirements of her animals. She no longer stored additional fodder and hence, the issue of storage of food was resolved. The dairy also provided mineral mixtures for the milch animals as a result of which Urmiladevi had to no longer travel long distances and expend money to buy cattle feed for her milch animals.

Current Scenario

With the awareness sessions and help received from the dairy, Urmiladevi has witnessed an improvement in the quality of milk as well as an improvement in the health of the milch animal. Over the course of time, the milk production of her milch animal has increased leading to higher earning and profits and thus higher savings. This has helped the family to plan their future and dairy related activities.

Today, Urmiladevi single-handedly supports the needs of her family. She encourages other women in the village to attend awareness sessions and farmers' meetings that may help improve their standard of living as well.

Case Study- 17

Sarojini Devi – Chandrapur Jatan,Jaipur

EIA Name – Paayas

Enrolled under DCS – Chandrapur Jatan

Background

Sarojini Devi lives in a joint family in Chandrapur Jatan village in Jaipur. She lives with her husband, three children and her brother-in-law. The family owns a semi-pucca house but does not have a private toilet in the house. Her husband and brother-in-law are involved in agricultural activities while she works in dairy farming.

Problems Faced

Earlier, Sarojini Devi used to sell the milk at a private dairy. The dairy did not give fair payment for the fat content present in the milk. The dairy owner used unfair practices in measuring the fat content. Moreover, there was a delay in payment for the milk produce. Due to lower earnings, Sarojini and her husband were unable to pay for their children's education.

Another problem faced by Sarojini Devi was that she did not have adequate information on health of the milch animals, their nutrition requirements and remedies for their medical treatment.

Impact of Dairy Cooperative Society

Sarojini Devi's neighbors and other women in the village informed her about Paayas dairy. They shared their experiences about the awareness sessions they had received and the benefits they enjoyed. On hearing about the positive impacts of awareness sessions, Sarojini Devi too decided to become a member of the dairy.

After joining Paayas dairy, Sarojini attended various awareness sessions. She learnt about efficient methods of feeding milch animal and providing nutritious food to them.

The dairy also had a doctor to treat the milch animals and provided advice to villagers on keeping their animals healthy. Sarojini Devi learnt about Artifical Insemination (AI) and has decided to adopt the technology in future.

Current Scenario

Sarojini Devi and her family witnessed an improvement in their standard of living over the past few years. Today, they own 2 cows and 1 buffalo. She sells around 20 litres of milk every day to the cooperative society.

Sarojini and her husband are now able to provide quality education to their children. They plan on building a bathroom and a toilet in their home in the future.

Case Study- 18

Seema Yadav– Chandrapur Jatan, Jaipur

EIA Name – Paayas

Enrolled under DCS – Chandrapur Jatan

Background

Seema Yadav, aged 25, lives with her husband, two children and her father-in-law in Chandrapur Jatan village of Jaipur district.

She is engaged in dairy farming while her husband works as an agricultural labor.

Problems Faced

Previously, Seema's husband and father-in-law used to work as daily wage laborers while she worked in dairying farming selling milk. However, the income generated from both the activities

together was not sufficient to meet the household requirements. Seema and her husband were unable to pay for their children's education.

Over the years, Seema's father-in-law's health had started deteriorating. The family had to take a loan from the bank to pay for his treatment. The family was unable to repay the debt due to limited earnings.

Impact of Dairy Cooperative Society

Seema heard about the dairy cooperative society from other women in the village. They informed her about the benefits they have received and improvements they observed in their standard of living.

Seema enrolled herself in the dairy cooperative society and started attending the awareness sessions. She received information on matters like methods to feed, milch animal rearing, how to maintain healthy cowshed environment and about the vaccinations required by the milch animal.

As an effect of the knowledge received, Seema witnessed an increase in the quality and quantity of milk produced by her milch animal. The dairy also made timely and fair payments to the villagers for their produce.

Seema availed the veterinary facility from the dairy cooperative for her milch animal for their medical treatment. She also undertook the awareness sessions on Artificial Insemination (AI).

Current Scenario

Today, Seema and her husband own 2 cows and a buffalo, which together give 40 litres of milk that is sold at the dairy cooperative. They earn around Rs.6000 from dairy farming and Rs.14, 000 from agricultural activities. The family is now financially stable and has paid off the debt they had taken to pay for the medical treatment.

Her family lives in a pucca house and is now economically stable. Seema is thankful to the dairy staff for their assistance and for encouraging her to continue the work. She feels motivated to provide an even better lifestyle to her family. She encourages other women of her village to enroll in the dairy too and incur the benefits like she did.

Case Study- 19

Manni Meena – Kanwarpura, Jaipur

EIA Name – Paayas

Enrolled under DCS – Kanwarpura

Background

Manni Meena, aged 40, lives in a joint family of 7 members in Kanwarpura, Jaipur. Out of seven, three female members of the family are engaged in dairy farming. Most of their time is spent in grazing, feeding and cleaning the milch animal. The male members of the family are involved in agricultural activities.

Problems Faced

Previously, the male members of the family did not allow the women to engage in any work. They were asked to stay at home and finish the household chores while the men went for agricultural farming. However, the income earned by men was not sufficient to meet the household requirements.

Manni's neighbors and friends in the village informed her about dairy farming and the benefits they had received. They also told her about the dairy cooperative society and the awareness provided by it. This motivated Manni and other female members of the family to engage in dairy farming.

Manni discussed about the same with her husband who at first refused to send her for work. However, on hearing about the benefits of dairy farming, he and the other male members of the family allowed the women to enroll in the dairy cooperative society.

Impact of Dairy Cooperative Society

After enrolling in cooperative society, Manni received awareness sessions on the basics of dairy farming. The staff gave her information about the benefits of dairy farming and advantages of selling milk at the cooperative society rather than at a private dairy.

The staff at dairy cooperative also helped the family in procuring milch animal from the market. They taught about the methods and techniques of rearing milch animal, feeding them, maintaining the cowshed and other dairy related activities.

Current Scenario

Manni's family has observed a raise in their standard of living post engaging in dairy farming. There has been an increase in the household income as all the family members are now engaged in either agriculture or dairy work.

The family now owns 2 cows and a buffalo and sells around 10-15 liters of milk to the dairy cooperative every day.

Manni's husband agrees that even though at first he was apprehensive about women engaging in any work, dairy farming has really helped the family to make the ends meet. Manni strongly believes that engaging in this work has motivated her and generated more confidence in her. She is grateful to the dairy cooperative society for educating her about dairy farming and providing payments on time for the produce.

She highly recommends other women of her village to enroll in the dairy and reap the benefits.

Case Study- 20

Anita Yogi – Baori Gopinath, Jaipur

EIA Name – Paayas

Enrolled under DCS – Baori Gopinath

Background

Anita Yogi, aged 30, lives in a nuclear family in Baori Gopinath, Jaipur. Her husband is involved in agricultural work while she works in dairy farming.

The family lives in a kuccha house and does not have proper sanitation facility.

Problems Faced

The income earned together from the agricultural and the dairy activities was insufficient to meet the requirements of the household.

They did not have a proper shed to keep the milch animal because of which they were unable to take proper care of them. During rainy seasons, it became difficult to protect the milch animal. The milch animal suffered from infections and produced low quantity of milk along with very low quality.

This hampered the income potential of family resulting in them taking loans to meet their everyday expenditures. The low earnings did not allow them to have any savings which could be used during contingencies.

Impact of Dairy Cooperative Society

Anita's husband is a member of village Panchayat. He witnessed the positive impact of the awareness sessions provided by the dairy staff to the villagers. On consultation with dairy staff, he decided to join the dairy along with his wife.

After enrolling, Anita participated in farmers' meetings and awareness sessions on Ration Balancing Program (RBP) on various dairy related activities. She learnt about the methods of optimizing the produce, maintaining the health of the milch animals and about the nutritious food that should be given to them.

Anita also started selling her produce at the dairy. The dairy made fair payments according to the quality of milk and fat content present in it. This resulted in an increase in income of the family with the help of which she was able to build a shed for the milch animals.

Anita also received medical treatment for her milch animals and information regarding the ways to ensure high productivity.

Current Scenario

Today, Anita and her husband own 4 animals and sell around 25 liters of milk every day. Their total income from the agricultural and dairy activities is now around Rs. 20,000 per month. They have been able to build a cowshed for the milch animal and also a bathroom outside their home. Anita believes that without the help of the dairy she would not have been able to ensure the good health of her milch animal and their higher earnings.

Case Study- 21

Jyoti Nayak – Dandamir, Cuttack

EIA Name – Cuttack

Enrolled under DCS – Dandamir

Background

Jyoti Nayak, aged 28, is from Dandamir village, Jagatsinhpur district of Odisha. She lives in a joint

family of six members. Jyoti as well as her husband are involved in dairying activities for the past 10-12 years.

Her family owned one cow, which yielded milk that was sold at the milk procurement centers. This was the only source of income for the family and thus Jyoti was unable to meet the households expenses from this income.

Problems Faced

Jyoti and her family did not have adequate knowledge about the new techniques that could improve the milk productivity of their cow.

Other women from the village informed Jyoti about the knowledge provided by the dairy. They told her about the benefits they had received from applying the techniques they learnt during awareness sessions. After discussing with her husband, Jyoti joined the dairy in 2014.

Impact of Dairy Cooperative Society

Jyoti started participating in Ration Balancing Programme (RBP) in April, 2014 where trained LRP provided advisory services such as feeding balanced ration to their animals to the dairy farmers.

After implementing the knowledge she learnt from the awareness sessions, her cow's milk production capacity increased by 1 litre (i.e. 8 to 9) and milk's fat content also improved (i.e. 4.2 to 4.5). RBP, thus, contributed to improving the quantity and quality of milk which led to an increase in the family's income by Rs. 1000-1200 per month and hence improving the standard of living of the family.

Current Scenario

Before their introduction to RBP, Jyoti did not attend any kind of meetings or discussions. But now she attends all dairy and RBP related meetings. She spends most of her time in dairy

farming activities. Today, Jyoti understands the importance of the ration balancing program she received and encourages others in her village to join the dairy too.

Case Study- 22

Mamta Nayak – Ishwarpur, Cuttack

EIA Name – Cuttack

Enrolled under DCS – Ishwarpur

Background

Mamta Nayak, aged 37, is a resident of Ishwarpur village in Jagatsinhpur district of Odisha. She lives in a joint family of six members with only two working members, which includes herself and her husband. Mamta and her husband are involved in dairy farming activities for the past 15 years. The family owns 2 cows.

Problems Faced

Mamta and her family used to sell the milk produced by the cows to a private dairy. However, the owner of the dairy used unfair practices while measuring the fat content of the milk and did not compensate them fairly. The unfair payment led to a decrease in the monthly income of the household.

Moreover, the owner did not make the payment for the produce on time. The delay in receiving the payment made it difficult for her family to pay for their daily expenses as well as for the expenses related to the maintenance of milch animals.

Impact of Dairy Cooperative Society

With the establishment of Dairy Cooperative Society in the village, the villagers no longer depended on the private dairy for selling their milk produce. DCS made fair payments based on the fat content present in milk. The fat content of the milk is measured through a standard device. Each animal covered under RBP was uniquely ear tagged so as to enable the monitoring of its productivity and efficiency through data fed into a performance recording system. Trained Local Resource Person (LRP) provided advisory services to the dairy farmers on feeding balanced ration to their animals.

Mamta too started receiving awareness sessions under RBP from the month of April, 2014.

Current Scenario

Earlier, the cows owned by the family produced around 10 liters of milk every day. After implementing the learnings from the awareness sessions and with the help of the milch animal health care, the milk productivity of the cows has increased to approximately 12 liters per day. There was an improvement in the fat content of the milk as well (from 3.5 to 4.1). RBP programme has improved milch animals' milk quality as well as the quantity. This has led to an increase in family income.

The family is completely dependent on the dairy income to run their household as well as to meet their milch animals' feeding expenses. With the increased income, Mamta is able to feed better quality fodder to her milch animal and to pay for their medical treatment. This has resulted in an improved health of the milch animal ensuring better produce.

Mamta now shares her knowledge with other people and spends majority of her time in dairying activities. She is happy and much more confident about her work after receiving the RBP awareness sessions. Mamta feels that each and every villager should avail ration balancing services so that they can also reap the benefits from the scheme similar to her family.

Case Study-23

Ransakta Jena – Mondokeswar, Cuttack

EIA Name – Cuttack

Enrolled under DCS – Mondokeswar

Background

Ransakta Jena, aged 45 years, resides in Mondokeswarvillage, Jagatsinhpur district of Odisha.

The family owns only a cow. The milk produced from the cow was not sufficient to meet the requirements of the household.

Problems Faced

Before the establishment of dairy cooperative society in the village, Ransakta and her husband were employed as agricultural labors. However, the income generated from these activities was very low and did not meet household requirements.

Impact of Dairy Cooperative Society

After the establishment of the Dairy Cooperative Society in the village, the dairy secretary informed Ransakta about the benefits of selling milk at the cooperative. Jointly, Ransakta and her

husband decided to buy a cow with the limited savings that they had. She started receiving RBP services, from the month of April, 2014, where trained LRP provided advisory services to the dairy farmers on feeding balanced ration to their animals.

Implementing this knowledge increased the quantity of milk produced and also improved the quality of milk. This led to increased earnings for Ransakta from selling milk and helped her overcome the problems she was facing in daily dairying activities.

Current Scenario

Today Ransakta's cow produces 7 liters of milk per day, an increase of one liter from the past. Fat content of the milk has also improved from 5 to 5.5.This has ultimately resulted in a rise in the family's income by Rs. 1,500.

Ransakta participates in decision making related to the selling of milk, cultivation of animal feed, buying animal feed and other related activities. She also attends the dairy and RBP related meetings and awareness sessions. She is content and happy with her work.

Case Study- 24

Kadambini – Osakana, Cuttack

EIA Name – Cuttack

Enrolled under DCS – Osakana

Background

Kadambini, aged 52, is from Osakana village, Jagatsinhpur District, Odisha. She lives in a joint family of six members with three members working in agriculture and dairying activities. The family has been

engaged in dairy farm activity for the last 30 years. The family owns 5 cows out of which 3 are lactating. The family also has 3 bigha of cultivable land.

Problems Faced

Even with three lactating cows in the family, the quantity of milk produced was very low. This was mainly because of poor health of the cows. The family was unaware about the best practices that should be adopted to keep the milch animal healthy. This resulted in poor health thereby leading to low quality and quantity of milk.

The income from agricultural activities was also low. Thus, the household income available was not sufficient to meet the requirements of the family.

Impact of Dairy Cooperative Society

Kadambini has been taking benefits of Ration Balancing Program (RBP) since April 2014. She registered her cows under the program and learnt about healthier feeding practices through awareness sessions by Local Resource Person (LRP).

With the establishment of the dairy cooperative society, women of the village started interacting more with each other and exchanged information about the practices followed by them to keep their milch animal healthy. This helped Kadambini to learn about new methods and techniques of production.

Current Scenario

With the implementation of the knowledge gained from the awareness sessions received under RBP, the milk productivity of the cows has increased up to approximately 40 liters of milk every day. Previously, the cows gave around 20 liter of milk every day. There is also an increase in the fat content present in the milk from 4.4 to 4.6.

The increased output has resulted in an increase in the household income. The family is now able to meet the household expenses and able to take proper care of the milch animals. Kadambini recommends others to receive ration balancing advice. Previously, she had never attended meetings before, but now she attends most of the meetings related to RBP and Dairy.

Case Study- 25

Barsine Das – Panitira, Cuttack

EIA Name – Cuttack

Enrolled under DCS – Panitira

Background

Barsine Das, aged 40, is from Panitira village, Jagatsinhpur district, Odisha. She lives in a nuclear family with her husband and two children. She has been working in dairy farming from the past 27 years. She and her husband work in the same field. The family used to own a cow.

Problems Faced

Previously, the family carried out dairy farming with only one cow. The income generated from dairying activities was low due to which Barsine and her husband were unable to meet their daily expenses, especially their children's education.

The family decided to take a loan of Rs. 20,000 to buy an additional cow and pay for their children's education. However, due to lack of awareness about the modern methods and

techniques of production, the milk production from the two cows was still low. The environment around the animal shed was not clean as there was no knowledge regarding the same.

Even with the 2 cows, there was no significant increase in the family's income which made it difficult for the family to repay the loan.

Impact of Dairy Cooperative Society

The Dairy Secretary and other women of the village informed Barsine about the Ration Balancing Program (RBP) being implemented in the village. The other women of the village spoke about the benefits they had received from the awareness sessions provided under this program. Barsine informed her husband about the benefits and he readily agreed to enroll on the program.

After enrolling with the Ration Balancing Program (RBP), Barsine received the awareness regarding feeding practices, cleaning of the shed and maintaining healthy environment for the milch animals. Upon implementation of the methods learnt from LRP, Barsine witnessed an increased in the milk productivity of her cows.

Current Scenario

After the implementation of the lessons learnt in the awareness sessions, the productivity of the cows has increased. While in the past they used to give approximately 12 liters of milk every day, today they give almost 20 litres of milk. It is not just the quantity of milk that has increased but the quality of milk has improved too. The fat content in the milk has increased from 5 to 5.5.

The positive impact of RBP is that it has led to a rise in the family's income, which is reflected in their improved standard of living. The rise in income has also helped the family repay their agricultural loan. Barsine and her husband are able to provide for a good quality of education to their children. Barsine and her family attribute their improved standard of living to the awareness

sessions provided by the cooperative dairy. The benefits accrued to her family keep Barsine motivated to work harder and create a brighter future.

Case Study- 26

Kamkshi– Tharamanakatte, Mandya, Bangalore

EIA Name – Mandya

Enrolled under DCS – Kaggalipura

Background

Kamakshi, aged 38, lives with her husband and her son in Tharamanakatte village of Mandya district in Karnataka. Her husband is involved in agricultural work while she works in dairy farming. Kamakshi has received primary schooling and hence, is little aware about the functioning of dairy farming.

Problems Faced

Since Kamakshi has only attended primary school, she found it difficult for her to adapt to new technologies and methods that are used in dairy farming. These new methods help in increasing the productivity of milch animal thereby increasing the quantity and improving the quality of milk produced. She was unable to optimize the production of milch animal leading to lesser income generation.

Kamakshi learnt about benefits offered by dairy cooperative society from other women of the village who informed her about the benefits they received from attending awareness sessions and meetings. She decided to enroll herself in dairy and attend the meetings and sessions.

However, Kamakshi's husband did not allow her to enroll in the dairy cooperative. He did not want his wife to go out and engage with other villagers. Kamakshi informed her husband about the benefits and convinced him to allow her to enroll with the society.

Impact of Dairy Cooperative Society

Upon enrolling with the dairy cooperative, Kamakshi received knowledge regarding the basic functioning of dairy farming and the new methods and techniques available. She learnt about the methods of feeding, rearing and cleaning the milch animal, maintaining healthy environment for them and also about Artificial Insemination (AI).

Kamakshi also availed the veterinary services available at the dairy cooperative. This helped her maintain good health of her cow.

Current Scenario

Today, Kamakshi sells around 20 litres of milk every day and earns approximately Rs.8,000 every month. She has carried out the process of Artificial Insemination after learning about it from the awareness sessions.

Kamakshi and her husband are now able to pay for their household expenses and provide quality education to their son. They've also bought additional agricultural land and now own around 19.5 bighas of cultivable land.

Case Study-27

Dalamma –Chennapillekoppalu, Mandya, Bangalore

EIA Name – Mandya

Enrolled under DCS – Chennapillekoppalu

Background

Dalamma, aged 50, lives with her husband and son in Chennapillekoppalu village of Mandya district. Her husband is engaged in agricultural work while she works in dairy farming. The family owns a cow.

Problems Faced

Previously, Dalamma's family lived in a kutcha house, which did not have proper amenities of sanitation or even a bathroom. They also did not have a shed for their cow.

The income from agriculture was not sufficient to meet the needs of the household. Dalamma and her husband found it difficult to pay for their son's education.

Dalamma worked in dairy farming but was unaware about efficient methods to rear and feed her animals. This resulted in low income generation from selling milk.

The family owned agricultural land but were unable to optimize the production on it due to lack of proper machinery and inputs such as fertilizers and pesticides as they had no savings to buy the inputs.

Impact of Dairy Cooperative Society

After learning about the dairy cooperative society, Dalamma started attending the society meetings and awareness sessions. The dairy society organized awareness sessions to the villagers related to the nutrition requirement of milch animal, type, quantity & quality of food that should be given and other such dairy related awareness sessions. This helped her understand the food requirements of her milch animal. She also learnt about Artificial Insemination (AI) technology at the society meetings.

Women of the village started exchanging information about the practices followed by them to keep their milch animals healthy. This helped Dalamma to learn about new methods and techniques of production.

Current Scenario

Dalamma owns a cow. The awareness sessions have helped in increasing the quality and quantity of milk produced by the cow. It now produces enough milk for them to be able to sell 9 liters of milk every day at the dairy.

Dalamma earns around Rs.10000 from dairy farming. With the increased income, Dalamma's family is able to meet the daily household expenditures and have built a shed for their cow. The increased income has also enabled them to buy inputs for agricultural activities thereby resulting in an increase in the agricultural produce as well.

Case Study-28

Pottamma– Hunasikote, Kolar, Bangalore

EIA Name – Kolar

Enrolled under DCS – Hunasikote

Background

Pottamma, aged 45, lives with her husband and two children in Hunasikote village of Kolar district. The family owns a pucca house with proper sanitation facility.

Pottamma's husband works as a laborer in agriculture while she is engaged in dairy farming. Pottamma has never attended school and thus finds it difficult to understand about the new methods and techniques of dairy farming.

Problems Faced

Pottamma spent most of her time doing dairy farming activities– milch animal rearing, feeding, cleaning and maintaining the cowshed. However, even after investing most of her time in these activities, the milk produce was low due to the ill health of the animals. She was unaware about

the proper measures of taking care of the milch animals and this ultimately led to a decline in the total milk produce.

Due to lack of time, Pottamma was unable to pay attention to household chores and to her children's education. Her husband too worked all day to on field to earn money to meet the household expenditures and pay for their children's education. Thus, all the responsibilities and duties of house were Pottamma's responsibility.

Impact of Dairy Cooperative Society

Pottamma learnt about the awareness sessions provided by the Dairy Cooperative from her neighbors in the village. In an attempt to increase the productivity of her milch animal, she decided to enroll herself in the dairy and attend the meetings and awareness sessions.

After enrolling and attending the meetings, Pottamma learnt about efficient methods to feed the milch animal and about the nutritious food that should be served to them in order to ensure their good health. LRP helped her in providing balanced feed to her animals. She also received information about Artificial Insemination (AI) which proved to be very helpful.

Through discussions with other women in her village who sell their produce at the dairy cooperative society, Pottamma became aware about the various methods adopted by them to ensure higher quality and quantity of milk.

Pottamma also accessed the veterinary facility available at the dairy to ensure good health of her milch animal. Her milch animal received the necessary vaccinations and medical treatment timely.

The dairy cooperative also makes timely and fair payment for the produce based on the fat content present in the milk. This ensures a steady income for the family that helps the family meet their everyday needs.

Current Scenario

At present, Pottamma owns 2 cows and sells approximately 20 liters of milk every day at the dairy cooperative. She earns around Rs.15, 000 per month from selling this milk and this money is used to pay for the household expenses and also for her children's education.

There has been a positive impact of the dairy cooperative society and the awareness sessions in Pottamma's life. She now supports her husband in agricultural work and has almost 5 bighas of cultivable land.

Pottamma is thankful to the dairy cooperative that helped her increase her family's standard of living and provided a steady source of income.

Case Study-29

Mari Tayamma–Kaggalipura, Mandya, Bangalore

EIA Name – Mandya

Enrolled under DCS – Kaggalipura

Background

Mari Tayamma, aged 70, lives with her husband, son and daughter-in-law in Kaggalipura village of Mandya district in Bangalore. Her son and husband are involved as labor in agriculture field while she works in dairy farming.

Problems Faced

Mari Tayamma was unable to look after all the dairy related work because of her old age. She faces several health problems due to which she was unable to attend to dairy activities along with the household chores.

Mari's family had to bear a lot of expenses during their son's marriage. They borrowed money from their relatives for the same. With a new member in the family, they also had to buy new appliances and furniture.

However, the income generated from agriculture and dairy farming was not sufficient to meet the expenditures.

Impact of Dairy Cooperative Society

After learning about Ration Balancing Program (RBP) from her neighbors, Mari decided to join the dairy cooperative. After enrolling in the dairy cooperative society, Mari Tayamma participated in farmers' meetings and awareness sessions to better understand the do's and don'ts of dairy farming. She learnt about new methods and techniques to increase the productivity of her milch animals. Mari Tayamma also received vaccination and accessed the veterinary services for her milch animals.

Current Scenario

With the assistance provided by the dairy cooperative society, Mari Tayamma has observed a positive impact in her family. Her daughter-in-law now assists her in carrying out the dairy related work.

Her family now owns 2 cows and sells approximately 20-25 liters of milk every day at the dairy. The family earns around Rs.10, 000 from dairy farming and Rs. 1000 from agriculture work. They have been able to buy more agricultural land and now they own 2.5 bighas of cultivable land. They have also repaid the loan they took from their relatives during their son's marriage.

Even though Mari Tayamma is getting old, she enjoys her work and is motivated to do it. With the new information she has received from dairy, she is all the more enthusiastic to rear her milch animals and sell the produce.

Case Study-30

Pathnamma– Madikeri, Kolar, Bangalore

EIA Name – Kolar

Enrolled under DCS – Madikeri

Background

Pathnamma, aged 63, lives in a joint family of 8 members in Madikeri village of Kolar district in Bangalore. There are only 3 working members in the family who are engaged in dairy farming and agriculture work.

Problems Faced

Since there were only three working members in the family, it became difficult to meet the expenditures of all members of the family on a single source of income. Other members had temporary jobs and hence, there was no fixed source of income from their end. This resulted in fluctuating income for the family and thereby lesser savings.

The family owned a single cow, which produced milk to be sold at the dairy cooperative. However, those engaged in dairy farming had little knowledge about the measures to be adopted in order to keep the cow healthy and fit. This resulted in a lower quality of milk.

Impact of Dairy Cooperative Society

Patnamma heard about the Ration Balancing Program and the knowledge provided through this program from her neighbors. She observed the positive impact the awareness sessions had on the lives of other villagers. She too decided to enroll herself at the dairy and attend the awareness sessions on RBP.

On attending meetings and awareness sessions, Patnamma received information about carrying out dairy related activities efficiently. She became aware about the nutrition requirement of milch animals and methods to maintain milch animal's good health from LRP. Patnamma also received vaccination and veterinary facilities for her cow.

Apart from the awareness sessions, the dairy cooperative also made timely payments for the produce. The payments were fair and calculated based on the fat content present in milk. This ensured a steady flow of income for the family.

Current Scenario

At present, the total monthly income of the family is approximately Rs.15000 together from the dairy farming as well as the agriculture activities. The cow produces 10 liters of milk daily which is sold at the dairy cooperative.

The increase in the family income led to higher savings. These savings were used to buy inputs for agricultural activities.

After enrolling in the dairy cooperative, Patnamma feels motivated to work harder and earn for her family. She is grateful to the dairy cooperative for educating her and ensuring a steady flow of income for her family.

Case Study-31

Ratnamma – Meadderi, Kolar, Bangalore

EIA Name- Kolar

Enrolled under DCS – Meadderi

Background

Ratnamma, aged 65, lives in a joint family of 8 members in Meadderi village of Kolar district. There are three working members in the family who are engaged in both the agriculture activities as well as in the dairy farming.

The family owns a pucca house with proper sanitation facility.

Problems Faced

With only three working members in the family, the income earned was insufficient to meet all the requirements of the household. The family found it difficult to pay fees for their children's education.

Ratnamma worked in dairy farming but was unaware about the efficient methods to rear and feed the milch animal. This resulted in a low income generation from selling milk.

The family owned the agricultural land but was unable to optimize the production on it due to lack of proper machinery and inputs such as fertilizers and pesticides. Due to low earnings, there were no savings to buy the inputs.

Impact of Dairy Cooperative Society

After learning about the dairy cooperative society, Ratnamma too started attending the society meetings. The society provided awareness on RBP to the villagers and organized a awareness program on the matters of nutrition requirement of milch animal, type, quantity & quality of food that should be given and other such dairy related awareness sessions. The awareness sessions helped her understand the food requirements of her milch animals. She took help from LRP to understand the correct ways feeding her animals.

Current Scenario

Ratnamma has been selling milk at the dairy cooperative society for the past ten years. Today, she sells approximately 10-13 liters of milk everyday earning around Rs. 8000 every month. The

awareness sessions received at the dairy cooperative has helped her increase the quantity as well as improve the quality of the milk. There has also been an increase in the fat content of the milk. Ratnamma and her family are now able to fulfill all the requirements of the household and pay for their children's education. They are earning a little in addition that goes to the savings and can be used during contingencies.

There has been an overall improvement in the standard of living of Ratnamma's family due to knowledge provided and the payments received from the dairy cooperative society. She strongly encourages other women of the village to attend these awareness sessions to ensure benefits for them.

Case Study-32

Laxmi –T.Ballekere, Bangalore

EIA Name- Mandya

Enrolled under DCS- T. Ballekere

Background

Laxmi, aged 47, is a resident of T. Ballekere village of Banaglore. She lives in a family of 6 members with her two sons, in-laws and her husband. The primary occupation for the family's sustenance has been agricultural cultivation. The male members of the family are involved in agricultural activities while the ladies spend most of their time doing household activities.

Problems faced

Farming as the sole source of income was not generating sufficient income for the family. Laxmi wanted her children to complete their education and have good lives in their future. This dream of hers was being hampered by their financial crisis and their inability to make ends meet.

Impact of Dairy Cooperative Society

She saw her neighbors and friends earning well from the Dairy Cooperative Society and an increasing numbers of villagers started getting involved in dairying activities. Laxmi wanted to know more about it and upon enquiring, she realized that it was a convenient option for earning some extra money for the family.

Initially, there was some hesitation from her mother-in-law and husband, however Laxmi convinced her family to support her in the dairying activities.

Since agriculture was climate and resources dependent; the agriculture earnings were not stable for the family to solely rely upon. But after enrollment with the DCS, Laxmi earns enough to cover the daily household expenses. After witnessing the earnings from selling milk to the dairy, her mother-in-law also started helping in dairying work with Laxmi.

Current Scenario

The family's income has increased substantially with the monthly income being approximately Rs.12000-15000 now.

Laxmi increased her earnings from dairying activities and is now able to fund a major part of the household activities. Over a time, the family purchased more cows and now own 4 cows. These four cows give around 40 liters of milk every day, which is sold at the dairy cooperative.

Case Study-33

Bhagamma – Thippenahalli, Kolar, Bangalore

EIA Name- Kolar

Enrolled under DCS – Thippenahalli

Background

Bhagamma, aged 40, lives with her husband and son in Thippenahalli village of Kolar district in Bangalore. Bhagamma and her husband are both involved in agriculture as well as dairy farming.

Problems Faced

Since Bhagamma had only a cow, the earning from dairy farming was very less. The quality and quantity of milk was also poor as they were unable to pay full attention to dairy farming since they were also engaged in agricultural activities.

The agricultural labor did not yield a high earning both because agriculture is a labor-intensive job and Bhagamma and her husband were the only people working on their fields. Thus, they are not able to reach their maximum potential.

Bhagamma and her husband used to put many hours in the dairy farming but were incapable in reaping sufficient benefits from it. They were demotivated and did not wish to continue dairy farming in the future.

Impact of Dairy Cooperative Society

Bhagamma and her husband heard about the awareness sessions provided by the dairy cooperative society from their neighbors and wanted to avail the benefits themselves too. They enrolled themselves at the dairy cooperative society and attended the meetings and knowledge sessions.

The Ration Balancing Program (RBP) provided the awareness to the villagers on matters like the nutrition requirement of milch animal, type, quantity & quality of food that should be given and other such dairy related awareness sessions. Bhagamma started receiving ration advice from LRP and implemented on her milch animals.

Bhagamma and her husband also learnt about Artificial Insemination (AI) in during such sessions and meetings. Although they are yet to implement the technology, they are optimistic that there will be a positive impact on the productivity of milch animal.

They have also availed the vaccination facility and veterinary services from the dairy for their cow.

Current Scenario

Today, Bhagamma and her husband sell approximately 18-20 liters of milk everyday earning around Rs.15, 000 every month. They have invested in their agricultural work and are now earning Rs.5, 000 per month from it.

The awareness sessions received at the dairy cooperative helped them increase the quantity as well as improve the quality of the milk. There has also been an increase in the fat content of the milk.

They are now able to fulfill all the requirements of the household and also pay for their son's education. They are earning a little extra and saving it to be used during contingencies.

There has been an overall increase in the standard of living of the family due to the implementation of the knowledge from the awareness sessions and the fair payments received from the dairy cooperative society.

Case Study- 34

Satyadev Varma -Bhausi, Rae Bareli

EIA Name – Lucknow

Enrolled under DCS – Bhausi

Background

Satyadev, aged 52, is a resident of Bhausi village in *Rae Bareli* District of Uttar Pradesh. He lives in a joint family and has three children. Currently, the family own 4 cows, which produce milk that is sold at the village milk collection center.

At the time when dairy cooperative society was established in the village, the family owned no milch animal or farmland.

Problem faced

Previously, the family did not have any milch animal and no agricultural land. This resulted in limited earning for the family from agricultural labour, which was not sufficient to meet the requirements of the whole family.

Impact of Dairy Cooperative Society

After the coming of the dairy cooperative society to the village, Satyadev and his family bought a buffalo from their limited savings. They then started selling milk to the dairy on regular basis. The earnings accrued from selling milk were used to buy more animals and sell more quantity of milk thereby leading to higher revenue.

The steady and rising income enabled the family to buy an agricultural land of 5 Bighas in the nearby area. This helped them in diversifying their income. Over time, the family has been able to build their own house and marry the children using the income earned from dairying activities.

Current Scenario

Satyadev and his family were awarded with "Gokul Puraskar" and Rs.11000 from the Government for consecutively three years for contributing maximum amount of milk in the district. Today, the family owns 4 cows which produce approximately 30-40 liters of milk every day. The monthly income of the family is around Rs. 15,000-20,000 which is sufficient enough to meet their requirements and take proper care of the milch animal.

Case Study-35

Suman Devi– Bedaru, Rae Bareli, Uttar Pradesh

EIA Name – Lucknow

Enrolled under DCS – Bedaru

Background

Suman Devi, aged 35, lives with her husband in Bedaru village of Lucknow district. Both of them are involved in agriculture as well as dairy farming.

Problems faced

Previously, Suman and her husband had only 2 cows, which produced milk that was sold at a private dairy. The produce from the two cows was quite low which led to lesser payment and income for the family.

Suman and her husband planned on expanding their agricultural work in the future to earn higher income but were not able to do so because of shortage of capital.

They used to sell the entire produce to a private dairy. Their neighbors suggested that they should sell half of their produce to the dairy cooperative society to measure the difference in payments between the two dairy. This way they also learnt about the awareness sessions provided by the dairy staff.

Impact of Dairy Cooperative Society

Getting involved in dairying activities helped Suman to improve her family income. The family did not have to depend on agricultural income which was not only unstable but also work was laborious.

The income from dairying helped the family in improving their standard of living. As a family of two has fewer needs she earned enough money from dairying to meet the household need and was still able to save money for the future.

Current Scenario

Presently, Suman owns 5 cows which gives around 10-13 liters of milk every day which is sold at the dairy cooperative as well as to private dairy. The monthly income from dairy farming is approximately Rs. 6000 while that from agriculture is Rs. 2500. Suman and her husband are saving money to expand their agricultural activities. Today, they own around 2.5 bighas of cultivable land.

Suman believes that with the help of dairy cooperative society there has been an improvement in her family's standard of living. Suman and her husband are now motivated to work harder to build a bright future for their selves.

Case Study-36

Geeta Devi– Bhausi, Rae Bareli, Uttar Pradesh

EIA Name – Lucknow

Enrolled under DCS – Bhausi

Background

Geeta Devi, aged 49, lives with her husband, son and daughter-in-law in Bhausi village in Uttar Pradesh. The primary occupation of the family is dairy farming followed by agriculture.

Problems Faced

The income generated from dairy farming as well as agriculture was not sufficient to meet the growing needs of the household. Since the family owned only two cows previously, the production was less which led to limited earnings.

With only two working members in the family, the income earned was not adequate to meet all the requirements of the household.

The family owns agricultural land but was unable to optimize the production on it due to lack of proper machinery and inputs such as fertilizers and pesticides. Due to low earnings, there were no savings to buy the required inputs.

Impact of Dairy Cooperative Society

After learning about the dairy cooperative society, Geeta Devi started attending the meetings and awareness sessions. The Ration Balancing Program (RBP) provided knowledge to villagers relating to the nutrition requirement and balanced food that should be given to milch animals. This helped her to understand the food requirements of her milch animal. LRP visited her house and started providing regular ration advice for her milch animals.

Geeta Devi also received vaccination and accessed the veterinary facility for her milch animal.

Current Scenario

Today, Geeta Devi owns 4 cows and sells approximately 25-30 liters of milk every day. The awareness sessions received at the dairy cooperative has helped in increasing the quality as well as quantity of milk. There has also been an increase in the fat content present in milk.

There has been an overall improvement in the standard of living of Geeta Devi's family due to ration balancing program. She strongly encourages other women of the village to take benefits dairy services available to them.

Case Study-37

Suman – Chandapur, Lucknow, Uttar Pradesh

EIA Name – Lucknow

Enrolled under DCS – Chandapur

Background

Suman, aged 45, lives with her husband and five children in Chandapur village of Lucknow district in Uttar Pradesh. The main occupation of Suman and her husband is agriculture labor and dairy farming.

Problems Faced

Suman and her husband have to provide for the needs of their five children all by themselves. It becomes difficult for them to support education of all their children. The children are too young to support the family through work.

Presently, the family owns a cow; Suman and her husband plan to buy another cow in near future but are facing financial constraints in doing the same. They want to purchase another animal so that there can be a raise in the household income and meet all the household requirements.

Suman does not want to take a loan to pay for the education of her children or to buy a new animal as she believes it becomes difficult to repay. Hence, she decided to enroll in the dairy cooperative society so that she could receive awareness sessions regarding dairy farming and earn higher income from the given resources.

Impact of Dairy Cooperative Society

Suman along with her husband attended awareness sessions at the dairy cooperative society where they learnt about methods to maintain milch animal's health and their milch animal shed and information regarding their nutritional requirements.

They also received vaccination facility and veterinary services for their cow which resulted in better health of the cow. This was observed through an increase in the quality and quantity of milk given by it. There has also been an increase in the fat content present in milk.

Current Scenario

With the awareness sessions attended at the dairy cooperative society meetings, Suman and her husband adopted modern methods of maintaining the cowshed and feeding their cow. They earn around Rs. 2000 per month from dairy farming and around Rs. 1000 per month from agricultural activities. They are slowly witnessing an increase in their monthly income and are hopeful that over time they will have sufficient savings to buy another animal.

Suman and her husband are now able to pay for their children's education and meet all other household expenditures.

Case Study-38

Rani– Dahi Gawan, Rae Bareli, Uttar Pradesh

EIA Name – Lucknow

Enrolled under DCS – Dahi Gawan

Background

Rani, aged 40, lives with her family in a pucca house in Dahi Gawan village in Uttar Pradesh. She has never attended school and does not know how to read and write. Her family own two milch animals.

Problems Faced

Since Rani has not attended school, it is difficult for her to adapt to new technologies and methods that are brought in dairy farming. These new methods help in increasing the

productivity of milch animals thereby increasing the quality and quantity of milk produced. Thus, owing to her illiteracy, she is unable to optimize the production of milch animal leading to lesser income generation.

Rani learnt about farmers' meetings on various aspects of milk production and dairying offered by dairy cooperative society from other women of the village who informed her about the benefits they received from attending these sessions. She decided to get herself enrolled in the dairy and attend the such meetings and sessions.

Impact of Dairy Cooperative Society

On enrolling with the dairy cooperative, Rani received information regarding the basic functioning of dairy farming and new methods available. She learnt about methods of feeding, rearing and cleaning the milch animal, maintaining healthy environment for them and about Artificial Insemination (AI) technology.

Rani has also made use of veterinary services available at the dairy cooperative. She also availed vaccination facility for her milch animal. This has benefitted in maintaining health of her cow.

Current Scenario

Today, Rani owns 2 cows and sells around 10-12 liters of milk every day and earns approximately Rs. 8000 every month. The family earns around Rs. 2500 from agricultural activities per month.

The family has 4 bighas of cultivable land and is planning to expand their agricultural activities. Rani and her family firmly believe that the reason behind an increase in their standard of living is the awareness sessions she received at the dairy cooperative. Today, she encourages other women of her village to enroll with the dairy cooperative.

Case Study-39

JasvinderKaur – Dhalian, Punjab

EIA Name –Ludhiana

Enrolled under DCS – Dhalian

Background

JasvinderKaur (41 years) of Dhalian village lives with her husband and two children. Jasvinder's husband is engaged in agricultural activities while she works in dairy farming.

Problems Faced

Jasvinder's family had a steady income from dairying and agricultural activities. However, they were unable to meet the increasing transportation costs incurred in selling their agricultural produce to bigger cities.

Additionally, the family wanted to expand their agricultural business for which they required additional capital.

Impact of Dairy Cooperative Society

Jasvinder and her family had sufficient income from agricultural and dairying activities to meet their household expenses. With the dairy cooperative now operating in the village, it has strengthened family's financial status. The knowledge received from LRP about the RBP helped Jasvinder to understand about methods and techniques of feeding the milch animal, keeping the environment clean and healthy and information regarding other dairy related activities.

Current Scenario

The adoption of RBP services has enabled Jasvinder and her husband to meet the transportation expenses incurred in agricultural work, buy tempo required for transportation of goods and

provide quality education to their children. This has been made possible only because of the steady income they received from the cooperative.

Over the years, Jasvinder's family has been able to expand their agricultural business and increase the production.

Case Study-40

Jasbir Kaur - Dhalian, Ludhiana

EIA Name – Ludhiana

Enrolled under DCS – Dhalian

Background

Jasbir Kaur aged 41, is a resident of Dhalian village in Ludhiana District of Punjab. She lives in a nuclear family and has two children. Currently, the family owns 3 buffalo and the produced milk is sold at the village milk collection center.

Jasbir and her husband are both involved in dairy farming which acts as the additional source of income for the family apart from agriculture activities

Problem faced

Jasbir Kaur and her family have been engaged in farming activities past many years. But slowly and gradually their agriculture income started falling over the years. So they didn't much rely on agriculture income. In the past, it was difficult for them to meet all the household expenses and support their children's education through one single source of income.

Impact of Dairy Cooperative Society

With the Dairy Cooperative Society (DCS- Dhalian) being setup in the village, Jasbir got interested in selling milk at dairy cooperative society. At that time they only had one milch animal and used to sell around 6-8 liters of milk per day. And they were getting around Rs. 5000 per month. But it was not enough for them, so they bought 2 more buffalos by taking loan. By this they were able to increase quantity of milk they sold at dairy cooperative society. The dairy cooperative has led to an increase in their income levels.

The Ration Balancing Program (RBP) awareness sessions provided her information regarding measures which should be adopted to ensure higher productivity and quality of milk. She contacted LRP and started taking ration advice regularly. While following ration advice, the health of the milch animals also improved, which ultimately contributed in increase in milk productivity.

Current Scenario

The ration balancing helped the couple to increase production capacity of the milch animal thereby leading to an increase in the output as well as the income of family. Jasbir and her husband are now able to provide quality education to their children.

Case Study-41

Sarjeet Kaur - Dhalian, Ludhiana

EIA Name – Ludhiana

Enrolled under DCS – Dhalian

Background

Sarjeet Kaur aged 75, is a resident of Dhalian village in Ludhiana District of Punjab. She lives in a joint family

with her son, daughter-in-law and her two grandsons. At present, the family owns 2 buffalos whose milk produce is sold at the village milk collection center.

Problem faced

Sarjeet Kaur's family was dependent on the income generated through agricultural activities. Since they own agricultural land they were not involved in any other profession. Earlier they didn't even have a pakka house.

Impact of Dairy Cooperative Society

Sarjeet Kaur was engaged with dairying for many years. She was selling milk at a private dairy before dairy cooperative society was setup in her village. At that time they had just one milch animal. But after the establishment of the dairy cooperative society they were able to buy another buffalo and increased quantity of milk sold at the dairy cooperative society. Sarjeet Kaur wasn't able to attend all the meetings which were organized at dairy center but she would get updated on the information about dairy activities and animal healthcare by her family members. She later on subscribed the membership of the dairy society and started participating in dairy activities. Through this she was able to take care of milch animal better and be more active at her age. From the dairy income their family was able to build their own "Pukka" house and they also bought one more buffalo.

Current Scenario

The dairy cooperative has ensured a steady income for the family. With the savings accumulated over the years, the family is able to provide for children's education and live in a pukka house. Sarjeet is involved in most of the dairy related activities at the age of 75 and is happy continuing them.

Case Study-42

Sarjeet Kaur - Bharthala, Ludhiana

EIA Name – Ludhiana

Enrolled under DCS – Bharthala

Background

Jasvinder Kaur aged 35, is a resident of Bharthala village in Ludhiana District of Punjab. She lives in a joint family and has two children. Currently, the family owns 5 cows and the milk produced is sold at the village milk collection center.

Most people in her family are engaged in agriculture activities along with dairy activities.

Problem faced

Jasvinder's family had a poor financial condition. Her family wanted to improve their livelihood and to give their children better education and health for elder family members. But because of poor financial condition they were not able to take a loan. They used to sell milk at a private dairy, outside the village. This was not giving them proper income, as per measured fat content in the milk, and also the payments were not timely.

Impact of Dairy Cooperative Society

With the Dairy Cooperative Society (DCS- Bharthala) being setup in the village, Jasvinder Kaur started selling milk to it. She involved herself in dairy activities and meetings. This helped her to increase milk productions and has led to higher monthly income. The income has helped the family in improving their standard of living.

Relying on the dairy income, Jasvinder's family had taken a loan of Rs. 2 lakhs and was able to repay it. The family has been able to buy additional cows from the income leading to an increase in the quantity of milk.

Current Scenario

Jasvinder Kaur's family has improved its financial status in village and also their standard of living. Further, her family is able to save around Rs. 7000 to 9000 every month after paying for all the household expenses; thereby strengthening their financial and social status.

Case Study-43

Harjinder Kaur – Bharthala, Punjab

EIA Name – Ludhiana

Enrolled under DCS – Ludhiana

Background

Harjinder Kaur (58 years) of Bharthala village lives with a family of four members. All the members are engaged in agricultural and dairying activities.

Problems Faced

Previously, the family owned a cow and a buffalo. The production capacity was low due to lesser number of milch animals owned by the family. Because of which, the family was unable to meet their household expenditures and expand the production capacity.

The family used to sell their produce to a private dairy. However, the private dairy used unfair practices in measuring the fat content of milk, which gave them lower returns, and over and above the payments were usually delayed.

Impact of Dairy Cooperative Society

The dairy cooperative has helped in increasing the income of the family by providing timely and fair payment for the produce. Harjinder was able to purchase more milch animals from the increased income. This has resulted in an increase in the quantity of the milk produced. Harjinder is now able to meet the fodder expenses of milch animal from the same income and is also able to save for future contingencies.

The cooperative pays fair payment for the produce and the payment is made on time. This has resulted in a steady income for the family.

Current Scenario

Today, Harjinder and her family own 2 cows and 3 buffaloes. They sell almost 25-30 liters of milk every day. The family has witnessed an improvement in their standard of living.

Case Study- 44

Jasbir Kaur – Dhalian, Ludhiana

EIA Name – Ludhiana

Enrolled under DCS – Dhalian

Background

Jasbir Kaur, aged 40, is a resident of Dhalian village in Ludhiana District of Punjab. She lives in a nuclear family and has three children. Currently, the family owns a buffalo.

Problem faced

Jasbir Kaur's family was facing many problems. Her husband didn't work and thus the entire burden of earning a living fell on Jasbir. Her husband was not supporting her in the struggles.

Jasbir Kaur had one buffalo earlier and they are got very little milk from it. She sold around 4 to 5 liters milk per day at that time. Earning from dairying was insufficient to cover daily expenditures. For Jasbir, handling agricultural and dairying activities alone was getting difficult and unmanageable.

Most of the time she was engaged in dairy activity or animal husbandry, but as she owned only one milch animal and she didn't get much income from it.

Impact of Dairy Cooperative Society

With the Dairy Cooperative Society (DCS- Dhalian) being setup in the village, she observed women getting involved in dairying activities and benefitting from it, this motivated her to sell milk at dairy cooperative society. This gave her additional money. Thus she started working more with extra efforts in dairy related activities. She also took more interest to learn about taking care of animals, efficient dairying practices and animals' health related information.

With the rise in her income, Jasbir has been able to buy another buffalo and has increased the quantity of milk she sold to the dairy. By these she was able to generate more income from dairy, and able to manage her household expenses.

Current Scenario

Currently Jasbir Kaur does all the dairy related activities by her own self and takes care of most of the household expenses solely. Her family now owns two buffalos and sells around 10 to 12 litter milk per day. She is totally dependent upon dairy income for managing her household and family expenses. She is now also able to give an education to her children.

Case Study- 45

Parmjeet Kaur – Bajheri, Punjab

EIA Name – Ropar

Enrolled under DCS – Bajheri

Background

Paramjeet Kaur (38 years) lives in Bajheri village with her family of 5 members. The family owns 3 buffalos.

Initially, the family faced financial issues because of which there were no savings to meet household's everyday requirements. The children were unable to pursue quality education because of financial constraints.

Problems Faced

Paramjeet's family owned agricultural land however, there was no cultivation being done on it. Due to low earnings, the family could not afford necessary machinery and inputs (such as seeds, fertilizer etc.) to start agricultural activity.

Initially, because the family owned just 1 buffalo, the earnings received from the dairy were limited and not sufficient to fulfill needs of the household.

Impact of Dairy Cooperative Society

After the establishment of dairy cooperative society in the village, Paramjeet and other members of her family got involved in dairy farming. They received awareness about from Ration Balancing Program (RBP), where the villagers were adviced about methods and techniques of improving the quality of milk and productivity. LRP visited her house ad told about the benefits of RBP. The family adopted these measures that resulted in an increase in the fat content in the

milk and improvement in the overall health of the milch animal thereby leading to an increase in family income.

Current Scenario

Over the years, the financial condition of Paramjeet's family has improved. Today, the family owns 3 buffaloes and 2 tractors. They have accumulated enough savings to start cultivating the agricultural land thus diversified their income.

Paramjeet's husband and brother-in-law have moved to bigger cities to pursue business opportunities. Paramjeet believes that this rise in the family's standard of living has been made possible only by the awareness sessions and guidance she received from the dairy staff.

Case Study-46

Nirmala Devi – Bajheri, Punjab

EIA Name – Ropar

Enrolled under DCS – Bajheri

Background

Nirmala Devi, aged 62, lives in Bajheri village with her family of 6 members. Her family had limited milch animal because of which their monthly earning was also limited.

Problems Faced

Initially, Nirmala Devi had limited number of cows. Due to financial constraints, she was unable to purchase more milch animal. There was no other source of income.

Due to this, Nirmala Devi's family had no savings as the income generated from dairying activities was utilized to meet the household expenditures. During some months (especially

during festivals or marriage in close family), the income was not sufficient to meet the additional requirements of the family.

Impact of Dairy Cooperative Society

With the setup of dairy cooperative in the village, Nirmala Devi received fair earnings for the produce which increased her overall income. The dairy cooperative paid according to the fat content present in milk. There was no delay in payment for the produce. With the increased income, Nirmala Devi was able to buy more animals and increase the quantity as well as quality of milk. This increase in income also led to higher savings for the family which can be used during contingencies.

Current Scenario

Over the years, Nirmala Devi accumulated sufficient savings to invest in gold jewelry, improving her economic status. Today, her family owns 2 cows and 3 buffalos. Nirmala Devi sells approximately 25-30 liters of milk to the dairy every day.

The family has also bought 4 bighas agricultural land where they cultivate various crops. This acts as an additional source of income for the family.

Case Study-47

Ravinder Kaur – Sakandarpur, Punjab

EIA Name – Ropar

Enrolled under DCS – Sakandarpur

Background

Ravinder Kaur, aged 50 years lives in Sakendarpur village in Punjab with her husband and son. All the three members are engaged in dairying farming and agricultural labour.

Problems Faced

Before the dairy cooperative was setup in the village, Ravinder used to sell the milk produce at a private dairy. However, the owner of the dairy used unfair practices in measuring the fat content in milk. This resulted in lower payment for the produce. Ravinder and her family were aware about his activities however, they did not have any other market to sell the milk.

Hence, they continued selling milk at the private dairy.

Impact of Dairy Cooperative Society

With the opening of dairy cooperative in her village, Ravinder's family witnessed an increase in their earnings as they received fair payment from the dairy for their produce.

Ravinder also attended briefing sessions from the dairy under Ration Balancing Program (RBP) where the villagers are taught about the food requirement of milch animals, ways and methods to ensure higher productivity of milk and other dairy related activities.

Through these awareness sessionss, Ravinder witnessed an increase in the quantity as well as the quality of milk given by her milch animal.

Current Scenario

With the increased income, Ravinder's family was able to take loan of around Rs. 25,000 to meet various expenditures, such as purchase of new milch animal, procuring nutritious fodder for the milch animal and the income from dairy farming has made it easier for them to repay their debt.

Today, Ravinder owns 2 buffalos and has bought 6 bighas of land for cultivation. She believes that without the help of dairy staff and her family, she would not have been able to witness such

growth in their standard of living. Ravinder now encourages other families in her village to register with the dairy so that they can also benefit from the meetings and awareness sessions.

Case Study-48

Harjit Kaur - Padiala, Ropar

EIA Name – Ropar

Enrolled under DCS – Padiala

Background

Harjit Kaur, aged 38, is a resident of Padiala village in Ropar District of Punjab. She lives in a nuclear family and has one child. Currently, the family owns one cow and one buffalo.

Harjit's family income was adequate to run the house. They also own cultivable land. So they are mainly engaged in agriculture activity along with the dairy farming, which provides them with an additional source of income.

Problem faced

Harjit Kaur and her husband, both are engaged in agriculture activities. They get sufficient income from it to run household expenditures

Since sometime they were not able to improve the quantity and quality of milk produced by their milch animals. This was deterring them from improving their standards of living and leading a more comfortable life.

The couple has had primary education but the lack of knowledge in improved dairying methods and techniques caused hindrance in performance of their dairying activity.

Impact of Dairy Cooperative Society

With the Dairy Cooperative Society (DCS- Padiala) being setup in the village, Harjit Kaur and her family saw other people of village getting involved in dairying activities. This motivated them to join the dairy cooperative society and also to sell the milk produce to the cooperative.

By these activities they got more informed about dairy farming and animal health care. In no time, they were able to increase fat content of the buffalo's and cow's milk along with the increase in the quantity of milk produced. They have now been able to increase the dairy income as well as buy more milch animal.

They sell around 15 liters at dairy cooperative society daily, and earn between Rs. 8000 to 10000 per month.

Current Scenario

Hajit Kaur and her family are able to improve their income because of dairying. They are also planning to buy more milch animal.