Impact Assessment and Evaluation of Ration Balancing Program in the Southern Region

Submitted to

National Dairy Development Board (NDDB)

Institute of Rural Management Anand
Anand, Gujarat-388001

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Report

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Project Management Unit, NDP-I

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ABBREVIATIONS

AI   Artificial Insemination

APL   Above Poverty Line

ASHA   Accredited Social Health Activist

ATE   Average Treatment Effect

ATT   Average Treatment Effect on Treated

BAMUL   Bengaluru Urban, Bengaluru Rural and Ramanagara Districts Co-Operative
            Milk Producers Societies Union Ltd.

BPL   Below Poverty Line

DCS   Dairy Cooperative Societies

EIA   End-Implementing Agency

FGD   Focus Group Discussion

HH   Household

IDA   International Development Association

IE   Impact Evaluation

INAPH   Information Network for Animal Productivity and Health

IV   Instrumental Variables

LRPs   Local Resource Persons

M&E   Monitoring and Evaluation

MGNREGS   Mahatma Gandhi National Rural Employment Guarantee Scheme

MPI   Milk Producer Institution

MRCMPU   Malabar Regional Co-operative Milk Producers' Union

MT	Million Tonnes
NDDB	National Dairy Development Board
NDP	National Dairy Plan
NITI	National Institution for Transforming India
NRLM	National Rural Livelihood Mission
OBC	Other Backward Class
PPP	Purchasing Power Parity
PSM	Propensity Score Matching
RBP	Ration Balancing Program
RDD	Regression Discontinuity Design
SC	Schedule Caste
SHG	Self-Help Group
SNF	Solid Not Fat
ST	Schedule Tribe
STEP	Support to Training and Employment Program
VAP	Village Awareness Program
VRPs	Village Resource Persons

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EXECUTIVE SUMMARY

The Indian dairy sector has registered significant growth during last four decades. Milk production was 22 million tonnes (MT) in 1970, 95 MT in 2008 and surpassed 146 MT in 2015. 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. India also has the maximum number of cows and buffaloes in dairy production: about 300 million, out of which 127 million are adult breed-able females. India is not only a leading milk producer but is also the largest consumer of milk in the world. While the annual milk production is growing at 3.3%, consumption is growing at 5% leaving a significant gap between the demand and supply. Emerging trends indicate that milk demand is likely to reach 155 MT by 2016-17 and between 200-210 MT by 2021-22. Therefore annual milk production has to increase by 6 MT over next 15 years as compared to 3 MT at present, in order to meet the domestic consumption.

In order to address these challenges, the National Dairy Plan (NDP) is designed as scientifically planned multi-state initiatives to increase milk production by increasing milch animal productivity through a focused approach to breeding and feeding. The Ration Balancing Program (RBP) is a critical sub-component of the NDP-I program which has been designed with the objective of attaining higher productivity of milch animals through feeding them a balanced diet. Balanced diet which includes required nutrients, would allow animal to produce milk commensurate with its genetic potential. One of the important objectives of RBP is to create awareness amongst milk producers on optimization of animal feeding by efficient utilization of locally available feed resources at the possible least cost.

The primary objective of the research study is to conduct impact evaluation of RBP in terms of changes in milk-yield, feed cost, reporting, animal health, use of mineral mixture, frequency of artificial insemination and monitoring systems and institutional capacity building. The study was conducted in the two southern states of Kerala and Karnataka. Household level survey was canvassed in 40 villages to 1000 households (500 RBP and 500 non-RBP households). In addition to that, 10 case studies were conducted with project beneficiaries to document success stories. The study team extensively interviewed the two End-Implementing Agencies (EIAs) in Kerala and Karnataka, namely: Malabar Regional Co-operative Milk Producers' Union (MRCMPU) and Bengaluru Urban, Bengaluru Rural and Ramanagara Districts Co-Operative Milk Producers Societies Union Ltd. (BAMUL) respectively. This was done to assess the use of INAPH for record keeping, identify bottlenecks, if any, in the implementation of RBP, and document innovative EIA practices with respect to RBP implementation and its sustainability.

The household level data were analyzed using micro-econometric methods such as qualitative response models and propensity score matching method. Results indicate that the RBP households have statistically higher annual income (INR 142712) in comparison to non-RBP households (INR 125594). Similarly, average monthly expenditure is higher in RBP households (INR 9341) as compared to non-RBP households (INR 8092). RBP households on an average own 1.61 cows as compared to 1.40 in non-RBP households. The participation model indicates that the program has been well targeted, that is, program has attracted small, medium, and large farmers alike. There is strong evidence that uneducated farmers were not left behind given that they are equally likely to participate as educated farmers.

EIAs have used several methods to promote the RBP program. This includes, village awareness programs, distribution of pamphlets, displaying banners and posters on RBP, screening of documentary film, etc. The estimates from the program participation model indicate that documentary films, posters/banners, and pamphlets had a significant positive effect on program take up. The most successful method turns out to be distribution of pamphlets. However the village awareness program did not result into positive outcomes from the point of view of program targeting.

Propensity score estimates provide statistical evidence that effect on average milk yield is positive but small. However when we account for lactation stage of RBP animals at the time of joining the program, the difference is large and significant: animals who received RBP in early stages of their lactation produced 520 ml/day more as compared to animals in the midst of their lactation, while late stage animals produced 380 ml/day less than the middle category. Peak yield for RBP is 13.52 liters/day as compared to 11.08 liters/day for non-RBP animals. The difference of 2.44 liters per day can be attributed to RBP program. The program had a positive impact on the number of inseminations required for conception. One out of every three RBP animal required one less insemination comparable unit.

1. Introduction

A recent report from the World Bank suggested that India is one the fastest growing economy in the world. In terms of its purchasing power parity (PPP), India stands as third largest economy, after US and China[1]. Despite the economy growing at such high rate, the benefits from these economic developments haven't reached the poor sections of the country. In the last two decades, the Indian government has focused more on inclusive, equitable and sustainable economic development. Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) is one of its few schemes with inclusiveness as its primary target. The recently established NITI Aayog (National Institution for Transforming India), Government of India, included integrating villages into the development process, inclusion of the vulnerable and marginalized sections and sustainability at the core of the planning and development in its seven guiding principles. 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 Gross Domestic Product (GDP) in 2013-14 at 2004-05 prices. Also, agricultural exports constitute a fifth of the total exports of the country.

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[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 has experienced a significant growth during the last four decades plays a crucial role in agriculture GDP. 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 bovine 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 supply6. 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 2021-2027. 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 breed 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

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[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 (NDDB) and its subsidiaries for providing technical and implementation support to the project[10].

1.1 National Dairy Plan I

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

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

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

1.2 Ration Balancing Program

Ration Balancing Program (RBP) has been designed to:

(a) increase milk productivity

(b) reduce cost of milk production

(c) reduce methane emission through feeding them a balanced diet.

The balanced diet includes required nutrients that would allow animal to produce milk commensurate with its genetic potential. Research and field trials indicates that this approach to feeding has the potential to increase milk yield, reduce cost of milk production, and contribute to reducing methane emissions. Milch animals are usually fed one or two locally available

concentrate feed ingredients, grasses and crop residues. This often leads to an imbalanced ration – resulting in proteins, energy, minerals and vitamins being either in excess or deficient. Imbalanced feeding adversely impacts not only the health and productivity of animals but also affects income from milk production since an estimated 70 per cent of the total cost of milk production is contributed by feed. The objective of RBP, a sub project plan of NDP I, is to create awareness amongst the milk producers on optimization of animal feeding by efficient utilization of locally available feed resources at the possible least cost.

RBP is primarily an extension service wherein advisory support would be provided to dairy farmers at their doorstep, via trained Local Resource Persons (LRPs). The project aims to demonstrate a new approach to extension by underlining the importance of unique identification of animals, their performance measurement and advisory support at farmers' doorstep. It is envisaged under the project that each animal covered under RBP would be uniquely identified with an ear tag so as to enable monitoring of its productivity as well as efficiency of RBP through data to be fed into a performance recording system. Proper and effective training is the key for successful countrywide implementation of ration balancing program (RBP) envisaged under NDP I. The technical officers, animal nutritionists and trainers of end implementing agencies (EIAs) would be trained at NDDB who in turn would impart training to LRPs at EIA level.

LRP would ear tag the animals, record animal profile as well as current feeding practices and then give a least cost balanced ration advice to the farmer with the help of ration balancing application of Information Network for Animal Productivity and Health (INAPH) software.

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LRPs would also educate dairy households on latest technologies such as feeding milch animals with bypass protein, bypass fat, area specific mineral mixtures, enriched crop residues, etc. Dairy farmers would be informed about the importance of drinking water, chaffing fodder, de-worming, vaccination, timely insemination, etc.

The LRPs would report to a technical officer cum animal nutritionist. The technical officers would work under the project coordinator at the EIA level. The overall operations will be guided by the RBP Management Committee which will be chaired by the Chief Executive Officer (CEO) of the concerned EIA. It is expected that the RBP component of the NDP I program would cover about 2.7 million milch animals in 40,000 villages using the services of about 30,000 LRPs.

The RBP intervention is expected to achieve the following:

a) Proper use of locally available feed resources to balance the ration of animals at least cost

b) Increases milk production with more fat and solids-not-fat

c) Helps increasing the net daily income

d) Improves reproduction efficiency

e) Helps reducing inter-calving period, thereby increasing the productive life of animals

f) Improves the general health of animals

g) Improves the growth rate in growing calves, leading to early maturity

1.3 What is this report about?

The Project Management Unit, NDDB commissioned this study to evaluate the impact and assess intervention specific effectiveness of Ration Balancing Program on increase in milk productivity and reduction in feed cost.

The objectives of the study are:

- To evaluate the intervention-specific effectiveness of RBP in terms of increase in milk-yield and/or, reduction in feed cost besides delivery of services, record keeping, reporting & monitoring systems and institutional capacity building from 1st April, 2012 to till date.

- To assess the institutional and financial performance of DCSs/ Milk Producer Institutions (MPIs) and EIAs, use of the information technology (INAPH/MIS) for record keeping including the progress achieved by these institutions at different levels to provide services on a sustainable basis to the milk producers in the context of the RBP.

- To identify the bottlenecks, if any, in the implementation of this on-going program and take the remedial measures accordingly, for a successful completion by the end of the project period.

- To document the innovative practices followed by EIAs to implement and make the RBP sustainable.

The broad outline of the queries to understand the impact assessment and evaluation of the RBP grouped under relevant key objectives of the project are as follows:

(a) Effects and Outcomes: Assess To what extent has the program improved incomes of the beneficiary households in relation to the baseline status? Review and document the cost and benefits associated with adopting of Ration Balancing. Has the capacity of DCSs/MPI has improved in the process of delivering goods and services of the program to the beneficiary. With the implementation of this program, has there been an improved sense of the ownership for the stakeholders and what are their views on program implementation and progress?

(b) Effectiveness: Assess the efficiency of the program in attaining its goals and objectives. Review the factors that are impeding or facilitating the process for achieving these targets. Examine the program status with respect to target outputs in terms of quantity, quality and timeliness. Assess the monitoring and evaluation system that has been put in place to appropriately address the program's objectives and indicator targets. Also, evaluate the effectiveness of technical assistance that was provided throughout the program.

(c) Sustainability: Assess the mechanisms that have been put in place to ensure the sustainability of program results. Are there any differences in terms of sustainability of program output due to different profiles and gender of LRPs? After the completion of program, how likely are LRP's to continue operating and remain financially viable?

(d) Cross-cutting Issues: Evaluate the impact of the program on the livelihood of the women and the vulnerable group beneficiaries and their households. Has the capacity of households to mitigate environmental effects improves and had there been a scaling up in dairy activities? Further, examine the differences between genders of LRP in delivering the program in terms of gender of beneficiaries.

(e) Lessons learned and recommendation: Document the main lessons learned from the program experience since its inception. In particular, what has been central learning regarding the targeting and working experience with vulnerable households? Recommend corrective actions regarding the design, implementation, reporting, monitoring and evaluation of the program.

2. Research Methodology

2.1 Sampling Methodology

A multi-stage purposive sampling procedure was followed for identifying the treatment and comparison group households in the states of Karnataka and Kerala. The reason for using stratified sampling was to give representation to key stratum in the dairy population. The INAPH system was used to check the appropriateness of using stratified sampling strategy. It was observed that in both southern states, i.e., Kerala and Karnataka, the joining date of villages is well spread over the years 2013-15. Therefore it was essential to give representation to villages according to their date of joining of the program.

The stratified sampling procedure has also been found to perform better when it comes to identification of heterogeneous effects[11] of a program on outcomes. In the first stage two EIAs were chosen, one each from Kerala and Karnataka, as per the requirements of the study terms of reference (TOR).

In the second stage 20 villages from Karanataka and 19 villages from Kerala were identified using stratified random. Three strata were based on the date of joining (2013, 2014, & 2015) of the RBP program. In each village, on an average 25 households (13 treatment and 12 comparison households) were randomly selected. Approximately 500 households from treatment and similar number from comparison group households have been surveyed. The household survey was finally canvassed in 1007 households across the two states of Kerala and Karnataka. These details are summarized in the table below:

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[11] Heterogeneous effects are estimated at some level in the sub-population.

Table 2.1: Overview of Selected EIAs, Districts, Villages and Households

Selected States	Selected EIAs	Selected Districts	Selected Villages[12]	Selected Households	Program	Control
Karnataka	BAMUL	Bangalore Rural	20	508	253	255
Kerala	MRCMPU	Calicut	19	499	251	248

The TOR guidelines and study objectives have been studied to identify four broad research objectives of the study:

1) Impact evaluation of RBP on milk productivity and feed cost

2) Evaluation of M&E (monitoring and evaluation) systems meant for RBP implementation

3) Process evaluation of RBP implementation

4) Documentation of innovative practices followed by EIAs to make RBP sustainable

2.2 Quantitative Data Analysis

Development programs and policies are typically designed to change outcomes, for example in this case, enhancement of milk productivity and reduction in the cost of feeding per kilogram of milk production in the dairy sector. Quantitative data have been used to understand the effectiveness of the project strategies, stakeholders' perceptions and quantitative aspects of the impact of the intervention. In the absence of random assignment of program benefits (i.e. program is targeted), descriptive statistics and quasi-random econometric technique(s) has been be utilized to answer the evaluation question. The impact evaluation (IE) question that would be posed for the RBP interventions would be posed in the form of an equation:

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[12] Refer Annexure 1 for list of selected villages

$$\alpha = (Y|P = 1) - ((Y|P = 0)$$

α is defined as average impact of RBP on milk production and feed cost in the beneficiary/treatment group. It is interesting to note that the estimated average impact is the difference between the outcome variable Y (for instance: average daily milk production) with the RBP program (P=1) and the same outcome (Y) without the program (when P=0). If α estimates the causal impact of a capacity building program (P), we cannot observe the outcome Y after a beneficiary had participated in the program and also observe what would have happened to the beneficiary in the absence of the program. Since the program has actually taken place, the second part of the above equation is termed as counterfactual. Counterfactuals cannot be observed and are estimated through construction of credible comparison groups for RBP beneficiaries.

2.3 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, Focus Group Discussions (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. Impact Evaluation of Ration Balancing Program

3.1 Introduction

This chapter focuses on understanding the impact of Ration Balancing Program (RBP) on various aspects of milk production such as milk yield, cost of animal feed, animal health, use of mineral mixture, and frequency of artificial insemination. This chapter would also outline the effect of RBP program on related outcomes such as savings, feed cost, milk yield, insemination, animal health, use of mineral mixture, adherence to the recommendations made by LRP, and sustainability of the program in terms of making it chargeable.

The impact estimate of the RBP is done through descriptive statistics as well as matching methods: Propensity Score Matching (PSM).

3.2 Description of Program Impacts

3.2.1 Information on Social and Human Capital Resource Formation

Gender distribution of respondents from households (HHs) has been presented in the Table 3.1. Kerala and Karnataka both stood out in gender parity with higher percentage of women respondent in the survey from the treatment group, i.e. the household under RBP.

Table 3.1: Gender Distribution in Surveyed Households

Household interview	Kerala (n1=499)		Karnataka (n2=508)		Total (N=1007)	
	RBP HH	Non RBP HH	RBP HH	Non RBP HH	RBP HH	Non RBP HH
Interviews with men	91 (41%)	132 (59%)	86 (42%)	118 (58%)	177 (41%)	250 (59%)
Interviews with women	160 (58%)	116 (42%)	167 (55%)	137 (45%)	327 (56%)	253 (44%)

(Figures in parenthesis are proportions)

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 women contribute 64% to the total time that is spent on dairying, women's share is 64 per cent. Our sample is capturing this characteristic of Dairy sector very well.

Table 3.2 discusses the social and financial structure of surveyed households. Kerala is the only state in India to have high human development as per the United Nations (UN) norms: only 29% and 40% households in treatment and control group respectively are below poverty line in Kerala as against the high numbers in Karnataka (98% and 97%). Over all, there is no statistically significant difference in the distribution of BPL and APL households across RBP and Non-RBP groups, in respective states.

Table 3.2: Social Category of RBP and non-RBP Households (N=1007)

	Kerala		Karnataka		Total	
	RBP HH	Non RBP HH	RBP HH	Non RBP HH	RBP HH	Non RBP HH
Income category (BPL)	72 (29%)	98 (40%)	247 (98%)	247 (97%)	319 (63%)	346 (69%)
General	107 (43%)	120 (48%)	154 (64%)	149 (58%)	261 (52%)	269 (53%)
OBC	124 (50%)	107 (43%)	60 (24%)	57 (22%)	184 (36%)	184 (36%)
SC	17 (7%)	19 (8%)	34 (13%)	45 (18%)	51 (10%)	64 (13%)
ST	3 (1%)	2 (1%)	5 (2%)	3 (1%)	8 (2%)	5 (1%)

(Figures in parenthesis are proportions)

Social structures of the households do not present stark differences between RBP and Non- RBP households. Both Kerala and Karnataka display that dairying households primarily belong to the

General and Other Backward Class (OBC) category. Only 12 and 14 per cent of RBP and Non-RBP households are from the Schedule Caste (SC) and Schedule Tribe (ST) category. Similar trends were observed across the sample as well.

Education profile of the households presents an unsurprising picture. Almost half of the RBP respondents in Kerala have received primary education, while 43 per cent have completed higher secondary schooling. The same trend is observed in non-RBP households for Kerala. Similarly, the educational profile of respondents in Karnataka is very similar across treatment and comparison group.

Table 3.3: Educational Distribution (N=1007)

	Kerala		Karnataka		Total	
	RBP HH	Non RBP HH	RBP HH	Non RBP HH	RBP HH	Non RBP HH
Illiterate	7 (3%)	6 (2%)	69 (27%)	71 (28%)	76 (15%)	77 (15%)
Primary	124 (49%)	125 (50%)	62 (25%)	69 (27%)	186 (37%)	194 (39%)
Higher Secondary	108 (43%)	110 (44%)	115 (45%)	101 (40%)	223 (44%)	211 (42%)
Graduation & above	12 (5%)	7 (3%)	7 (3%)	14 (6%)	19 (4%)	21 (4%)

(Figures in parenthesis are proportions)

Over all, the education profile for RBP and Non- RBP households is alike making the control and treatment group similar.

3.2.2 Income and Durable Assets

The RBP households have statistically higher annual income in comparison to non- RBP households. One of the primary objectives of this report is to investigate the extent to which income differences can be attributed to RBP. However state-wise differences in the average annual monthly income, are not statistically significant. The overall difference in the sample is majorly brought by significant difference for Karnataka households. High standard deviations reflect the presence of outliers in the sample. Similarly, the average monthly expenditure is significantly higher for RBP households as compared to non- RBP households.

Table 3.4: Income and Expenditure

	Kerala		Karnataka		Total	
	RBP HH	Non RBP HH	RBP HH	Non RBP HH	RBP HH	Non RBP HH
Average Annual Income (Rs)	97795 (72742)	96435 (75744)	187269 (149005)	154754 (100692)	142712 (125534)	125594 (93668)
Average Monthly expenditure (Rs)	7269 (4467)	7001 (4817)	11363 (9361)	9162 (4625)	9341 (7635)	8092 (4838)

Figures in parenthesis are standard deviations of sample statistics

In the table 3.5, the land holding patterns and its various types are presented. On an average non- RBP households are observed to have statistically higher land holding as compared to RBP households at both state level and for the entire sample as well.

Table 3.5: Land Holding Patterns (N=1007)

	Kerala		Karnataka		Total	
	RBP HH	Non RBP HH	RBP HH	Non RBP HH	RBP HH	Non RBP HH
Average land holding (bigha)	.96 (0.79)**	1.29 (0.86)**	1.84 (1.7)**	2.23 (1.63)**	1.4 (1.49)**	1.8 (1.41)**
Cultivated Land	182 (73%)*	161 (65%)*	215 (85%)*	203 (80%)*	397 (79%)*	364 (72%)*
Fallow Land	9 (4%)*	5 (2%)*	6 (2%)*	2 (1%)*	15 (3%)*	7 (1%)*
Waste Land	2 (1%)*	3 (1%)*	18 (7%)*	10 (4%)*	20 (4%)*	13 (3%)*
Forest Land	4 (2%)*	2 (1%)*	1 (0%)*	16 (6%)*	5 (1%)*	18 (4%)*

*Figures in parenthesis are the proportional values of corresponding frequencies
**Figures in parenthesis are standard deviations of sample statistics

Overall, 79 and 72 per cent of RBP and Non- RBP households respectively hold cultivated land type. Others, i.e. fallow, waste and forest land constitute a marginal proportion of household.

3.2.3 Cattle Profile

RBP households on an average own 1.61cows as compared to 1.4 for non- RBP households. The difference is statistically significant at 95 per cent. This difference is also consistent at the state level. In Kerala RBP households have statistically higher number of cows in comparison to Non- RBP households. The difference buffalo ownership is not statistically significant.

Table 3.6: Animal Profile & Productivity (N=1007)

	Kerala		Karnataka		Total	
	RBP HH	Non RBP HH	RBP HH	Non RBP HH	RBP HH	Non RBP HH
Average number of milch animal (per HH)						
Cow	1.4 (1.05)	1.2 (0.55)	1.75 (1.04)	1.6 (0.98)	1.61 (1.06)	1.4 (0.82)
Buffalo	0.027 (0.24)	0.03 (0.19)	0.035 (0.241)	0.035 (0.205)	0.031 (0.242)	0.031 (0.2)
Yield (liters/day)						
Peak Yield	12.78 (3.61)	12.26 (4.24)	15.02 (4.99)	14.36 (5.13)	13.86 (4.47)	13.45 (4.87)
Average Yield	9.48 (3.67)	10 (3.72)	10.40 (3.91)	10.71 (4.12)	9.93 (3.81)	10.40 (3.96)

Figures in parenthesis are standard deviations of sample statistics

According to sample statistics, the average peak yield for non-RBP group is marginally higher than RBP group in both the states. This difference is statistically significant. The peak yield for RBP group is better than the comparison group. The inference based on descriptive statistics related to impact of RBP on milk yield must be checked for internal validity since milk production can be influenced by several factors apart from the program itself.

3.2.4 Fodder Management and Supply

Female adults of the household take lead in decisions pertaining to fodder management. Over 65 per cent in RBP households and 53 per cent non- RBP households, women decide and identify the feed requirements of milch animal. This trend is consistent in both the states.

Table 3.7: Feed Management and Dairy Income

	Kerala		Karnataka		Total	
	RBP HH	Non RBP HH	RBP HH	Non RBP HH	RBP HH	Non RBP HH
Decisions on Feed Management						
Adult male	91 (36%)	133 (54%)	104 (41%)	122 (48%)	195 (39%)	255 (51%)
Adult female	158 (63%)	115 (46%)	169 (67%)	150 (59%)	327 (65%)	265 (53%)
Children	4 (2%)	1 (0%)	4 (2%)	1 (0%)	8 (2%)	2 (0%)
Hired worker	1 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0%)	0 (0%)
Decisions on Use of Dairy income						
Adult male member	107 (43%)	134 (54%)	138 (56%)	148 (58%)	245 (49%)	282 (56%)
Adult female member	106 (42%)	81 (33%)	59 (23%)	61 (24%)	165 (33%)	142 (28%)
Both jointly	38 (15%)	33 (13%)	56 (22%)	46 (18%)	94 (19%)	79 (16%)

Figures in parenthesis are proportions

However we did not observe similar levels of women empowerment when it comes to the use of dairy income. In Karnataka, males take this decision in 56 percent of RBP households as compared to 58 per cent in non-RBP households. However, Kerala presents a different scenario where males alone take income use decisions in 43 per cent of RBP household and 54 per cent of non- RBP households.

Table 3.8 provides information on various sources of green fodder that are accessed by dairy farmers. Most of the green fodder is self-cultivated. Farmers cultivate green fodder on their own

land for self-consumption. This observation is consistent in overall sample as well. However, Kerala farmers rely on other sources as well such as market and fodder cultivated on leased land.

Table 3.8: Sources of Green Fodder

	Kerala		Karnataka		Total	
	RBP HH	Non RBP HH	RBP HH	Non RBP HH	RBP HH	Non RBP HH
Cultivated on Own	108 (43%)	95 (38%)	210 (83%)	201 (79%)	318 (63%)	269 (59%)
Purchased from market	37 (15%)	44 (18%)	1 (0%)	3 (2%)	38 (8%)	47 (9%)
Cultivated on Panchayat Land	0 (0%)	0 (0%)	10 (4%)	16 (6%)	10 (4%)	16 (6%)
Cultivated on Forest land	0 (0%)	0 (0%)	17 (7%)	27 (11%)	17 (7%)	27 (11%)
Cultivated on Lease land	20 (8%)	34 (14%)	57 (22%)	15 (6%)	35 (7%)	91 (18%)
Purchased directly from the owner and cutting himself	27 (11%)	0 (0%)	60 (24%)	0 (0%)	87 (17%)	0 (0%)

(Figures in parenthesis are proportions)

Kerala's reliance on other sources of green fodder other than cultivated on own land resonates with the facts related to availability of green fodder from own cultivated.

In Kerala, self-cultivation provides green fodder for only 3.45 months in RBP HHs (3.06 months in non-RBP HHs) as compared to 6.45 months in Karnataka. The overall average in this category is 4.96 months for RBP and 4.9 months for non-RBP HHs.

Table 3.9: Availability of Green Fodder in a year (in months)

	Kerala		Karnataka		Total	
	RBP HH	Non RBP HH	RBP HH	Non RBP HH	RBP HH	Non RBP HH
Average number of months in a year, green fodder is available						
Cultivated on Own Land	3.45 (4.43)	3.06 (4.19)	6.45 (4.3)	6.71 (4.4)	4.96 (4.61)	4.9 (4.6)
Purchased from market	0.81 (2.26)	0.97 (2.42)	0 (0)	0.08 (0.64)	0.40 (1.64)	0.52 (1.81)
Cultivated on Panchayat Land	0.8 (0.81)	0.03 (0.32)	0.178 (0.76)	0.44 (1.54)	0.13 (0.8)	0.24 (1.13)
Cultivated on Forest land	0.052 (0.66)	0 (0)	0.22 (0.76)	0.47 (1.5)	0.135 (0.71)	0.24 (1.1)

Figures in parenthesis are standard deviations of sample statistics

There is no statistical difference in the average availability of green fodder for RBP and comparison group. However, it is important to note that while year round availability of green fodder is necessary to maintain healthy cattle, the same is not available for more than six months. This scenario calls for considerable attention towards fodder development.

3.2.5 Farmers' experience with Local Resource Persons

This section presents the farmers' experience of working with LRPs. Initial briefing on the benefits of adopting Ration Balance is one of the first critical steps towards successful program implementation. The household survey revealed that over 98 per cent of participants received initial briefing by the concerned LRP. In Karnataka, all RBP households in the sample were briefed. These results indicate effectiveness in program implementation.

Table 3.10: Initial Briefing by LRPs (N=504)

	Kerala	Karnataka	Total
Did LRP initial brief you on benefits of RB			
Yes	243 (97%)!	253 (100%)!	496 (98%)!
Average number of times the LRP visited the HH in last 3 months			
	3.03 (0.508)*	3.42 (0.69)*	3.28 (1.51)*

! Figures in parenthesis are the proportional values of corresponding frequencies
*Figures in parenthesis are standard deviation of sample statistics

From table 3.10 it is evident that the frequency, with which LRP visited RBP households during last 3 months, is similar in both the states. However the difference is statistically significant in favor of Karnataka.

Providing the farmers with the RBP advice slip is considered helpful in assessing long term impacts of the program. Both the states reported to have received the RBP slip and over 74 per cent of them kept it properly.

Table 3.11: RBP Slip (N=504)

	Kerala	Karnataka	Total
RBP advice slip received from LRP	215 (85%)	238 (94%)	453 (90%)
Advice slip kept properly by farmer	161 (64%)	211 (83%)	372 (74%)

Figures in parenthesis are the proportional value of corresponding frequencies

Approximately 90% of RBP households reported that they received RBP advice slips from LRP. This number drops to 74% when it comes to preserving the slips properly. The program managers may have to inform and incentivize (not necessarily monetary) the participants on the importance of maintaining advise slips for future reference and adjustment in ration provision for milch cattle.

Table 3.12: Satisfaction from LRP Services (N=504)

	Kerala	Karnataka	Total
Average Satisfaction from LRP Services	4.69 (0.501)	4.79 (0.426)	4.74 (0.467)
Would you Recommend LRP services to others	4.69 (0.517)	4.67 (0.492)	4.69 (0.50)

Figures in parenthesis are standard deviations of sample statistics

The table above presents some variant of a report card on LRP performance. On a scale of 5 (5 being the highest satisfaction level), LRPs received impressive rating of 4.74 and similar results can be observed at state level as well.

The farmers were also asked as to how likely they are to recommend others to take services of the LRP. This information is crucial for gauging the financial sustainability of maintaining LRPs once the program is rolled back. The table above indicates the high likelihood of recommendation in both the states.

3.2.6 Mineral Mixture

Milk unions have been quite proactive in disseminating the information related to benefits of feeding mineral mixture. Over 55 per cent of RBP households received such information through Milk Union officers. LRPs also played key role spreading awareness of mineral mixture benefits. In fact 96 per cent of households in Kerala and 90 percent in Karnataka reported LRPs as their primary source of information on use of mineral mixtures.

Table 3.13: Source of Information on Mineral Mixture

	Kerala	Karnataka	Total
Milk Union officer	163 (65%)	116 (46%)	279 (55%)
DCS Staff	39 (16%)	21 (8%)	60 (12%)
LRP	242 (96%)	229 (90%)	471 (93%)
Local Vet Doctor	42 (17%)	5 (2%)	47 (9%)

(Figures in parenthesis are the proportions)

The survey data indicates that approximately 85% of RBP households did not use mineral mixture before they enrolled for the program.

Table 3.14 informs that the average cost of mineral mixture is INR 62/kg for RBP HHs as compared to INR 71/kg for non-RBP HHs. The difference is less pronounced in Karnataka but it is statistically significant.

Table 3.14: Average Cost, Regular Supply & Source of Mineral Mixture

	Kerala		Karnataka		Total	
	RBP HH	Non RBP HH	RBP HH	Non RBP HH	RBP HH	Non RBP HH
Average Cost of Mineral Mixture (Rs/kilo)	95 (55)**	122 (135)**	31 (10)**	33 (14)**	62 (50)**	71 (98.5)**
Regular supply of MM	210 (84%)*	135 (54%)*	244 (96%)*	217 (85%)*	461 (91%)*	345 (69%)*
Source of Mineral Mixture						
DCS	235 (94%)*	160 (65%)*	253 (100%)*	221 (87%)*	488 (97%)*	381 (76%)*
Market	37 (15%)*	38 (15%)*	1 (0%)*	0 (0%)*	37 (7%)*	39 (8%)*

(Figures in parenthesis are proportions)*
*(**Figures in parenthesis are standard deviation of sample statistics)*

Dairy cooperative societies have become the point of sale for mineral mixture. Member HHs do not face much constraint in purchasing mineral mixture as 91% of RBP HHs reported having access to regular supply of mineral mixture as compared to only 69% by non-RBP HHs.

Table 3.15: Feed Cost for RBP HHs (N=1007)

	Kerala		Karnataka		Total	
	RBP HH	Non RBP HH	RBP HH	Non RBP HH	RBP HH	Non RBP HH
Increased	183 (73%)	128 (52%)	136 (54%)	107 (42%)	319 (63%)	235 (47%)
Decreased	12 (5%)	2 (1%)	5 (2%)	2 (1%)	17 (3%)	4 (1%)
Remained same	56 (22%)	64 (25%)	112 (41%)	113 (44%)	168 (33%)	174 (35%)

(Figures in parenthesis are proportions)

Approximately 63% of RBP HHs reported increase in their feed-cost as compared to 47% of non-RBP HHs. The difference in cost is somewhat less pronounced in Karnataka as compared to Kerala. The increase in feed cost is attributed to increased use of mineral mixture as increasingly larger numbers of farmers have started using minerals and may experience cost surge in the initial phase. This is likely to phase out in later phase of the program.

Table 3.16: Before-After Feed Costs per Day for RBP HHs (N=504)

	Kerala	Karnataka	Total
Before RBP	191 (77.24)	115.44 (69.05)	153.3 (78.5)
After RBP	203.58 (83.36)	109.95 (53.13)	156.58 (84.05)

Figures in parenthesis are standard deviation of sample statistics

It is important to note the results in terms of monetary value of the feed cost. The picture is less uniform at the state level. While Kerala farmers on an average incurred INR 191/day as feed cost before the start of the program, the average costs increased to INR 203.58/day. This result is quite close to overall sample average. However data from Karnataka informs that average cost went down from INR 115.44/day to INR 109.95/day. A closer look at the sample revealed that Karnataka farmers on an average have completed more days with the program and are therefore likely to experience favorable change in the feed cost.

Table 3.17: Accessing RBP Services by paying a Fee

	Kerala	Karnataka	Total
Would you like to avail RBP services by paying a fee	60 (24%)**	193 (76%)**	253 (50%)**
How much would you pay on monthly basis	6.46 (22.28)*	38.56 (46.93)*	21.01 (39.009)*

(*Figures in parenthesis are standard deviation of sample statistics)
(**Figures in parenthesis are proportions)

3.2.7 Perceived Benefits

Majority of RBP HHs reported increase in their monthly income from dairy.

Table 3.18: Monthly Savings Per Animal from Dairy

	Kerala	Karnataka	Total
No change in savings	85 (34%)*	70 (28%)*	155 (31%)*
Decrease in savings	7 (3%)*	4 (2%)*	11 (2%)*
Increase in savings	159 (63%)*	179 (71%)*	338 (67%)*
Average monthly saving experienced	949.62 (708.74)**	484.21 (304.98)**	662.31 (547.48)**

(*Figures in parenthesis are proportions)
(**Figures in parenthesis are standard deviation of sample statistics)

The average increase in income varies across the two states. While Kerala participants reported to have gained by INR 31.65 per animal per day, Karnataka farmers earned INR 16.14 per animal per day more than before. The average increase in savings amounted to INR 22.07 per animal per day

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Table 3.19: Perceived Benefits from RBP (N=504)

	Kerala	Karnataka	Total
Improvement in health of animal after joining RBP			
Reduced	5 (2%)	20 (8%)	25 (5%)
No Change	15 (6%)	85 (34%)	100 (20%)
Improved	231 (92%)	148 (59%)	379 (75%)
Use of Savings from RBP			
Expansion of Dairy herd	130 (52%)	111 (44%)	241 (48%)
Child health	91 (36%)	64 (25%)	155 (31%)
Child Education	50 (20%)	35 (14%)	85 (17%)
Change in amount of feed waste after RBP			
Reduced	65 (26%)	24 (10%)	89 (18%)
No Change	153 (61%)	215 (85%)	368 (73%)
Increased	33 (13%)	14 (6%)	47 (9%)

(Figures in parenthesis are proportions)

After joining RBP, 75 per cent of RBP households observed improvement in the health of the animal. In Kerala the improvement was more pronounced (92 per cent). Approximately half of RBP households claimed to have used increased monetary savings attributable to RBP on their child's education. Expansion of dairy herd was another significant perceived benefit (48 per cent), which imply that farmers are investing back in their business.

Approximately 73 per cent of surveyed RBP households did not experience any change in the amount of feed waste post the adoption of RBP. Only 18% percent observed any reduction. This provides a major area for improvement as reduction of the feed waste is one of the objectives of program.

3.2.8 Extension Services

Important source of information for RBP have come out to be the Milk Unions and LRPs. DCS doesn't seem to have much of an impact in spreading the information. LRPs have been very effective in Karnataka with over 98 per cent households reporting it one their information source on RBP.

Table 3.20: Information Sources on RBP

	Kerala	Karnataka	Total
Milk Union	141 (56%)	79 (31%)	220 (44%)
DCS	37 (15%)	12 (5%)	49 (10%)
LRP	179 (71%)	248 (98%)	427 (85%)
Friends	5 (2%)	2 (1%)	7 (1%)

(Figures in parenthesis are proportions)

The table below provides information on the outreach of the program through various means, such as screening of films/documentary, distribution of pamphlets, village awareness programs (VAPs), and installation of banners and posters. The reach of documentary/ film was highly extensive in Kerala with 73 per cent reporting to have watched it. However in Karnataka, this reach has been extremely limited. Mere 8 per cent reported to have watched it.

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The visibility of poster and banners on RBP is quite satisfactory. At the state level, 67 per cent of RBP households in Kerala and 74 per cent in Karnataka reported to have noticed banners and posters on RBP. The outreach through pamphlet and brochure is also quite significant (65% coverage). The proportion RBP farmers who have watched a film/documentary on RBP is quite low in Karnataka (8%) as compared to 73% in Kerala. Program managers should attempt to intensify the efforts on this front.

Table 3.21: Attendance in Village Awareness Programs

Attendance in Village Awareness Programs	Kerala	Karnataka	Total
Never	17 (3%)	58 (11%)	75 (7%)
Once	106 (21%)	156 (31%)	262 (26%)
Twice	147 (29%)	81 (16%)	228 (22%)
Thrice or more	229 (46%)	213 (42%)	442 (44%)

(Figures in parenthesis are proportions)

The VAP is conducted by Milk Unions/ DCS. The table above indicates active participation in VAPs in both the states. In Kerala, almost half the numbers of RBP HHs have participated in such programs for three times of more.

3.3 Evaluating Project Impacts using PSM

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 RBP, the most challenging aspect of program evaluation is to estimate yield related outcomes for participants if they had not participated in RBP. 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 dairy farmer, given a vector of characteristics $\mathbf{x}$, can be expressed as:

$$\text{ATE} = E\,[y_1 \mid \mathbf{x}] - E\,[y_0 \mid \mathbf{x}]$$

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

$$\text{ATT} = E\,[y_1 \mid \mathbf{x},\, \text{RBP} = 1] - E\,[y_0 \mid \mathbf{x},\, \text{RBP} = 1]$$

We have already mentioned that $E\,[y_0 \mid \mathbf{x},\, \text{RBP} = 1]$ 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 $[y_0 \mid \mathbf{x}, \text{RBP} = 0]$, 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:

$$E[y_0 \mid \mathbf{x}, \text{RBP} = 1] - E[y_0 \mid \mathbf{x}, \text{RBP} = 0] = 0$$

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. RBP 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 3.1: Identification of Impact Evaluation Methodology in presence of Selection Bias
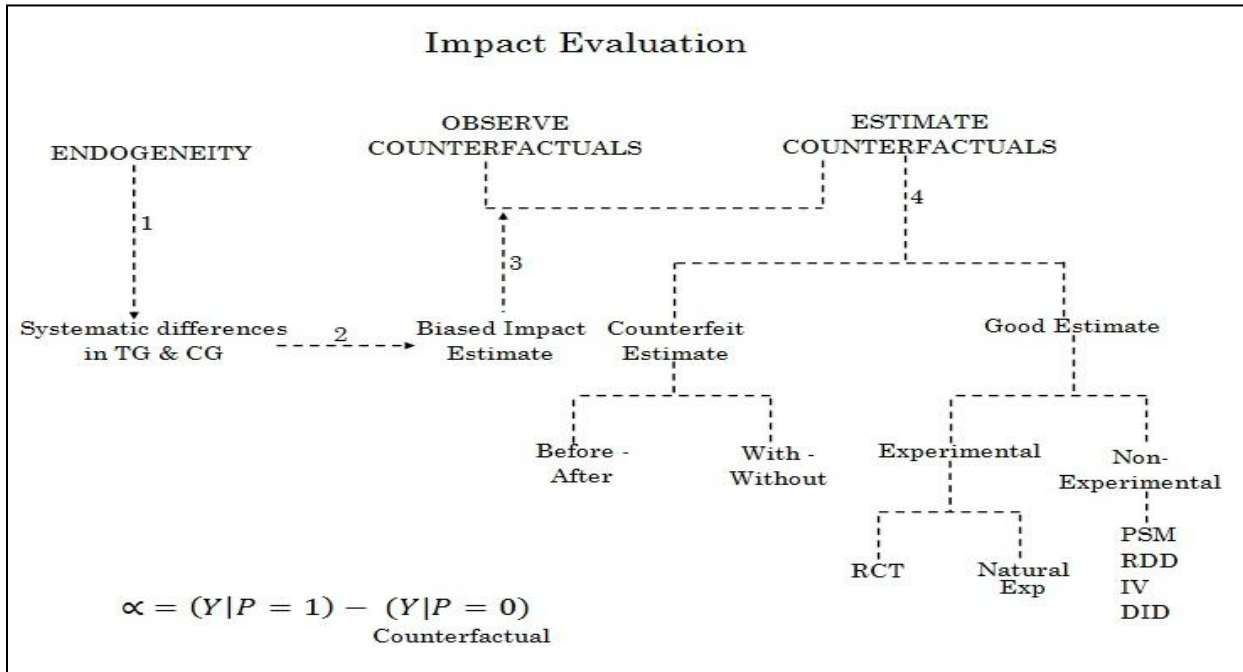
In the presence of selection/program placement bias (endogeneity), the control group households would be systematically different from treatment group. For instance, in the RBP study these differences were observed in relation to education, access to cultivated, caste, source of green fodder, exposure to program communication methods, etc. In addition to observed, there are several unobserved characteristics that may get correlated with program participation and empowerment related outcomes. As already noted, RBP was not rolled out using Randomized Control Trials; 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 3.2: Identification of Impact Evaluation Methodology in absence of random allocation
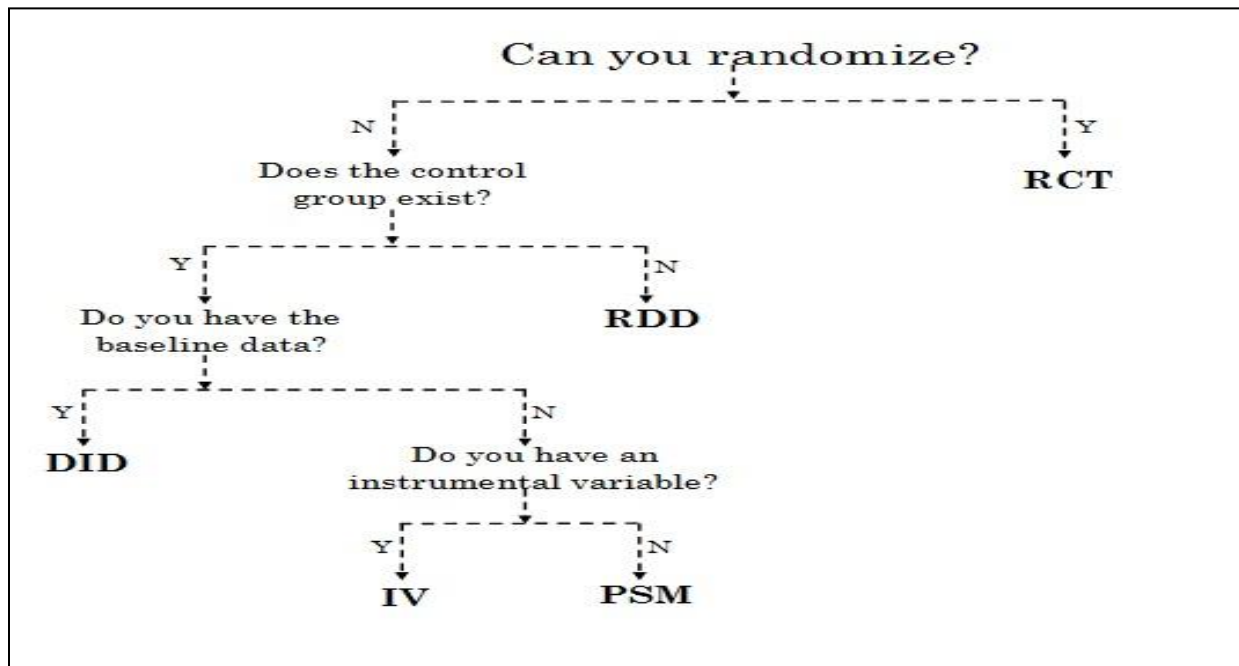
The above figure outlines some of the basic conditions for using one of the available quasi-experimental methodologies. We started by asking the question that whether the research team has access to baseline data. We were made available the report on baseline data that contained summary statistics on various household, community and cattle characteristics. The data did not explicitly summarize dairy related outcomes in terms of production, cost, and usage of mineral mixtures. 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, Regression Discontinuity Design (RDD), Instrumental Variable (IV) and Propensity Score Matching (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 PSM Method for estimating the counterfactual group that can be made appreciable free from selection bias problem.

3.3.1 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 RBP program. Our data set contains both types of households, that enrolled and that did not enroll in the program. The RBP 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, $E\,[y_0\,|\,\mathbf{x},\,RBP = 1]$

3.3.2 Program Participation/Selection Model and Propensity Scores

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

$$log \frac{p(RBP=1)}{1-p\ (RBP=1)} = \beta_0 + \beta_1 land_i + \beta_2 caste_i + \beta_3 education_i + \beta_4 internet_i + \beta_5 fodder_i +$$

$$\beta_6 film_i + \beta_7 banner_i + \beta_8 pamplet_i + \beta_9 vap_i + \beta_{10} cultivated_i + \beta_{11} bpl_i + u_i$$

Table 3.22: Variables in the Program Participation Model

Variable Name	Variable Description
Land	Total land holding (bigha)
Cultivated	Size of cultivated land (bigha)
Caste	OBC, SC, ST (base category=General)
Education	Education: primary, secondary, graduate (base category=Uneducated)
Internet	Access to internet (mobile/broadband) (1=Yes, 0=No)
Fodder	Availability fodder during a year (months)
Film	Has the farmer watched film/documentary on RBP (1=Yes, 0=No)
Banner	Has the farmer seen banner/poster on RBP (1=Yes, 0=No)
Pamphlet	Has the farmer received pamphlet on RBP (1=Yes, 0=No)
VAP	Has the farmer attended a village awareness program on RBP (1=Yes, 0=No)
BPL	BPL household (1=Yes, 0=No)

The above table presents a list of variables that were used to construct the participation model and also estimate the propensity scores. The participation model is useful in understanding the efficacy of program targeting.

Table 3.23: RBP Participation Model (Marginal Effects: dy/dx)

Selection Factors	Prob (RBP=1 | x)	Standard Error
Land	0.004	0.015
Cultivated	-0.33**	0.033
OBC	0.031	0.047
SC	-0.174	0.092
ST	-0.047	0.20
Primary	0.0442	0.064
Higher Secondary	0.008	0.067
Graduate	0.074	0.105
Internet	-0.497**	0.107
Fodder	-0.008	0.007
Film	0.300**	0.04*
Banner	0.132*	0.047
Pamphlet	0.571**	0.033
Vap	-0.152**	0.021
Bpl	-0.011	0.054

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

From the table above, it can be inferred that program attracted small, medium, and large landed farmers, alike. Similarly, the RBP has been able to target below and above poverty line households, equally well. The uneducated farmers were not left behind given that are equally likely to participate in the program as educated farmers. These results strengthen the notion that RBP program to start with, was largely free from program placement bias.

It is useful to note that access to internet is a significant factor in the decision to participate. Results indicate that comparable farmers with internet access are almost 50% less likely to participate in program. This result resonates with the observations of the research team during

the field visit. This phenomenon is expected to be more pronounced in the state of Kerala where large number of existing dairy farmers were working overseas and came back to their homeland a few years ago. They were well adept with technology use and could access RBP like web and mobile based applications. The provision to balance the ration for their cattle at their fingertips, might have dissuaded them from participating in RBP where the LRP visit is scheduled once a month. Since LRPs also use web based applications on their netbooks for providing advisory services to the participants, the non-participants with internet access may approach such services directly.

The end implementing agencies have used several methods to promote the RBP program. This includes, village awareness programs, distribution of pamphlets, displaying banners and posters on RBP, screening of documentary film, etc. The estimates from the program participation model indicate that documentary films, posters/banners, and pamphlets had a significant positive effect on program take up. The most successful method turns out to be distribution of pamphlets (dydx=57%). However the village awareness program requires further attention to make it an effective mode for program targeting.

3.4 Impact of RBP on Milk Production

Propensity scores estimated from the program participation model has been used to identify comparable dairy farmers from RBP and non-RBP households. One of most cited matching algorithms: 'kernel matching method' has been used to match households from treatment and comparison group. Results from impact evaluation model are presented below:

Table 3.24: Impact Estimates

Outcome Indicator	Sample	Treated	Control	Difference
Average Yield	Unmatched	10.47	10.64	-0.17
	ATT	10.53	10.48	0.05
	ATE			0.145
Peak Yield	Unmatched	13.50	13.05	0.45
	ATT	13.52	11.08	2.44*
	ATE			1.66
Insemination	Unmatched	1.65	2.03	-0.38***
	ATT	1.65	1.93	-0.28
	ATE			-0.32

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

Impact estimates based on the above table indicate that the program had positively influenced the intended outcome parameters. The effect on average milk yield is positive but marginal. Given the structure of the PSM methodology, above estimates cannot take into account the effect of lactation stage of the animal when at the start of RBP. Therefore a separate regression was implemented to account for variations due to lactation stage. The regression results show that animals who received RBP in early stages of their lactation produced 520 ml/day more as compared to animals in the midst of their lactation, while late stage animals produced 380 ml/day less than the middle category.

The results for peak yield are robust and valid from the statistical perspective. The RBP animals produced 13.52 liters/day as compared to 11.08 liters/day produced by non-RBP animals. The difference of 2.44 liters/day can be attributed to the RBP program as these estimates are based on the matching process. The program had a positive impact on the number of inseminations

required for conception. One out of every three RBP animal required one less insemination comparable unit. However the program effect is not significant[13].

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[13] Insignificant program effect may be due to the fact that the total sample size of 1007 HHs did not provide necessary statistical power required for rejecting the null hypothesis of zero program impact. Power calculations were not possible due to lack of information on minimum detectable effect (MDE) and standard deviation of outcome variables at the baseline.

4. Program Processes, Outcomes and Strategies

This chapter presents an evaluation of the processes and strategies adopted for the successful implementation of RBP in the southern states of Kerala and Karnataka. The chapter details out gaps in the implementation processes and strategies, if any, in order to achieve intended outcomes. The detail presented in this chapter is primarily based on qualitative data and observations collected from interviews of 30 LRPs, 20 DCS and RBP team. This data has been collected for both the EIAs. The primary data collected through household survey has been used to substantiate the results and arguments, wherever necessary. Relevant secondary data has also been collected from both the EIAs.

4.1 Program Coverage

Table 4.1 provides a snapshot of the program status in the two EIAs. Both EIAs have completed the first module (200 villages) and have started working on the second module (another 200 villages) of RBP. They have achieved their targets (in terms of number of villages to be covered / number of DCS in case of MRCMPU) provided in the first module. MRCMPU is yet to achieve the target given under second module. MRCMPU is currently in the process of training 60 LRPs in 3 batches. The Union is also in process of recruiting remaining LRPs.

It is important to note that unit of the target in both the EIAs is different. BAMUL shows its progress in terms of number of villages covered under the program and they appoint LRPs at the village level, whereas MRCMPU tracks its progress in terms of number of DCS covered under the program and hence appoints LRP at the DCS level. The reason for this difference is that, in Kerala, villages are scattered in vast geographical areas and it is difficult for one DCS or an LRP

to cover the entire village. Therefore, in many villages, there are more than one DCS. The appointment of LRP in MRCMPU is also done at the DCS level. A team of six personnel, including an RBP Coordinator, technical officers, trainers and an IT Officer, are taking care of the implementation of the program at the EIA level in both the EIAs.

Table 4.1: Program Status (As in Feb, 2016)

SN	Coverage	MRCMPU		BAMUL		Remark
		Target till March 2016	Achievement	Target till March 2016	Achievement	
1	Villages under RBP	200	210 DCS in 155 villages	400	412	MRCMPU appoints LRP at DCS level
2	LRP	200	159	400	413	
3	Animals	16000	19039	32000	28268	
4	Farmers	NA	13921	NA	25789	

Note: MRCMPU's data indicates progress for module 1; BAMUL data includes Module 1

4.2 Selection of RBP Villages

The selection of RBP villages is done based on the performance of DCS. BAMUL is selecting these villages for RBP where DCSs are collecting milk from more than 80 animals and the daily milk collection is not less than 500 liters. MRCMPU's criterion for selecting RBP program area is different. MRCMPU selects those villages for RBP where daily milk collection is not less than 1000 liters. Therefore the selection of RBP villages is done on the basis of the performance of the DCS.

4.3 Program Outcomes and Benefits

Table 4.2 below provides a snapshot of the achievements made by the EIAs under RBP so far. The table indicates that average milk production per animal per day has increased in both the EIAs. The net change in milk productivity is higher in BAMUL. BAMUL has performed better than MRCMPU in all indicators mentioned in the table below, except average milk fat. The average cost of feeding per kg milk has come down in both EIAs. Same is the case with average cost of feeding per animal per day. Both the costs are multiple times higher in BAMUL compared to what has been recorded by MRCMPU. Therefore, the program has been able to achieve its objectives in terms of increasing milk productivity and reducing the feed cost. However, it is important to note that increase in fat content is not directly related to increase in milk productivity. There are many instances where milk productivity has reduced, although fat content has increased. As a result, dairy income has also increased. It has been experienced in few cases that the milk productivity went down in the initial period when the farmers applied balanced ration. The milk productivity increased after sometime.

Table 4.2: Before and After RBP Scenarios of Milk Production and Feed Cost

Parameter	MRCMPU			BAMUL		
	Before RBP	After RBP	Net Change	Before RBP	After RBP	Net Change
Average milk production kg/Animal/day	8.43	8.72	+ 0.29	10.03	10.36	+ 0.33
Average milk fat (%)	3.86	3.97	+ 0.11	3.60	3.67	+ 0.07
Average cost of feeding (Rs/kg milk)	17.47	15.97	- 1.5	20.35	16.59	- 3.76
Average cost of feeding (Rs/animal/day)	147.23	134.54	- 12.69	204.18	166.47	- 37.71

Source: Data provided by EIAs (Feb, 2016)

Mineral mixtures are important ingredient of the balanced ration suggested by LRPs. The data shows that sale of mineral mixtures has gone up after the program started. Below table shows the mineral mixture sale before and after RBP. There is a slight decrease in the yearly sale of mineral mixture in 2015. This decrease is mainly because of three reasons: 1) the drop-out of some households that initially subscribed RBP, 2) some households who do not follow the program regularly, and 3) households reported that sometime they do not get mineral mixture from the DCS on time.

Table 4.3: Mineral mixture sale during Pre- and Post-RBP

| Item | Total sale in 2012 before RBP started | Yearly sale after RBP | | |
		2013	2014	2015
Mineral Mixture	41023	35000	72500	65000
Cattle Feed	4174	4420	4679	6500

Source: Provided by BAMUL

The program is also supposed to leave positive impact on animals' health through providing balanced ration. Therefore, visits made by veterinary doctors to household should also come down. RBP teams at the both the EIAs are of the opinion that the health of the animals that are given balanced ration has improved compared to earlier times. We have been able to confirm this claim when we interviewed LRPs and beneficiary households in the villages.

One of the early level outcomes of the program is whether or not households are following the balance rationed advice provided by LRPs. Figure 4.1 indicates that the program has been successful in making dairy farmers understand the benefits of this program and therefore they follow the advices given by the LRPs. A total of 84 per cent of RBP households follow

recommended ration advice regularly, while 11 percent households follow the recommended ration advice most of the times, but not regularly. This is a substantial number given that farmers had various doubts in their minds about the program, to begin with. Major reasons for not following the ration advice regularly, as per these households, are shortage of mineral mixture and frequent changes in the animal feed. The shortage of mineral mixture usually happens due to the delay made by the DCS in submitting intent to procure mineral mixture from EIA. The intents are submitted to EIA and EIA supplies the mineral mixture accordingly. The delay, sometime, is also caused by the EIA in supplying the mineral mixture due to unavailability of means of transportation.

Figure 4.1: RBP households following the recommended ration
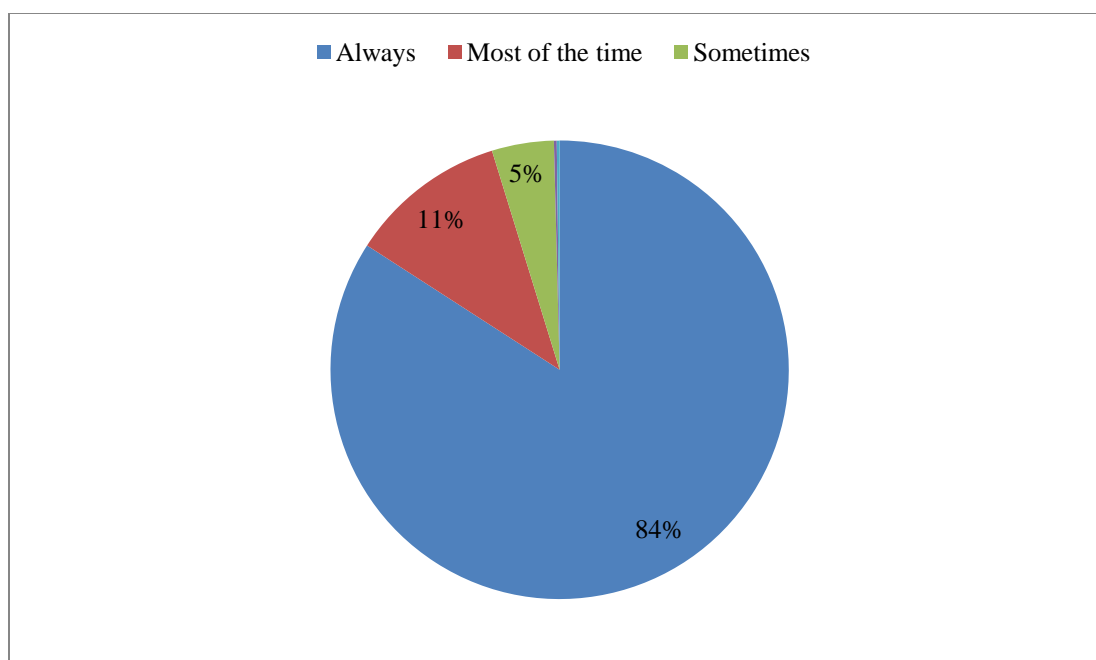
Source: Household Survey

Figure 4.2 summarizes the benefits that RBP households have experienced. The households have identified four major benefits: increase in milk fat (79%), better health of animal (72%), increase

in milk yield (68%) and increase in Solids Not Fat (SNF) (60%). However, only 15 percent household reported that the feed cost has decreased. The number seems less but it should be explained differently in the different contexts. In few cases we found that though the feed cost has not changed a lot, the milk yield and milk fat have increased post-RBP. Therefore, the farmers earn more after paying the same feed cost. The feed cost can also be impacted by different local factors such as availability of mineral mixtures, farmers' choice to stick with specific brands of mineral mixture, lack or unavailability of green fodder and other feeds, local rates of animal feeds, etc. This argument can also be substantiated further from the data showed in Figure 4.3. A total of 67 percent farmers have indicated that they have experienced increase in their monthly dairy income under RBP program.

Figure 4.2: Benefits experienced by RBP farmers
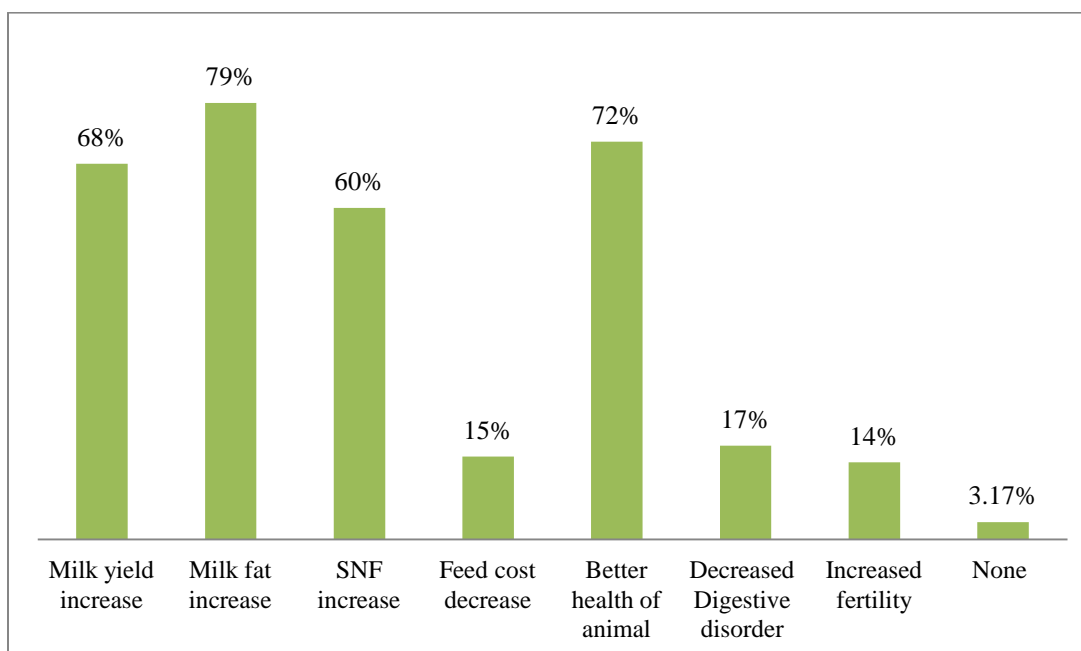
Source: Household Survey

Figure 4.3: Change in dairy monthly saving experienced under RBP
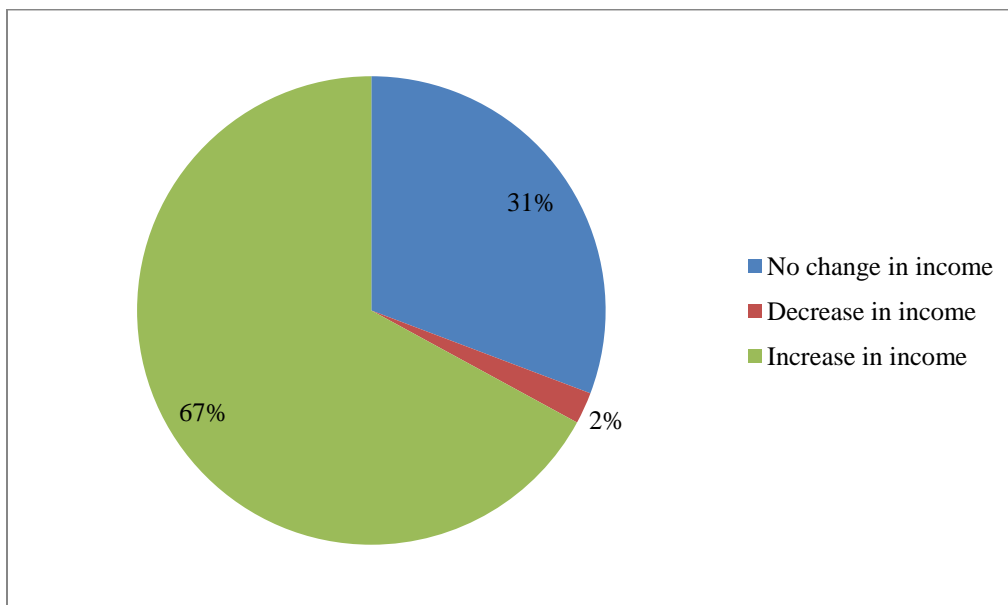
Source: Household Survey

The benefits of the households are not merely limited to the balanced advice provided by the LRP which results into increase in the milk fat, yield and income. Household also get benefitted from the wide experience of the LRP on the issues related to better management of animals. These benefits are related to various information animal management, deworming and supply of mineral mixture (Table 4.4).

Table 4.4: Additional services received by farmers from LRP

Services/Benefits	Frequency	Percentage
Supply of mineral mixture & feed supplements	149	30.00
Information on dairy animal management	281	56.00
Deworming service	174	35.00

Source: Household Survey

An LRP visits several animals and interacts with dairy farmers and have access to varied experiences of dairying practices. Therefore, an LRP becomes a medium of sharing these experiences across the village.

4.4 Capacity Building and Trainings

The training needs of RBP have been identified at two levels: functionaries at the EIA level and LRPs. The trainings of RBP functionaries at the EIA level are conducted by NDDB. A batch of 10 -15 participants from different EIAs are trained at once. The RBP teams at both the EIAs have received this training. LRP trainings are conducted by the EIA. LRPs are given two types of trainings: inception training and refresher training. The inception training is mandatory for all new LRPs. The duration of the inception training is 10 days. The training includes a five-day module of classroom based teaching and a five-day field training module. In the field training module, LRPs are given practical knowledge of ear tagging of animals, estimating balanced ration, milk yield and milk fat, and preparing balanced ration advice.

The inception trainings have been provided in both the EIAs. MRCMPU has translated training material into local language. The material which is provided to LRPs post-training is also translated and printed in local language. However, BAMUL is facing difficulties in this regard. The RBP team at BAMUL shared that they are facing problems in imparting training on INAPH. The directions and manuals of the software are written in English, which makes difficult for the LRPs to understand it. Because of this problem, BAMUL is trying to recruit those LRPs who have a reasonable hold on English language. This makes the LRP recruitment task tough for the EIA.

The EIAs are also supposed to review the effectiveness of the inception trainings provided to LRPs. These reviews should be done monthly. But our observations in both the EIAs indicate that this exercise is not being done properly and remains as an ad-hoc exercise. Technical officers and trainers informally seek LRPs' views about the training. The reviews of the effectiveness of inception trainings are very important to improve training contents as well as pedagogy.

Refresher training is an advance level training designed for existing (in-service) LRPs. The training focuses on new development brought in the program, implementation strategies and issues. LRPs, during the training, raise issues and problems that they face during their work and try to get solutions. BAMUL has organized three refresher trainings till now and has trained 45 LRPs. MRCMPU has organized a two-day refresher training where 11 LRP were trained. During the discussion with LRPs in both the EIAs it came out that the refresher trainings should be organized more frequently.

4.5 Program Monitoring Systems

Information Network for Animal Productivity and Health (INAPH), a window based internet linked software, works as a monitoring system for RBP. The software enables real time recording of data and information related to animal registration, animal nutrients requirement and supply. The software also enables LRPs to estimate local resources based balanced and least cost ration for animals. The software also provides a common information format to all EIAs where RBP is being implemented, though the EIAs have access to only its own data. The common information format makes monitoring system and related processes efficient for both

EIA as well as NDDB. Other than INAPH, monitoring of the program is also done by technical offers and trainers. As part of their visits to villages, these officers oversee the progress of RBP in the villages and also work as troubleshooter, in case LRPs are facing any problems.

LRPs find INAPH effective software in terms of recording relevant information which is readily available for use. The only, but widely prevalent, constraint is low internet connectivity. Both EIAs shared that because of unavailability or intermittent access of internet in distant rural areas, LRPs have to struggle to feed the information in the software on time. In many instances, LRPs maintain RBP data manually and they update it on the software whenever they visit nearby city or town and get internet connectivity.

EIAs also shared that there are problems with the compatibility of the softwares/operating system of the netbooks provided to LRPs. More often the netbook hangs and takes long to update the data. This happens even in the places where internet connection is intact. These netbooks were procured as per the specifications provided by NDDB. EIAs are of the opinion that the netbooks should be assembled with more advance and efficient softwares/operating system. EIAs officials also shared that LRPs use these netbooks for their personal use as well and store their personal files. This makes the functioning of the computer slow. The problem has simple technology based solutions, for instance, EIAs can choose to hard-lock netbooks to avoid undesirable usage. Secondly, LRPs are also not very much aware of the internet threats (virus) when they use the internet. This results into inviting viruses into the system, which make the operating system slow.

The efficacy of any monitoring system depends on the state of data keeping and maintenance, and use of that data in decision making. The evaluation team tried to understand as to how EAIs use the data collected through INAPH. The team didn't find any systematic or formal procedures to analyze the data and use the results in the decision making process. EIAs collect the information through INAPH and use it to report the progress. INAPH is majorly treated as a compliance to be adhered under the program.

4.6 Attrition Rate among LRPs

LRP not staying in the job for a longer period of time is a very serious issue that EIAs are facing. EIAs invest considerable amount of resources and time in the recruiting and building capacities of LRPs. LRPs also establish rapport with the household. And if an LRP leaves the job, it not only becomes a problem for the EIA to find an alternative but it also hampers the progress of the program as new LRP would take some time to regain confidence of dairy farmers and convince them to participate in the program. In MRCMPU, out of 220 LRPs that were recruited and trained initially in the module one, 100 LRPs left the job. Out of 120 remaining LRPs, 60 LRPS are also working as Village Resource Persons (VRPs) under other dairy programs in the same villages. In the module two, which has not even started properly, out of 74 LRPs recruited by MRCMPU recently, 15 LRPs have already left the job. In BAMUL, out of 427 LRPs recruited for both the modules, 50 LRPs left the job. In BAMUL, About 60 LRPs are also working under STEP program as well.

The major reason for LRPs leaving the job very early is less salary. LRPs leave once they get any better opportunity. Almost all LRPs that were interviewed by the evaluation team expressed

their dissatisfaction with the current salary and pointed it out as a main reason for leaving the job. This trend can be seen across the categories of gender, education and age of LRPs. EIAs are now inclined to recruit those people as LRPs who are already working with the DCS in some other capacity. For these people, LRP's salary comes as an additional income. In MRCMPU, VRPs are already being paid an average of Rs 6000 per month and they also get additional salary for working as an LRP. Therefore, VRPs stay for longer time in both the roles. Similarly, in BAMUL, LRPs who are also working under STEP program don't leave the job frequently. Therefore, those who are already working with DCS in some capacity can be given preference for the LRP job. This solves the less salary issue to a greater extent.

Another way to prevent the higher attrition rate is to recruit women LRPs. Women LRPs stay in the job for longer period than men LRPs. Women LRPs don't leave the job frequently as they usually do not leave the village for work. For them, LRP salary is a bonus income that they earn along with household responsibilities. Women LRPs are able to access the household easily than men counterparts as the cattle management is mainly done by the women members of the household. Experiences in both the EIAs indicate that woman LRPs can effectively communicate to women members of the beneficiary household.

4.7 Sustainability

The sustainability of the program depends on two things: whether dairy farmers are willing to pay for the balanced ration services, and whether EIAs are able to explore alternatives ways of paying LRPs without putting monitory burdens on the EIA and DCS. We did ask this question to the farmers who are part of the program. Almost half of the farmers (50.2%) are willing to pay

for the program services. However, almost equal number of farmers (49.8%) denies paying any charges for RBP. The farmers say that DCS is already deducting some amount from their milk in terms of operational cost to run the society, then why they should pay more. Farmers understand that LRP services are part of DCS/Union services; therefore they should not any additional cost. Given that NDP-I support LRP payments is phasing out, EIAs should work out sustainability plans to ensure the continuity of efforts and program benefits.

The second alternative is that EIAs have a sound sustainability plan to run the program without seeking any financial help from NDDB. Both the EIAs have worked out a sustainability plan. MRCMPU is trying to deliver program services through Self-Help Group (SHG) model. MRCMPU would provide Rs 20000 to the group as revolving fund. MRCMPU would also provide one-time support of Rs 10000 to the group to set up an office. The group members will identify an LRP among themselves. The group will also decide the salary and/or benefits to be given to LRP. MRCMPU has set up 10 such SHGs in last financial year (2015-16) on experimental basis. Each group has a membership base of about 15-16 women. In the existing groups, usually the secretary of the group works as an LRP. According to the RBP team at MRCMPU, these groups are doing fine. MRCMPU is planning to set up 30 more SHGs in the current year (2016-17) and would expand this initiative very soon. Group members have also access to credit as they can lend from the group for their livelihood activities and the member who will work as LRP would get some additional remuneration as well. This plan seems working well as we discussed earlier in this section that women LRPs work more effectively than men and the attrition rate is lower among women.

BAMUL, in order to sustain the program, has created a corpus fund by deducting 1 paisa per liter milk procured. Using this fund, EIA is paying Rs 1500 to LRPs who have completed two years in the project. BAMUL is also planning to reduce the subsidy being provided on sale of mineral mixtures from Rs 40 to Rs 30. The surplus of Rs 10 would be given to LRPs who would sell the mineral mixture. However, this plan is subject to approval from the Board of Governors of BAMUL. This, if it gets approved, would be an addition in the existing sustainability plan that BAMUL has worked out. RBP team at BAMUL was vary of the proposed sustainability plan and suggested a long term support from the Government/NDDB. In their opinion, farmers are not ready to pay for the services, and without this, it is very difficult for the EIA to sustain the program by itself. Almost similar views were echoed by MRCMPU.

It is important for EIAs to follow RBP guidelines, where they are expected to formulate strategies to make LRP based extension service program sustainable.

4.8 Way Forward

The future of the program depends on how EIAs articulate and implement the sustainability plan. The evaluation team had conversation with the LRPs who completed two years in both the EIAs and tried to get their views on sustainability of the program. The major and only concern that LRPs put forward was uncertainty as well as low amount of their salary and therefore their inability to work longer in the program. Though these LRPs were very confident about the positive impacts of the program, however, they said that it would take longer to convince farmers to pay for the services. They also shared that once a farmer participate in the program for a

period of two years, he/she learns how to prepare balanced ration, and therefore, he/she would like to continue without seeking help from the LRP.

Therefore, there could be a possibility that RBP program can be phased out from the village where it the program saturated the village and all farmers have been benefitted from the program for at least two years. But this solution carries a challenge as well, which is about the future of LRPs. If the program is phased out from the village, what would then LRP do? A possible solution is that if an LRP is already engaged in some other dairy programs with DCS, or is a member of SHG, phasing out would not impair his/her livelihood option. However, such plans are subject to experiment at the EIA level. In addition to that, EIAs should also explore convergence with other government programs and schemes such as National Rural Livelihood Mission (NRLM), Accredited Social Health Activist (ASHA), etc., for providing financial support to LRPs beyond the implementation period of RBP.

5. Conclusion and Recommendations

This study provides an account of performance of RBP in terms of improving milk yields, feed costs, incomes, artificial insemination, monitoring systems and implementation challenges. There is a statistically significant difference in average milk yield, peak milk yield, feed cost, and artificial insemination rates. The program s had a positive impact on animals' health through providing balanced ration. RBP teams at the both the EIAs are of the opinion that the health of the animals that are given balanced ration has improved compared to earlier times. The research team has been able to confirm this claim when we interviewed LRPs and beneficiary households in villages.

One of the early outcomes is related to whether households are following the balance rationed advice provided by LRPs. Survey data shows that 84 per cent of RBP households follow recommended ration advice regularly, while 11 percent households follow the recommended ration advice most of the times, but not regularly. The high per cent of regular followers is a major outcome of the RBP program given that the farmers had various doubts in their minds about the program, to begin with. Major reasons for not following the ration advice regularly, as informed by households includes: shortage of mineral mixture and frequent changes in the animal feed.

Summary statistics from the survey data informs that approximately 90% of the beneficiaries received the RBP advice slip, while 74% of them kept it properly for future reference. There is definitely a room for improvement such that program managers should devise ways and means of informing and convincing the beneficiaries household regarding the importance of preserving

advice slips. This would allow the farmers to track the performance of their cattle in response to ration balance and change it if deemed necessary. On another note, every development initiative tries to increase the ownership of program performance with the intended beneficiaries. Proper maintenance of advice slips provides that opportunity to program managers in this direction.

RBP households have experienced major program benefits in the form of increase in dairy income, milk fat, SNF, decline in feed cost, and better animal health. Household also get benefitted from wide experience of the LRP on the issues related to better management of animals. These benefits are related to various information animal management, deworming and supply of mineral mixture. Given that the LRP has to visit several animals, interact with dairy farmers, and help them with their problems and also to learn about their dairy practices; has enabled LRPs to become source of information exchange across a village.

RBP program dedicated significant resources on capacity building and training. The training needs of RBP have been identified at two levels: functionaries at the EIA level and LRPs. The trainings of RBP functionaries at the EIA level are conducted by NDDB. A batch of 10 -15 participants from different EIAs are trained at once. The RBP teams at both the EIAs have received this training. LRP trainings are conducted by the EIA. LRPs are given two types of trainings: inception training and refresher training. One of the EIAs, BAMUL indicated difficulty in training LRPs in the INAPH since the directions and manuals are available in English language. As a result the search cost for LRPs has increased in terms of essential qualification of the English language.

In relation to program outreach, RBP managers have used various means such as films & documentary, distribution of pamphlets, VAPs, and banners & posters. The visibility of poster and banners to RBP households is quite satisfactory. At the state level, 67 per cent of RBP households in Kerala and 74 per cent in Karnataka reported to have noticed banners and posters of RBP. The outreach through pamphlet and brochure is also quite significant (65% coverage). However the proportion RBP farmers who have watched a film/documentary on RBP is quite low in Karnataka (8%) as compared to 73% in Kerala. Program managers should attempt to intensify the efforts on this front. Another area of concern is that VAPs are positively contributing to program take-up in southern states. Given that these results were observed post-facto, we anticipate that the source of this issue can be either at design or delivery stage of the VAPs.

Recommendations

Based on the results and conclusion drawn from the impact evaluation of RBP program in the two southern states, the study team has put forward following recommendations that are anticipated to enhance the effectiveness of the program implementation and outcomes:

1. EIAs should direct their efforts on working with RBP households who do not regularly following the RBP advice. Better program take-up will result in better program outcomes.

2. Relevant portions (that is, essential for LRP training) of INAPH manual should be should be translated in local language. This would not only enhance the efficacy of training programs but would also ease out the necessary qualification for recruiting LRPs and hence increase the eligible pool of such resource persons.

3. EIAs should hard-lock the laptops given to LRPs to avoid undesirable usage.

4. Refresher training programs should be organized routinely and more frequently.

5. The review of the effectiveness of inception trainings must be done regularly.

6. Those personnel who are already working with DCS in some remunerative role can be considered for the LRP job.

7. Efforts must be undertaken to enhance the outcomes related to program targeting. This is specially essential in the case of VAPs and films & documentary driven outreach programs.

8. Program managers can help beneficiary households to take the ownership of the RBP program by sensitizing them towards the need to preserve the advice slips provided by their LRP. This can as influence sustainability of the program, albeit indirectly.

9. In order to achieve sustainability, EIAs should workout possible convergence with existing government schemes and programs. The functionaries working in the programs like NRLM, ASHA, Anganwadi, etc., can also be considered as LRPs under RBP.

6. Case Studies

Case No. 1

Farmer's Name: Jayamma

Village: Vanakahalli

Jayamma lives in Vanakahalli village of Anekal Taluka od district Bangalore Rural. She lives with her husband and two children. She is a member of Vanakahalli DCS. Jayamma belongs to a family that comes under OBC category. Her family has been given BPL status by the Government. Jayamma has four milch animals, out of which three animals are under RBP. Jayamma started taking balanced ration advice from the LRP from August 2014 onwards. Before adopting RBP, her milch animals used to produce low fat quality milk, which used to result into low income for her family. She attended a Farmers' Orientation Program and few follow up meetings organized by the DCS. She came to know about RBP in these meetings and she decided to take benefit of RBP.

After subscribing the program, Padma, the LRP of the village, started giving her written advices of balanced ration calculated by him for her animals. She followed these advices very seriously and regularly. LRP used to come every month and provided a new advice for balanced ration to be given to milch animals. Jayamma recalls that she could not remember even a single instance she missed following the advice. She also shared that Padma have been providing advices for her animals as per the schedule every month. Now, Jayamma knows what quantity of feed she should provide to her animals. She uses a bowl to measure the quality of the feed.

Jayaama also provide mineral mixture to her animals as suggested by the LRP. Currently, she is providing 100 gram mineral mixture to each animal per day. She uses a steel glass to measure mineral mixture. Along with mineral mixture, Jayaama also provides green fodder (Napier Bajra) and Ragi straw to her animals. She understands the fine balance of these feeds and also understand that if she fails to keep the ration in balanced quantity, it would do harm to her animals.

After few advices given by LRP, Jayamma saw the improvement in the fat quality of the milk. The average fat quality of the animals rose from 3.12 percent to 4.4 percent. This is a huge increase in the fat quality of the milk. The yield of the milk also increased by an average of one liter per animal. The increase in fat quality as well milk yield resulted into increase in the milk income of Jayamma. The milk income has increase an average about Rs 70 per day pre-RBP to Rs 100 per day post-RBP. She uses this money purchase cattle feed, mineral mixture as well as to pay children's school fee.

Earlier she had to pay penalty to DCS because of low quality fat milk produced by her animals. Now she does not pay any penalty as the fat quality has improved. According to Jayamma, health of her animals improved after she has adopted RBP. Jayamma wishes to buy two more milch animals in order to expand her milk business. She is also happy with the LRP's consistency and care for animals.   As LRP and Jayamma are also part of a SHG, both meet more often and discuss dairy related issues.

Case No. 2

Farmer's Name: Pramilanamma

Village: Sunavara

Pramilanamma is a 5th class educated housewife. She lives in Sunavara village, located in Anekal Taluka, district Bangalore Rural. The village also has a DCS. Pramilanamma is the member of DCS. She has a family of four members, including her husband and two children. Pramilanamma's family has been identified as a BPL family. Currently she has three animals. She adopted RBP when she had two milch animals. Later on, she bought one more milch animal.

Pramilanamma adopted RBP in November 2014. Latha, LRP of the village, approached her when the program started in the villages. Pramilanamma was keen to join the program to increase milk productivity. Her animal used to produce low quality fat milk. After consultation with Latha and other family members, she decided to use ration balancing services provided by the LRP. Pramilanamma is giving 200 gram mineral mixtures to her animals every day. She is also providing 50 gram bypass fat to each animal every day.

After following few advices prepared by LRP, Pramilanamma realized that feeding balanced ration to her animals is working well. The fat quality increased from 2.6 percent pre-RBP period to 3.3 percent post-RBP. The SNF also increased from 8.3 percent to 8.5 percent. The quantity of milk increased from 12 liters to 15 liters. The increase in fat quality as well as milk yield resulted in an average of additional income of Rs 75 per day.

After adopting the program, Pramilanamma realized that the health of the animals got better. The frequency of indigestion of food in her animals went down. She, now, doesn't have to see veterinary doctor more often. While using balanced ration services, she also came to know about AI facility provided by the Milk Union. She used AI services for one animal.

Pramilanamma is happy with LRP's dedication and hard work. LRP visits her house as per the schedule every month. She also discusses with LRP about other cattle management related issues such as health, insemination, care from diseases, etc. Pramilanamma gives milk income to her husband who spends on family related expenses. She also meets her personal expenses,

whenever required. She shared that her husband never prevents her in spending money for her personal needs. She is the lone care takers of all three animals. Her husband is usually busy in agriculture related woks. She is not planning to purchase new milch animals; however she is rearing two calves and will keep them with her for milk production in future.

Case No. 3

Farmer's Name: Annapoorna

Village: Sadanahalli

Annapoorna along with her husband Muniswamanna and her child lives in Sadanahalli village of Bangalore Rural district. She belongs to general category. However, her family has been granted BPL status. Annapoorna has two cows. She is providing balanced ration under RBP to both the cows. She was initially contacted by the LRP. LRP convinced her to adopt RBP for her cows. Following LRP's advice, Annapoorna joined the program in April, 2014.

Annapoorna, along with her husband, take care of cows. Although, Annapoorna mostly receives the balance ration advice given by LRP, both she and he husband implement the advice. The LRP has demonstrated them as to how to measure the feed and mineral mixture. She uses a pot to estimate the animal feed every day. The amount of feed and mineral mixture, which should be given to animal, was marked in the pot so that she can measure the feed amount accurately. After adopting the program and following balanced ration advice regularly, Annapoorna saw improvement in quantity and quality of the milk. Before her participating in the program, an average milk production from one cow was about 8 liters per day. Currently, the milk production of two cows per day is about 25 liters.

Annapoorna had earlier one cow. Sometime after joining the program, she bought the second cow as well. The fat content of the cow that was with Annapoorna before she joined the program was 3.5 percent. The fat increased 3.5 to 4.1 percent post-RBP. SNF also increased from 8.3 to 8.5. Since one cow was bought after Annapoorna started implementing the program, pre-RBP milk productivity for that cow was unavailable. The dairy income which was Rs 2000 per week rose upto Rs 4000 per week. This translates into more than Rs. 16000 income for the family per month. During pre-RBP time, average family income was merely Rs 4000 per month, including dairy income coming from one cow.

The income coming from dairying is spent on various family requirements including child education, purchasing mineral mixture and cattle feeds, etc. Annapoorna has also used AI services for one of the cows. Annapoorna shared that now there is no wastage of feed as she gives only required amount of feed to cows. Annapoorna is also thankful to LRP, who visits her home about three times in a month. She is now able to understand the written advice slip and acts according to the prescription mentioned in the slip.

Annapoorna likes to continue with the program. She also has plans to buy a couple of more milch animals and bring them under the program. She recommends this program to other women

who have still not accessed this program. She is even willing to pay a reasonable amount of fee in order to avail ration balancing services.

Case No. 4

Farmer's Name: Lakshmamma

Village: Nagadasanahalli

Lakshmamma lives in Nagadasanahalli village that comes under Bangalore North Taluka of Bangalore Rural district. Lakshmamma belongs to a Scheduled Caste family. She has seven members in her family. Her family is listed in the BPL list. Currently, she has six cows, out of which four cows are being provided balanced ration under RBP. Lakshmamma learned about RBP at an event organized by the village dairy society. Though she had heard about the program but she was never convinced about the efficacy of the program. Her doubts got solved during the event and she decided to talk to Mr. Ashok M., LRP of the village. LRP visited her house and gave first advice slip of the balanced ration to be given to her cows. She followed consecutive advices consistently provided by the LRP. She realized the benefits of the program in some in few months after she started giving balanced ration to her cows.

After adopting the program, total milk productivity of four cows increased from 15 liters in the pre-RBP period to 25 liters post-RBP. The fat content increased from 3.9 percent to 4.5 percent. SNF also increased from 8.5 percent to 8.65 percent. Consequently, the milk income increased from Rs. 6000 per week to Rs 9000 per week. She also shared that now cattle feed does not go waste. Implementing RBP has not left any adverse impact on her animal as well, which was one of her fears regarding the program earlier. In fact, according to Lakshmamma , her cows are in a better state of health. Lakshmamma receives advices herself from the LRP and implements the

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same. She understands the contents of the advice. Though she is not educated but she can read the numbers. LRP tells her the feed contents as well as numbers that show the quantity mentioned in the advice slip. She does not take help from her husband or any other male family members in preparing the ration cows.

Lakshmamma uses a vessel to measure the feeds. She also provides mineral mixture to her cows.

She uses Nandini brand of mineral mixture, which was suggested by the LRP. Confident from RBP, Lakshmamma has also used AI services for one of her cows. LRP had suggested her to take AI services for her cows. LRP visits her every month as per the schedule. Lakshmamma likes to continue the ration balancing services in future as well. Though now she understands how one should feed a milch animal. She would also like to implement this program to her other cows when they are under lactation period. She is so impressed by

the outcomes of this program that she is willing to pay Rs 20 per advice for all her animal. She is also willing to convince other women friends form the village to access the program benefits.

Case No. 5

Farmer's Name: Narayana

Village: Sonnappanahalli

Sonnappanahalli is among those villages where RBP was commenced early (Sept, 2013). There are about 90 households who are associated with RBP. K. R. Shashikumar, LRP of the village, is

expecting to expand the program further based on the performance of the program. Narayana has two milch animals. Narayana belongs to general category. However, his family is listed as a household living below poverty line. There are three members in the family.

Narayana was introduced with this program during a farmer orientation program organized at the DCS premises. He consulted with LRP regarding the benefits of the program. He also consulted her family members. He started giving feed suggested by LRP. Finally, he adopted the program in December, 2013. He also started giving balanced ration and mineral mixtures to his animals as suggested by LRP. After following the advices provided by the LRP for few months, he realized the benefits of the program. During initial months, the yield of the milk went down. However, milk fat increased from 3 percent to 4.2 percent. Similarly, SNF increased from 8 percent to 8.4 percent. After few months, the milk yield also increased from 10 liters per day to 16 liters per day.

The weekly dairy income of the family increased from Rs 1500 per week to Rs. 2100 per week. Additional income provided some financial relief to the family in order to meet household expenditures. LRP suggested her to use AI services. Narayana used AI services for one of his animal. He also realized that he was not facing any serious problems related to his animals' health. Narayana used to make sure, even before RBP, that there was no waste of cattle feeds.

After he adopted RBP, such care was not required as the ration was balanced, which left almost no scope for the wastage.

After consecutive advices provided by the LRP, Narayana understood the ratios of various feeds to form a balanced ration for his animals. Though, he still follows LRP's advice. However, overtime, Narayana's dependency on LRP decreased. LRP still visits his house 2-3 times in a month. They discuss various issues regarding dairying.

Narayan likes to continue the program, even though she claims that he can now prepare a balanced ration based on his past experience. He accepts that the program has been very beneficial for his family and animals. He wishes to expand the program to other animals as well, provided he purchases few new milch animals. He has already recommended this program to his neighbors (he mentions Mr. Nagraj, etc.). However, he does not want to pay any cost for the program in future as he has already achieved the skill to prepare balanced ration.

Case No. 6

Farmer's Name: Sheeba

Village: Balussery

Sheeba is resident of Balussery village of Kozhikode district. The village is associated with Thurithiyad DCS. She belongs to general category. She has a total of four members in her family. She has only one milch animal. Because of having one milch animal, she was not very active in participating in the events and meetings organized by the dairy society. Another reason for her inactiveness is that the office of dairy cooperative society is very far from her house. She was contacted by the LRP of that village. LRP introduced her with the program and expected

benefits of the programs. After consultation with the LRP, Sheeba joined the program in April, 2014.

Sheeba herself manages the animal. Sheeba receives balanced ration advice from the LRP and implements it herself. Before adopting the program, average milk yield was about 10 liters per day. After few months of implementing the program, milk yield increased to an average of 12 liters per day. The fat content increased from 3.2 percent to 4.0 percent post-RBP. SNF also increased from 8.3 percent to 8.6 percent. Because of the increase in yield, fat and SNF, per liter income also increased from about Rs 28 per liter to Rs 34 per liter. Weekly dairy income increased by about Rs. 500.

Sheeba shared that she did not witnessed any health related issues to her animal after she had adopted the program. She also shared that even before her accessing the program; health of the animal was fine. Sheeba, on advice given by the LRP, also accessed AI services for the animal. Sheeba said that she is able to understand the advices provided by LRP. She attends regular meetings/programs organized by the DCS in her village. She said that she is very satisfied with the LRP's advices. They worked for her animal.

She also shared that LRP requested her to keep the cattle shelter cleaned and in a better state. LRP informed her about the benefits of keeping the cattle shelter clean. Sheeba also wants to get

associated with the Heifer Development Program, so that she can get cattle feed in subsidized rates.

Sheeba wants to continue the program is she buy a new cow or delivery of the existing cow happens. She has also recommended this program to her friends and neighbors. On the issue of paying for the ration balancing services, she responded affirmatively. But she added that she should have access to subsidized cattle feed or mineral mixtures. Or, in her opinion, the current prices for the cattle feed should be maintained.

Case No. 7

Farmer's Name: Sarojini

Village: Nanminda

Sarojini lives in Nanminda village of Kozhikode district. She has a family of three members. She belongs to OBC category. She has a total of three animals, out of which two animals are under RBP. She was contacted by the LRP working in her village. LRP told her about the benefits that she can achieved through this program. Sarojini consulted with her husband and decided to join the program. Sarojini joined the program in April, 2014.

The major work regarding the cattle management is done by Sarojini. Sarojini interacts with the LRP and receives balanced ration advices. She also prepares ration herself. As part of the feed suggested by LRP, she uses pellet, Thavidu, Besan, Cotton Seed and Corn powder, and mixes it with the green fodder. She also mixes mineral mixtures in the feed in the ratio suggested by LRP. As a result, she realized increase in the fat content from 4.0 percent to 4.9 percent, which is a

very high fat content. SNF increased 8.2 percent to 8.8 percent. The milk yield increased from 20 liters per day to 22 liters per day.

The dairy income of Sarojini increased because of the increase in fat, SNF and milk yield. The average milk income increased by Rs. 980 per week. Sarojini uses this income to bear household expenses. She also uses the income to bear her own expenses. However, it happens rarely as household expenditures are more important to her. She also said that the health of her animals under RBP has improved. Earlier she used to call veterinary doctors at least twice thrice in a lactation period. But now calling veterinary has become rare. She also acknowledged that there is no wastage of cattle feed. Animals eat whatever is being given to them. She doesn't feed her animal extra as she knows as to how much is required a milch animal. She also accessed AI services for her animals.

The frequency of the LRP to her house is once in a month. LRP visits her house every month on given schedule and reviews the performance of the animals. Sarojini wants to continue with the program as it is beneficial for her. She also wants to extend this program to other animals whenever they would lactate. She said that she has recommended her friends about the program. On the issue of paying some cost to access ration balancing services in future, she wasn't very sure about it. Though, she said that if she continues getting benefits from the program, there shouldn't be any problem for her in paying for the program services.

Case No. 8

Farmer's Name: Mannukkuttan

Village: Chathamangalam

Mannukkuttan, age 55, lives in Chathamangalam village of Kozhikode district. This is one among those villages where RBP was implemented quite early. Mannukkuttan belongs to OBC category and has a family of three members. Mannukkuttan is fairly educated. He had completed BA degree. Mannukkuttan has four animals and all animals are under RBP. Mannukkuttan came to know about this program through a meeting convened at the DCS office and he was present during that meeting. The meeting highlighted RBP and its benefits. Mannukkuttan thought to try this program for his animals. He talked to concerned LRP and asked him to visit his house. Mannukkuttan joined the program in December, 2013.

Mannukkuttan takes care of his animals. He interacts with the LRP, receives balanced ration advices from the LRP and implements them. LRP suggested him to use mineral mixtures, corn powder, green grass and straw for his animal. He uses a vessel to measure the feed. LRP has told him how much vessel he should fill for each feed item. Mannukkuttan uses a glass to measure mineral mixtures.

After using the program services and instructions issued by the LRP, Mannukkuttan saw appositive change in his animals' productivity. The fat content increased 3.8 percent to 4.7 percent. The SNF increased from 8 percent to 8.4 percent. The milk productivity decreased during initial months of using balanced ration, but it increased later from 36 liters to 40 liters per day for all animals. The dairy income per week rose from Rs 600 to Rs 1120. He also observed that animals kept good health after he applied balanced ration to animals. Mannukkuttan is happy

with the progress in his dairying. He is confident that now he can expand his agriculture work using his dairy income. Mannukkuttan has also used AI services for his animals.

Mannukkuttan is satisfied with LRP's inputs and advices prepared by him. LRP visits him house once in a month as per the schedule. It has never happened that LRP missed the schedule and didn't come to his home to provide new ration advice. Mannukkuttan is now understands the advices. He is so confident that he says that he can prepare advices for other animals without taking help from the LRP. However, he acknowledges that other than providing balance ration prescriptions, he has not received any other help from the LRP. Though, amny times they do discuss the animals related issues.

Mannukkuttan is willing to continue with the program as he acknowledges that it is a very good program. He has experienced positive impacts of the program on his animals. He is also willing to expand the program to new animals if he buys. Currently he is implementing the program on his all animals. He has recommended this program to people in the village whom he knows better. However he puts some conditions if he has to pay for these services. He says that subsidized cattle feed must be made available in order to pay for the program services. He also demands insurance to milch animals.

Case No. 9

Farmer's Name: Komalavally

Village: Kakkur

Komalavally lives in Kakkur village of Kozhikode district. Kakkur village is part of Ramanellor DCS. Komalavally has a family of four members: her husband and two children. Komalavally

belongs to OBC category. Komalavally has only one milch animal and she is availing ration balancing services to the animal. Komalavally came to know about the program through meetings organized by the dairy society in her village. Komalavally joined the program in 2013. Komalavally herself manages the cattle. She cleans cattle shelter, prepare the feed and milch it. She also interacts with the LRP, receives the advice provided by the LRP and implements the same herself. After joining the program, in a few months time, she realized the benefits of the program. The fat content increased from 3.1 percent to 3.6 percent. SNF increased from 8 percent to 8.3 percent. The milk productivity also increased from 10 liters per day to 13 liters per day. Due these improvements, milk income increased from Rs 300 to Rs 390 per week. Increased milk income provided him some financial freedom to manage the animal more effectively. Now she can purchase mineral mixtures and other green feeds without worrying about the finances.

Komalavally mentions that she is happy with LRP's contribution in the improvement of her income and cow's productivity. She shares that LRP makes her understand the advice properly. LRP prepared the ration during first few months of the program himself and taught Komalavally as to how she can prepare it herself. LRP visits her house once in a month as per the schedule. LRP comes when he is to provide new advice and review the animal's performance in the last month.

Komalavally is willing to continue the program. Though she has only one milch animal, which is already under the program, but she is also planning to buy a couple of new animal and expand her dairying business. If she buys, she will apply the ration balancing services to new animals as well. She always discusses the benefits of this program with her friends and relatives and recommends them to join the program. She denies paying any fee for the program in future. She

mentions that the ingredient that she has to use in order to prepare balanced ration are expensive and she has to purchase them regularly. Therefore, it won't be possible for her to pay extra fee to avail the program services. She has anyway learned how to prepare a balanced diet for a milch animal and now she can do it by herself.

Case No. 10

Farmer's Name: Gopalan

Village: Kakkur

Gopalan lives in Kakkur village of Kozhikode district. There are three members, including him, in his family. He belongs to OBC category and his family's has identified as an Above Poverty Line family. Gopalan has two milch animals and both animals are under the program. Gopalan started receiving the program services recently as he joined the program in 2015. He came to know about RBP during a meeting organized by the DCS. LRP was also present during that meeting. Few officials from MRCMPU attended the meeting and they briefed people about this program as well the benefits that one can achieved through this program. After the meeting he consulted with the LRP about joining the program.

After following the advices provided by the LRP, Gopalan received positive impact on the productivity of the animals as well as quality of milk improved. The milk yield of his two animals increased from 10 liters to 12 liters. Fat content increased from 3.8 percent to 5 percent. However, there was no significant changed observed in SNF. Due to increase in milk fat as well yield, the milk income also increased from about RS 10000 to Rs. 12240 per month.

He has not witnessed any adverse effect of the program on his animals. According him his animals' health was already in a good condition. He is also satisfied with the performance and dedication of the LRP. LRP never missed the schedule that he was supposed to meet to visit his house and animals. LRP usually visit his house once in a month. However, occasionally, he meets LRP when he is attending other houses or on the ways. He has also received advices and other support from the LRP such as information about deworming services, good veterinary doctors, etc.

Gopalan is very much interested in continuing the program for his animals. He is planning to buy one more cow and he would like to avail RBP services for new bought cow as well. He always discusses with his friends and relatives about the program and its positive results. He has asked his relatives who are staying in other village to adopt the program. However, Gopalan is not very sure about paying the fee to avail RBP services. He cites instances of expenses incurred on arranging cattle feed and mineral mixtures. For him, any additional cost to these expenses may be difficult for him to bear.

Annexure

Annexure 1: List of selected villages

Taluka	Village Name	DCS
State: Karnataka District: Bangalore Rural		
Anekal	B.Hosahalli	B. Hosahalli Milk Union Co-operative Society
Anekal	Bidaraguppe	Bidaraguppe Milk Dairy
Anekal	Huskur	Huskur Milk Union Co-operative Society
Anekal	Ichangur	Icchangur Milk Union Co-operative Society
Anekal	Ittangur	Ittangur Milk Dairy
Anekal	Sunavara	Sunavara Milk Dairy
Anekal	Vanakanahalli	Vanakanahilli Milk Dairy
Anekal	Yadavanahalli	Yadavanahilli Milk Dairy
Bangalore North	Byatha	Byatha Milk Dairy
Bangalore North	Challahalli	Challahalli Milk Union
Bangalore North	Gopalapura	Gopalapura Milk Union Co-operative Society
Bangalore North	Kukkanahalli	Chikkakukkana Halli Milk Diary
Bangalore North	Maralukunte	Maralukunte Milk Union Co-operative Society
Bangalore North	Mylanahalli	Bangalore North Milk Union, Mylanahalli Milk Union
Bangalore North	Nagadasanahalli	Nagadasanahalli Milk Union
Bangalore North	Sadenahalli	Sadenahalli Milk Society
Bangalore North	Seethakempanahalli	Seethakempanahalli Milk Society
Bangalore North	Sonapanahalli	Sonapanahalli Milk Dairy
Bangalore North	Yedeyuru	Yedeyuru Milk Society
Neelamangala	Shamabhattara Palya	Shayamabattarapalya Milk Union

Taluka	Village Name	DCS
State: Kerala	District: Calicut	
Kozhikode	Chathamangalam	Chathamangalam Shee Rolapathaka Sahakarana Sangam
Kozhikode	Chelannur	Mogakkallor Ksheerol Padaka Sahakarana Sangam
Kozhikode	Kakkad	Kallupuram Sheerol Padaka Sahakarana Sangam
Kozhikode	Kakkur	Ramallour Ksheerol Padaka Sahakarana Samaham
Kozhikode	Kodencheri	Mykevu Skheerol Padaka Sahakarana Sangam
Kozhikode	Koodathayi	Mykadu Ksheerol Padaka Sahakarana Sahakarna Sangam
Kozhikode	Nanmanda	Cheekkalod Ksheerol Padaka Sahakarana Sangham
Kozhikode	Peruvayal	Peruvayal Ksheerakarash Kolapathana Sagarana Sangam
Kozhikode	Thazhecode	Mukkam Ksheerol Padaka Sahakarana Sangam
Quilandy	Avitanallur	Thrikkuttissery K.S.S D94D
Quilandy	Balussery	Eramamgalam Ksheerol Padaka Sahakarana Sangam
Quilandy	Meppayyur	Keezhpayo Ksheerol Padaka Sahakarana Sangam
Quilandy	Ulliyeri	Ulliyeeri Sherakarghy A Sangam
Vadakara	Ayanchery	Kadamery Ksheera Karshakol Pathana Sagarama Sanga
Vadakara	Kottappally	Kottappaly Ksheerol Padaka Sahakarana Sangham D92
Vadakara	Palayad	Karuvancherry Ksheerol Padaka Sahakarana Samghamdi
Vadakara	Puramery	Kallupuram Ksheerol Padaka Sahakarana Sangam
Vadakara	Sivapuram	Iyyad Ksheerol Padaka Sahakarana Sangam
Vadakara	Villyapally	Thirumana Ksheerol Karshakol Pathana Sagarana Sanga

Annexure 2: Household Questionnaire (RBP group)

SCREENER QUESTIONNAIRE

CENTRE [7]	Bangalore Rural 01	Calicut 02				
GENDER [8]	Male 1	Female 2	**AGE [9]**	18-34 01	35-54 02	55+ 03

RESPONDENT'S NAME [10-59]	:	
ADDRESS [60-259]	:	
		PIN : [260-269]
TELEPHONE NO. [270-319]	:	
LOCATION / LANDMARK [320-369]	:	
EMAIL ID [370-419]	:	

FIELD CONTROL INFORMATION

Interviewer's name: _____Sign. _____Date _____ Time _____

Supervisor's name: _____Sign. _____Date _____ Time _____

Accompanied		**Scrutinised**		**Back Check**		**Center Code**	
TL	1	TL	1	TL	1		
EIC	2	EIC	2	EIC	2		
OFE	3	OFE	3	OFE	3		
FM	4	FM	4	FM	4		
PMT	5	PMT	5	PMT	5		
PM	6	PM	6	PM	6		

Signature   **Signature**   **Signature**

ANALYSIS OBSERVATIONS [420]	Extent of Problem:	No / Minor 1	Mild 2	Severe 3

Sr. No	Particulars ವಿಶಿಷ್ಟತೆ	Response ಪ್ರತಿಕ್ರಿಯೆ
Sec 1	Qualifying Question for RBP HHs [421-470] ಆರ್ ಬಿ ಪಿ ಹೆಚ್ ಹೆಚ್ ಗಾಗಿ ಅರ್ಹತೆಯ ಪ್ರಶ್ನೆಗಳು	
1	Is there a milch cattle in the household [471] ಮನೆಯಲ್ಲಿ ಹಿಂಡುವ ಜಾನುವಾರು ಇದೆಯಾ?	(1) Yes ಹೌದು (2) (2)Noಇಲ್ಲ
2	Has that milch animal(s) received RBP at least twice in last 9 months? [472] Continue only if `Yes', else terminate if `No' ಕಳೆದ ೯ ತಿಂಗಳಲ್ಲಿ ಕನಿಷ್ಠ ಎರಡು ಬಾರಿ ಹಾಲು ಕೊಡುವ ಪ್ರಾಣಿ(ಗಳನ್ನು) ಸ್ವೀಕರಿಸಿರುವಿರಾ?	(1) Yes ಹೌದು (2) (2)No ಇಲ್ಲ
Sec 2	HH Characteristics [473-522] ಹೆಚ್ ಹೆಚ್ ಗುಣಲಕ್ಷಣ	
3	Milk Union [523-572] ಹಾಲಿನ ಯೂನಿಯನ್	
4	District [573-622] ಜಿಲ್ಲೆ	
5	Taluka[623-672] ತಾಲ್ಕೋಖು	
6	Village Name [673-722] ಹಳ್ಳಿಯ ಹೆಸರು	
7	DCS Name [723-772] ಡಿಸಿಎಸ್ ಹೆಸರು	
8	Mobile No. [773-802] ಮೊಬೈಲ್ ಸಂಖ್ಯೆ	
9	Age [803-804] ವಯಸ್ಸು	
10	Gender [805] ಲಿಂಗ	(1) Male ಪುರುಷ (2)Female ಮಹಿಳೆ

11	Social category [806-807] ಸಾಮಾಜಿಕ ವರ್ಗ	(1) General ಸಾಮಾನ್ಯ
		(2) OBC ಓಬಿಸಿ
		(3) SC ಎಸ್ ಸಿ
		(4) ST ಎಸ್ ಟಿ
		(6) Others ಇತರೆ
12	Education : [808] ಶಿಕ್ಷಣ	(1) Uneducated ಶಿಕ್ಷಣವಿಲ್ಲ
		(2) Primary ಪ್ರಾಥಮಿಕ
		(3) Higher secondary ಹೈಯರ್ ಸೆಕೆಂಡರ್
		(4) Graduation & above ಗ್ರಾಜುಯೇಷನ್ ಮತ್ತು ಮೇಲ್ಪಟ್ಟು
13	Income category : [809] ಆದಾಯ ವರ್ಗ	(1) BPL ಬಿಪಿಎಲ್
		(2) APL ಎ ಪಿ ಎಲ್
14.1	Total Annual Income [810-817] ಒಟ್ಟು ವಾರ್ಷಿಕ ಆದಾಯ	
14.2	Monthly HH expenditure[818-825] ತಿಂಗಳ ಹೆಚ್ ಹೆಚ್ ವೆಚ್ಚ	
15	Do you have access to internet? [826] ಇಂಟರ್ ನೆಟ್ ಸಂಪರ್ಕ ಹೊಂದಿರುವಿರಾ?	(1) Yes (1)ಹೌದು
		(2) No ಇಲ್ಲ (2)
16	Any family member working overseas? [827] ಓವರ್ ಸೀಸ್ ನಲ್ಲಿ ಯಾವುದಾದರೂ ಕುಟುಂಬದ ಸದಸ್ಯರುಕೆಲಸ ಮಾಡುತ್ತಿದ್ದಾರಾ?	(1) Yes (1) ಹೌದು No ಇಲ್ಲ (2)
17	Any family member working in an Indian city? [828] ಭಾರತದ ನಗರದಲ್ಲಿ ಯಾವುದಾದರೂ ಕುಟುಂಬದ ಸದಸ್ಯರು ಕೆಲಸ	(1) Yes (1)ಹೌದು No ಇಲ್ಲ (2)

	ಮಾಡುತ್ತಿದ್ದಾರಾ?	
18	Total land holding (unit) : [829-836] **If no land skip 19 and go 20** ಹೊಂದಿರುವ ಒಟ್ಟು ಭೂಮಿ(ಯೂನಿಟ್)	
19	Type of land owned [837-856] ಹೊಂದಿರುವ ಒಟ್ಟು ಭೂಮಿ	(1) Cultivated ಕೃಷಿ (2) Fallow Land ಫಾಲೋ ಭೂಮಿ (2) Wasteland ತ್ಯಾಜ್ಯ ಭೂಮಿ (3) Forestland ಅರಣ್ಯ ಭೂಮಿ (4) Others (Specify)ಇತರೆ(ನಮೂದಿಸಿ) ………………………………………………………………………..
20	Source of green fodder [857-876] **Record Multiple Answer** ಹಸಿರು ಮೇವಿನ ಮೂಲ	(1) Cultivated on Own ಸ್ವಂತ ಭೂಮಿಯಲ್ಲಿ ಕೃಷಿ (2) Purchased from Market ಮಾರುಕಟ್ಟೆಯಿಂದ ಖರೀದಿಸಿರುವುದು (3) Cultivated on Panchayat Land ಪಂಚಾಯತ್ ಭೂಮಿಯಿಂದ ಕೃಷಿ (4) Cultivated on Forestland ಅರಣ್ಯ ಭೂಮಿಯಿಂದ ಕೃಷಿ (5) Cultivated on Lease land ಕೃಷಿಗಾಗಿ ಗುತ್ತಿಗೆ ಭೂಮಿ (6) Purchased directly from owner and cutting himself ನೇರವಾಗಿ ಮಾಲೀಕರಿಂದ ಖರೀದಿಸಿರುವುದು ಮತ್ತು ಸ್ವತಃ ಕಟ್ಟಿಂಗ್ ಮಾಡುವುದು (7) Others (Specify)………………………………………………… ಇತರೆ(ನಮೂದಿಸಿ)…………………………………………………
21	For how many months in a year, green fodder is available from the above source/s? Put in Numbers ಮೇಲೆ ನಮೂದಿಸಿದ ಮೂಲದಿಂದ ವರ್ಷದಲ್ಲಿ ತಿಂಗಳಲ್ಲಿ ಎಷ್ಟುಬಾರಿ ಹಸಿರು ಮೇವು ಲಭ್ಯವಿದೆ?	(1) Cultivated on Own Land ಸ್ವಂತ ಭೂಮಿಯಿಂದ ಕೃಷಿ………………….[1776-1777] (2) Purchased from Market ಮಾರುಕಟ್ಟೆಯಿಂದ ಖರೀದಿಸಿರುವುದು………………….[1778-1779] (3) Cultivated on Panchayat Land ಪಂಚಾಯತ್ ಭೂಮಿಯಂತ ಕೃಷಿ………………….[1780-1781] (4) Cultivated on Forestland

		ಅರಣ್ಯ ಭೂಮಿಯಿಂದ ಕೃಷಿ...............................[1782-1783] (5) Others (Specify) [1786-1800] ಇತರೆ(ನಮೂದಿಸಿ)...[1784-1785]	

22	Animal feeding is mostly handled by [879-898] ಪ್ರಾಣಿಗಳ ಫೀಡಿಂಗ್ಸ್ ಹೆಚ್ಚಾಗಿ ನೀವು ನಿರ್ವಹಿಸುವಿರಾ?	(1) Adult male member of family
		   ಕುಟುಂಬದಲ್ಲಿರುವ ವಯಸ್ಕ ಪುರುಷ ಸದಸ್ಯರು
		(2) Adult female member of family
		   ಕುಟುಂಬದಲ್ಲಿರುವ ವಯಸ್ಕ ಮಹಿಳಾ ಸದಸ್ಯರು
		(3) Childrenಮಕ್ಕಳು
		(4) Hired worker ಬಾಡಿಗೆ ಕೆಲಸಗಾರರು
		(5) Others, Specifyಇತರೆ ನಮೂದಿಸಿ	

23	Who decides the use of dairy income? [899] ಡೈರಿ ಆದಾಯದ ಬಳಕೆಯನ್ನು ಯಾರು ನಿರ್ಧರಿಸುತ್ತಾರೆ	(1) Adult male member of family ಕುಟುಂಬದ ವಯಸ್ಕ ಪುರುಷ ಸದಸ್ಯರು (2) Adult female member of family ಕುಟುಂಬದ ವಯಸ್ಕ ಮಹಿಳಾ ಸದಸ್ಯರು (3) Both ಎರಡೂ	
24	No. of Milch animals owned ಹಿಂಡುವ ಪ್ರಾಣಿಗಳನ್ನ ಹೊಂದಿರುವ ಸಂಖ್ಯೆ	Cow:............................. [900-902] ಹಸು Buffalo:............................. [903-905] ಎಮ್ಮೆ...................................	
25	No. of Milch animals under RBP ಆರ್ ಬಿ ಪಿ ಕೆಳಗೆ ಇರುವ ಹಿಂಡುವ ಪ್ರಾಣಿಗಳ ಸಂಖ್ಯೆ	Cow:............................. [906-908] ಹಸು Buffalo:............................. [909-911] ಎಮ್ಮೆ	
26	Enrolment date of animals in RBP [912-915] ಆರ್ ಬಿ ಪಿ ಯಲ್ಲಿ ಪ್ರಾಣಿಗಳ ನೊಂದಣೆ ದಿನಾಂಕ	Year - ವರ್ಷ Month – ತಿಂಗಳು ………………………………………………………	
Section ವಿಭಾಗ	**Extension material (27 to 31) [916-965]** ವಿಸ್ತಾರಗೊಂಡ ಮೆಟೀರಿಯಲ್		
27	Source of information on RBP [966-985]ಆರ್ ಬಿ ಪಿ ಯ ಮಾಹಿತಿಯ ಮೂಲ	(1) Milk Union ಹಾಲಿನ ಯೂನಿಯನ್ (2) DCS ಡಿಸಿಎಸ್ (3) LRP ಎಲ್ ಆರ್ ಪಿ (4) Friends/Relativesಸ್ನೇಹಿತರು/ಸಂಬಂಧಿಕರು	

		(5) Others, specify……………………………………… ইতরে নমূদিসি ইতরে নমূদিসি
28	Have you seen documentary/ Film on RBP [986] ಆರ್ ಬಿ ಪಿಯಲ್ಲಿ ಡಾಕ್ಯುಮೆಂಟರಿ /ಫೀಲ್ಮ್ ನೋಡಿರುವಿರಾ?	(1) No ಇಲ್ಲ (2) Yes, specify where-[987-1001] ಹೌದು ಎಂದರೆ ಎಲ್ಲಿ ಎಂದು ನಮೂದಿಸಿ……………………………………………………………
29	Have you seen any poster/banner on RBP [1002] ಆರ್ ಬಿ ಪಿಯ ಯಾವುದಾದರೂ ಪೋಸ್ಟರ್ ಗಳು/ಬ್ಯಾನರ್ ಗಳನ್ನು ನೋಡಿರುವಿರಾ?	(1) No ಇಲ್ಲ (2) Yes, specify where- [1003-1017] ಹೌದು ಎಲ್ಲಿ ಎಂದು ನಮೂದಿಸಿ……………………………………………………………
30	Have you received any pamphlet/ brochure on RBP [1018] ಆರ್ ಬಿ ಪಿಯಲ್ಲಿ ಯಾವುದಾದರೂ ಕರಪತ್ರ /ಬ್ರೌಚರ್ ಸ್ವೀಕರಿಸಿರುವಿರಾ?	(1) No ಇಲ್ಲ (2) Yes ಹೌದು
31	Have you attended village awareness programme conducted by your milk union/DCS? (if yes, how many times?) [1019] ಹಾಲಿನ ಯೂನಿಯ ನಡೆಸಿದ ಹಳ್ಳಿಯ ತಿಳುವಳಿಕೆ ಕಾರ್ಯಕ್ರಮವನ್ನು ಹಾಜರಾಗಿರುವಿರಾ?	(1) No ಇಲ್ಲ (2) Onceಒಂದು ಬಾರಿ (3) Twiceಎರಡು ಬಾರಿ (4) Thrice or more ಮೂರು ಬಾರಿ ಅಥವಾ ಹೆಚ್ಚು
Sec 3	Local Resource Person (LRP) Related Info[1020-1069] ಸ್ಥಳೀಯ ಮೂಲಭೂತಸೌಕರ್ಯದ ವ್ಯಕ್ತಿ	
32	Name of LRP who gave Ration Balancing advice [1070-1119] ರೇಷನ್ ಸಮತೋಲನ ಸಲಹೆಯನ್ನು	

	ನೀಡುವ ಎಲ್ ಅರ್ ಪಿ ಹೆಸರು	
33	Did the LRP brief you on benefits of RB initially? [1120] ಆರಂಭದಲ್ಲಿ ಆರ್ ಬಿಯ ಪ್ರಯೋಜನವನ್ನುಎಲ್ ಆರ್ ಪಿ ಸಂಕ್ಷಿಪ್ತವಾಗಿಸಿದೆಯಾ?	(1) Noಇಲ್ಲ (2) Yesಹೌದು
34	How many times has the LRP visited your household in last 3 months? [1121-1122] ಕಳೆದ ೩ ತಿಂಗಳಲ್ಲಿ ಎಷ್ಟು ಬಾರಿ ಎಲ್ ಆರ್ ಪಿ ನಿಮ್ಮ ಮನೆಯನ್ನುಭೇಟಿಯಾಗಿದ್ದಾರೆ	(1) 0, (2) 1, (3) 2, (4) 3, (5) 4 or more (specify the number)ಹೆಚ್ಚು (ಸಂಖ್ಯೆ ನಮೂದಿಸಿ).........................
35	Whether RB advice slip was given by LRP [1123] ಎಲ್ ಆರ್ ಪಿ ಆರ್ ಬಿ ಸಲಹೆ ಸ್ಲಿಪ್ ನ್ನು ನೀಡಿದೆಯಾ?	(1) No ಇಲ್ಲ (2) Yesಹೌದು
36	Whether advice slip is kept properly by the Farmer? [1124] ಎಲ್ ಆರ್ ಪಿ ಯಿಂದ ಸಲಹೆ ಸ್ಲಿಪ್ ನ್ನು ಇಡಲಾಗಿದೆಯಾ ಮತ್ತು ಪ್ರದರ್ಶಿಸಲಾಗಿದೆಯಾ?	(1) No ಇಲ್ಲ (2) Yes ಹೌದು

38	How satisfied are you with the services of LRP? [1125] ಎಲ್ ಆರ್ ಪಿ ಸೇವೆಯ ಜೊತೆ ನೀವು ತೃಪ್ತಿಯಾಗಿರುವಿರಾ?	1to 5 satisfaction rating on Extremely Satisfied to Extremely Dissatisfied ೧ ರಿಂದ ೫ ತೃಪ್ತಕರತೆಯ ಅಂಕದಲ್ಲಿ ಅತಿಯಾಗಿ ತೃಪ್ತಿಯಾಗಿರುವುದು ರಿಂದ ಅತಿಯಾಗಿ ಅತೃಪ್ತಿಯಾಗಿರುವುದು

1	2	3	4	5
Extremely Dis-satisfied ಅತಿಯಾಗಿ ಅತೃಪ್ತಿ ಯಾಗಿರು ವುದು				Extremely Satisfied ಅತಿಯಾಗಿ ತೃಪ್ತಿಯಾಗಿ ರುವುದು

39	How likely are you to recommend others to take	1to 5 rating on Very Likely to Definitely Not ೧ ರಿಂದ ೫ ಅಂಕಕ್ಕೆ ತುಂಬಾ ಇಷ್ಟವಾಗಿರುವುದ –ಖಂಡಿತ ಇಲ್ಲದಿರುವುದು

	services of this LRP? [1126] ಈ ಎಲ್ ಆರ್ ಪಿ ಸೇವೆಯನ್ನು ತೆಗೆದುಕೊಳ್ಳು ಎಷ್ಟು ಇಷ್ಟಪಟ್ಟು ಬೇರೆಯವರಿಗೆ ಶಿಫಾರಸ್ಸು ಮಾಡುವಿರಿ?	1 Definitely Not Likely ಖಂಡಿತ ಇಲ್ಲದಿರುವುದು	2	3	4	5 Very Likely ತುಂಬಾ ಇಷ್ಟವಾಗಿ ರುವುದ	
Sec 4	**Mineral Mixture Adoptability [1127-1176]** ಮಿನೆರಲ್ ಮಿಕ್ಚರ್						
40a	From whom did you learn about benefits of feeding of MM[1177-1196] ಎಂ ಎಂ ಫೀಡೀಂಗ್ ನ ಪ್ರಯೋಜನದ ಬಗ್ಗೆ ಯಾರಿಂದ ಕಲಿತಿರುವಿರಿ?		(1) From Milk union officers ಹಾಲಿನ ಯೂನಿಯನ್ ಅಧಿಕಾರಿಯಿಂದ (2) DCS staff,ಡಿಸಿಎಸ್ ಸಿಬ್ಬಂದಿ (3) LRP ಎಲ್ ಆರ್ ಪಿ (4) Local Vet Docಸ್ಥಳೀಯ ಪಶು ವೈದ್ಯರು (5) Others please specify () ಇತರೆ ದಯವಿಟ್ಟು ನಮೂದಿಸಿ)................................

	services of this LRP? [1126] ಈ ಎಲ್ ಆರ್ ಪಿ ಸೇವೆಯನ್ನು ತೆಗೆದುಕೊಳ್ಳು ಎಷ್ಟು ಇಷ್ಟಪಟ್ಟು ಬೇರೆಯವರಿಗೆ ಶಿಫಾರಸ್ಸು ಮಾಡುವಿರಿ?	1 Definitely Not Likely ಖಂಡಿತ ಇಲ್ಲದಿರುವುದು	2	3	4	5 Very Likely ತುಂಬಾ ಇಷ್ಟವಾಗಿ ರುವುದ	
Sec 4	**Mineral Mixture Adoptability [1127-1176]** ಮಿನೆರಲ್ ಮಿಕ್ಚರ್						

40a — From whom did you learn about benefits of feeding of MM[1177-1196] ಎಂ ಎಂ ಫೀಡೀಂಗ್ ನ ಪ್ರಯೋಜನದ ಬಗ್ಗೆ ಯಾರಿಂದ ಕಲಿತಿರುವಿರಿ?

(1) From Milk union officers ಹಾಲಿನ ಯೂನಿಯನ್ ಅಧಿಕಾರಿಯಿಂದ

(2) DCS staff,ಡಿಸಿಎಸ್ ಸಿಬ್ಬಂದಿ

(3) LRP ಎಲ್ ಆರ್ ಪಿ

(4) Local Vet Docಸ್ಥಳೀಯ ಪಶು ವೈದ್ಯರು

(5) Others please specify () ಇತರೆ ದಯವಿಟ್ಟು ನಮೂದಿಸಿ)................................

40 — When did you start feeding mineral mixture [1197] ಮಿನೆರಲ್ ಮಿಕ್ಚರ್ ನ್ನು ಯಾವಾಗ ಫೀಡ್ ನೀಡಲು ಪ್ರಾರಂಭಿಸಿರುವಿರಿ?

(1) Before RBP ಆರ್ ಪಿ ಪಿ ಮುನ್ನ

(2) After RBPಅರ್ ಪಿ ಬಿ ನಂತರ

41 — Average quantity of mineral mixture fed to milch animal /day at present ಹಿಂಡುವ ಪ್ರಾಣಿಗಳು/ಪ್ರಸ್ತುತದಲ್ಲಿನ ದಿನಕ್ಕಾಗಿ ನ ಮಿನೆರಲ್ ಮಿಕ್ಚರ್ ಫೀಡ್ ನ ಅಂದಾಜು ಗುಣಮಟ್ಟ

Before RBP [1198-1217] ಅರ್ ಬಿ ಪಿ ಮುನ್ನ	After RBP [1218-1237] ಅರ್ ಬಿ ಪಿ ನಂತರ
(1) Below 50 g ೫೦ಗ್ರಾಂ ಗೂ ಕೆಳಗೆ	(1) Below 50 g ೫೦ಗ್ರಾಂ ಗೂ ಕೆಳಗೆ
(2) 50-100 g೫೦-೧೦೦ ಗ್ರಾಂ	(2) 50-100 g೫೦-೧೦೦ ಗ್ರಾಂ
(3) 100-150 g ೧೦೦-೧೫೦ ಗ್ರಾಂ	(3) 100-150 g ೧೦೦-೧೫೦ ಗ್ರಾಂ
(4) more than 150 g- Specify................... ೧೫೦ಗ್ರಾಂ ಗೂ ಮೇಲ್ಪಟ್ಟು ನಮೂದಿಸಿ	(4) more than 150 g- Specify................... ೧೫೦ಗ್ರಾಂ ಗೂ ಮೇಲ್ಪಟ್ಟು ನಮೂದಿಸಿ

42 — Name & cost of mineral mixture used ಮಿನೆರಲ್

Name : ಹೆಸರು [1238-1287]

Cost (.......................Rs/kg) 1288-1295]

	ಮಿಕ್ಸರ್ ಬಳಸಿದ ವೆಚ್ಚ ಮತ್ತು ಹೆಸರು	ವೆಚ್ಚ(ರೂ/ಕೆಜಿ):
43	Source of mineral mixture ಮಿನೆರಲ್ ಮಿಕ್ಸರ್ ನ ಮೂಲ[1801-1820]	(1) Dairy cooperative society(DCS) ಡೈರಿ ಸಹಕಾರ ಸೊಸೈಟಿ(ಡಿಸಿಎಸ್) (2) Market ಮಾರುಕಟ್ಟೆ (3) Others specify ಇತರೆ ನಮೂದಿಸಿ..
44	Do you get regular supply of mineral mixture [1297] ಮಿನೆರಲ್ ಮಿಕ್ಸರ್ ನ ನಿಯತವಾದ ಸರಬರಾಜು ಪಡೆಯುವಿರಾ?	(1) No ಇಲ್ಲ (2) Yes ಹೌದು
45	What has happened to the cost of milk production per animal per day as result of feeding mineral mixture [1298] ಮಿನೆರಲ್ ಮಿಕ್ಸರ್ ನ ಫೀಡಿಂಗ್ ನ ಫಲಿತಾಂಶವಾಗಿ ಪ್ರತಿ ದಿನ ಪ್ರತಿ ಪ್ರಾಣಿಯ ಹಾಲಿನ ಉತ್ಪಾದನೆಯ ವೆಚ್ಚ ಏನಾಗಿದೆ?	(1) Increased, by how much [1299-1306] ಹೆಚ್ಚಿರುವುದು ಎಷ್ಟು (2)Decreased, by how much ಕಡಿಮೆ ಯಾಗಿರುವುದು ಎಷ್ಟು (3) Remained same ಹಾಗೆ ಉಳಿದಿರುವುದು
46	Are you following the recommended ration correctly [1307] ಶಿಫಾರಸ್ಸುಗೊಂಡ ರೇಷನ್ ನ್ನು ಸರಿಯಾಗಿ ಅನುಸರಿಸುತ್ತಿರುವಿರಾ?	1 Always ಯಾವಾಗಲೂ 2 Most of the times ಹೆಚ್ಚು ಬಾರಿಗಳು 3 Sometimesಕೆಲವೊಮ್ಮೆ 4 Only a few timesಕೆಲವು ಸಮಯ ಮಾತ್ರ 5 Never ಯಾವಾಗಲೂ ಇಲ್ಲ
47	Constraints in regular feeding of recommended ration (more than one reasons can apply) [1308-1327] ನಿಯತವಾದ ಫೀಡಿಂಗ್ ಶಿಫಾರಸ್ಸಿನ ನಿರ್ಬಂದಗಳು(ಒಂದಕ್ಕಿಂತ ಹೆಚ್ಚಿನ	(1) Not convinced with recommended ration ಶಿಫಾರಸ್ಸು ಗೊಂಡ ರೇಷನ್ ಜೊತೆ ಮನವರಿಕೆಯಾಗಿಲ್ಲ (2) Shortage of Mineral mixture ಮಿನೆರಲ್ ಮಿಕ್ಸರ್ ಕೊರತೆ (3) Frequent change in feed items ಫೀಡ್ ವಸ್ತುಗಳ ಆಗಾಗ್ಗೆ ಬದಲಾವಣೆ (4) LRP not visiting timely ಸಕಾಲಕ್ಕೆ ಎಲ್ ಆರ್ ಪಿ ಭೇಟಿಯಾಗುತ್ತಿಲ್ಲ

		(5) It is costly
	ಕಾರಣಗಳು ಅನ್ವಯಿಸುತ್ತದೆ)	ಇದು ದುಬಾರಿಯಾಗಿದೆ
		(6) Animal sold/died
		ಪ್ರಾಣಿಗಳ ಮಾರಾಟ/ಮರಣ
		(7) Others – specify
		ಇತರೆ
		ನಮೂದಿಸಿ..
48	In your experience, what are the benefits of RBP, multiple answer may apply [1328-1347] ನಿಮ್ಮ ಅನುಭವದಂತೆ ಆರ್ ಬಿ ಪಿಯ ಪ್ರಯೋಜನವೇನು? (ಹಲವು ಉತ್ತರಗಳು ಆನ್ವಯಿಸಬಹುದು)	(1) None ಏನು ಇಲ್ಲ (2) Milk yield increaseಹಾಲಿನ ಫಸಲು ಹೆಚ್ಚಿರುವುದು (3) Milk fat increaseಹಾಲಿನ ಕೊಬ್ಬು ಹೆಚ್ಚಿರುವುದು (4) SNF increase ಎಸ್ ಎನ್ ಎಫ್ ಹೆಚ್ಚಿರುವುದು (5) Feed cost decrease ಫೀಡ್ ವೆಚ್ಚ ಕಡಿಮೆಯಾಗಿದೆ (6) Better health of animal ಆತ್ಯುತ್ತಮವಾದ ಪ್ರಾಣಿಗಳ ಆರೋಗ್ಯ (7) Digestive disorders decreased ಜೀರ್ಣಕ್ರಿಯೆಯ ತೊಂದರೆ ಕಡಿಮೆಯಾಗಿರುವುದು (8) Increased fertility ಸಂತಾನೋತ್ಪದಿ ಹೆಚ್ಚಿರುವುದು (9) Others-specify ಇತರೆ ನಮೂದಿಸಿ.
49	Monthly savings from dairying after RBP [1348] ಆರ್ ಬಿ ಪಿ ನಂತರ ಡೈರಿಯ ತಿಂಗಳ ಉಳಿತಾಯ	(1) No changeಬದಲಾವಣೆ ಇಲ್ಲ (2) Decreased-Specify amount- ಕಡಿಮೆ ಇರುವುದು ಮೊತ್ತ ನಮೂದಿಸಿ (3) Increased-Specify amount-[1349-1356]ಹೆಚ್ಚಿರುವುದು ಮೊತ್ತ ನಮೂದಿಸಿ
50	Do you get any additional service from LRP [1357-1376]ಎಲ್ ಆರ್ ಪಿ ಯಿಂದ ಹೆಚ್ಚುವರಿ ಸೇವೆಯನ್ನು ಪಡೆದಿರುವಿರಾ?	(1) Supply of mineral mixture & feed supplementsಮಿನೆರಲ್ ಮಿಕ್ಚರ್ ಸರಬರಾಜು ಮತ್ತು ಸರಬರಾಜು ಫೀಡ್ (2) Information on dairy animal management ಡೈರಿ ಪ್ರಾಣಿಗಳ ಮ್ಯಾನೇಜ್ ಮೆಂಟ್ ಮಾಹಿತಿ (3) De-worming ಡಿ-ವಾರ್ಮಿಂಗ್ (4) Others – specify (like info on drinking water, chaffing, etc).ಇತರೆ-ನಮೂದಿಸಿ, (ಕುಡಿಯುವ ನೀರು;, ಚಾಫೀಂಗ್ ನಂತಹ

		ಮಾಹಿತಿ)..
51	Would you continue to avail RBP services if it is on chargeable basis [1377] ಬದಲಾವಣೆಯ ಆಧರಿಕೆಯಂತೆ ಆರ್ ಬಿ ಪಿ ಸೇವೆಯನ್ನು ಪಡೆಯಲು ಮುಂದುವರೆಸುವಿರಾ?	(1) No ಇಲ್ಲ (2) Yes (what is suitable amount) [1378-1385]...........ಹೌದು, (ಸೂಕ್ತವಾದ ಮೊತ್ತವೇನು)
Sec 5	Animal Information[1386-1435] ಪ್ರಾಣಿಗಳ **ಮಾಹಿತಿ**	
54	Ear tag no. of animal identified for impact study (may be multiple) [1436-1485] ಪರಿಣಾಮ ಅಧ್ಯಯನದಲ್ಲಿ ಪ್ರಾಣಿಗಳ ಗುರುತಿಸುವಿಕೆಯ ಇಯರ್ ಟ್ಯಾಗ್ (ಹಲವು ಇರಬಹುದು)	
55	Type of animal[1486-1488] ಪ್ರಾಣಿಗಳ ವಿಧ	(1)L Cow , ಎಲ್ ಹಸು (2)CB Cow, ಸಿಬಿ ಹಸು (3) Buffaloಎಮ್ಮೆ
56	Age of animal[1489-1490] ಪ್ರಾಣಿಗಳ ವಯಸ್ಸು	
57	Breed of animal[1491-1540] ಪ್ರಾಣಿಗಳ ತಳ	
58	Peak yield of animal (litres/day)ಪ್ರಾಣಿಗಳ ಫೀಕ್ ಫಸಲು(ಲೀಟರ್ ಗಳು∕ದಿನ)[1541-1548]	
59	Average milk yield (litres/day) [1549-1556] ಅಂದಾಜುಹಾಲಿನ ಫಸಲು (ಲೀಟರ್ ಗಳು∕ದಿನ)	

60	Lactation stage when RBP was initiated[1557-1559] ಆರ್ ಬಿ ಪಿ ಪ್ರಾರಂಭಗೊಂಡಾಗ ಲ್ಯಾಕ್ ಟೇಷನ್ ಹಂತ	(1)Early ಮುಂಚೆ (2) Mid ಮಿಡ್ (3) Late ನಿಧಾನವಾಗಿರುವುದು
60b	Current lactation stage of the animal[1560-1562] ಪ್ರಾಣಿಯ ಪ್ರಸ್ತುತ ಮೊಲೆಹಾಲು ಹಂತ	(1)Early ಆರಂಭಿಕ (2) Mid ಮಧ್ಯ (3) Late ಕೊನೆಯ
61	Change in milk yield ಹಾಲಿನ ಫಸಲಿನ ಬದಲಾವಣೆ After 2nd LRP visit [1563-1582] ೨ನೇ ಎಲ್ ಆರ್ ಪಿ ಭೇಟಿ ನಂತರ	(1) Reduced ಕಡಿಮೆಯಾಗಿರುವುಸ್ತು (2) 0 – 100 ml/day increase ೦-೧೦೦ ಎಂ ಎಲ್/.ದಿನ ಹೆಚ್ಚಿರುವುದು (3) 100 – 200ml/day increase ೧೦೦-೨೦೦ ಎಂ /ದಿನಕ್ಕೆ ಹೆಚ್ಚಿರುವುದು (4) More than 200 ml/day increase - specify quantity ದಿನಕ್ಕೆ/೨೦೦ ಎಂ ಎಲ್ ಹೆಚ್ಚಿರುವುದು/ಹೆಚ್ಚುವುದು ಪ್ರಮಾಣ ನಮೂದಿಸಿ
61 continued	after 3rd visit [1583-1602] ೩ನೇ ಭೇಟಿ ನಂತರ	(1) Reduced ಕಡಿಮೆಯಾಗಿರುವುಸ್ತು (2) 0 – 100 ml/day increase ೦-೧೦೦ ಎಂ ಎಲ್/.ದಿನ ಹೆಚ್ಚಿರುವುದು (3) 100 – 200ml/day increase ೧೦೦-೨೦೦ ಎಂ /ದಿನಕ್ಕೆ ಹೆಚ್ಚಿರುವುದು (4) More than 200 ml/day increase - specify quantity ದಿನಕ್ಕೆ/೨೦೦ ಎಂ ಎಲ್ ಹೆಚ್ಚಿರುವುದು/ಹೆಚ್ಚುವುದು ಪ್ರಮಾಣ ನಮೂದಿಸಿ
61 continued	after 4th visit [1603-1622] ೪ನೇ ಭೇಟಿ ನಂತರ	(1) Reduced ಕಡಿಮೆಯಾಗಿರುವುಸ್ತು (2) 0 – 100 ml/day increase ೦-೧೦೦ ಎಂ ಎಲ್/.ದಿನ ಹೆಚ್ಚಿರುವುದು (3) 100 – 200ml/day increase ೧೦೦-೨೦೦ ಎಂ /ದಿನಕ್ಕೆ ಹೆಚ್ಚಿರುವುದು (4) More than 200 ml/day increase - specify quantity ದಿನಕ್ಕೆ/೨೦೦ ಎಂ ಎಲ್ ಹೆಚ್ಚಿರುವುದು/ಹೆಚ್ಚುವುದು ಪ್ರಮಾಣ ನಮೂದಿಸಿ
62	How many times has the LRP visited your household in last 3 months? ಕಳೆದ ೩ ತಿಂಗಳಲ್ಲಿ ಎಷ್ಟು ಬಾರಿ ಎಲ್ ಆರ್ ಪಿ ನಿಮ್ಮ	(1) 0, (2) 1, (3) 2, (4) 3, (5) 4 or more (specify the number)ಹೆಚ್ಚು (ಸಂಖ್ಯೆ

	ಮನೆಯನ್ನುಭೇಟಿಯಾಗಿದ್ದಾರೆ	ನಮೂದಿಸಿ).........................	
62b	Average quantity of mineral mixture fed to milch animal /day at present ಹಿಂಡುವ ಪ್ರಾಣಿಗಳು/ಪ್ರಸ್ತುತದಲ್ಲಿನ ದಿನಕ್ಕಾಗಿ ನ ಮಿನೆರಲ್ ಮಿಕ್ಚರ್ ಫೀಡ್ ನ ಅಂದಾಜು ಗುಣಮಟ್ಟ	Before RBP [1736-1755] ಅರ್ ಬಿ ಪಿ ಮುನ್ನ	After RBP [1756-1775] ಅರ್ ಬಿ ಪಿ ನಂತರ
		(1) Below 50 g ಳಂಗ್ರಾಂ ಗೂ ಕೆಳಗೆ (2) 50-100 gಳಂ-೧೦೦ ಗ್ರಾಂ (3) 100-150 g ೧೦೦-೧ಳಂ ಗ್ರಾಂ (4) more than 150 g- Specify.................. ೧ಳಂಗ್ರಾಂ ಗೂ ಮೇಲ್ಬಟ್ಟು ನಮೂದಿಸಿ............................	(1) Below 50 g ಳಂಗ್ರಾಂ ಗೂ ಕೆಳಗೆ (2) 50-100 gಳಂ-೧೦೦ ಗ್ರಾಂ (3) 100-150 g ೧೦೦-೧ಳಂ ಗ್ರಾಂ (4)more than 150 g- Specify.................. ೧ಳಂಗ್ರಾಂ ಗೂ ಮೇಲ್ಬಟ್ಟು ನಮೂದಿಸಿ............................ ......

64	Average no. of inseminations required for animal to conceive
	ಪ್ರಾಣಿಗಳ ರೂಪಣೆಗಾಗಿ ಗರ್ಭದಾರಣೆಗೆ ಬೇಕಾದ ಅಂದಾಜು ಸಂಖ್ಯೆ
		COW ಹಸು
		  (1) [1633-1640]Before RBP - ಆರ್ ಬಿ ಪಿ ಮುನ್ನ
		  ....
		  (2) (2) [1641-1648]After RBP –ಆರ್ ಬಿ ಪಿ ನಂತರ
		  ....
		BUFFALO ಎಮ್ಮೆ
		  (1) [1649-1656]Before RBP - ಆರ್ ಬಿ ಪಿ ಮುನ್ನ
		  ....
		  (2) [1657-1664]After RBP –ಆರ್ ಬಿ ಪಿ ನಂತರ
		 	

65	Number of times farmer had to use veterinary treatment services, After RBP in last one year [1665] ಕಳೆದ ಒಂದು ವರ್ಷದಲ್ಲಿ ಆರ್ ಬಿ ಪಿ ನಂತರ, ಎಷ್ಟುಬಾರಿ ರೈತರು ಪಶು ಚಿಕಿತ್ಸಾ ಸೇವೆಯನ್ನು ಬಳಸಿದ್ದಾರೆ	(1) No change ಬದಲಾವಣೆ (2) Reduced ಕಡಿಮೆಯಾಗಿದೆ (3) Increased ಹೆಚ್ಚಾಗಿಗಿದೆ *Please provide number also[1666-1673] ದಯವಿಟ್ಟು ಸಂಖ್ಯೆಯನ್ನು ಕೂಡಾ ನಮೂದಿಸಿ	
65b	Improvement in health of animal after RBP [1683] ಆರ್ ಬಿ ಪಿ ನಂತರ ಪ್ರಾಣಿಗಳ	(1) Reduced ಕಡಿಮೆಯಾಗಿದೆ (2) No Change ಬದಲಾವಣೆ ಇಲ್ಲ	

	ಆರೋಗ್ಯ ಉತ್ತಮಗೊಂಡಿದೆ	(3) Improved ಉತ್ತಮಗೊಂಡಿದೆ
66	What kind of extra costs are involved in adopting the RBP [1684-1698] ಆರ್ ಬಿ ಪಿಯನ್ನು ಅಳವಡಿಕೊಂಡಿದ್ದಕ್ಕೆ ಯಾವ ರೀತಿಯ ಹೆಚ್ಚಿನ ವೆಚ್ಚವಾಗಿದೆ?	
67	Use of RBP saving [1699-1718] ಆರ್ ಬಿ ಪಿ ಉಳಿತಾಯದ ಬಳಕೆ	(1) Expansion of dairy herd ಡೈರಿ ಹರ್ಡ್ ನ ವಿಸ್ತಾರತೆ (2) Child health ಮಗು ಆರೋಗ್ಯ (3) Child education ಮಗು ಶಿಕ್ಷಣ (4) Other uses ಇತರೆ ಬಳಕೆ
68	Amount of feed waste after RBP [1719] ಆರ್ ಬಿ ಪಿ ನಂತರ ಫೀಡ್ ತ್ಯಾಜ್ಯದ ಮೊತ್ತ	(1) Reduced ಕಡಿಮೆ ಯಾಗಿದೆ (2) No Change ಬದಲಾವಣೆ ಇಲ್ಲ (3) Increased ಹೆಚ್ಚಾಗಿದೆ
69	What is average feed cost per day ಪ್ರತಿ ದಿನಕ್ಕೆ ಅಂದಾಜು ಫೀಡ್ ವೆಚ್ಚ ಏನು?	(1) Before RBP Cost Rs/ day [1720-1727] ದಿನಕ್ಕೆ/ರೂಪಾಯಿಯಲ್ಲಿ ಆರ್ ಬಿ ಪಿ ಮುನ್ನದ ವೆಚ್ಚ...................................... (2) After RBP Cost Rs/ day [1728-1735] ದಿನಕ್ಕೆ/ರೂಪಾಯಿಯಲ್ಲಿ ಆರ್ ಬಿಪಿ ವೆಚ್ಚದ ನಂತರದ್ದು..

Annexure 3: Household Questionnaire (Non-RBP group)

SCREENER QUESTIONNAIRE

CENTRE [7]	Bangalore Rural 01	Calicut 02						
GENDER [8]	Male 1	Female 2	**AGE [9]**	18-34 01	35-54 02	55+ 03

RESPONDENT'S NAME [10-59]	**:**	
ADDRESS [60-259]	**:**	
		PIN : [260-269]
TELEPHONE NO. [270-319]	**:**	
LOCATION / LANDMARK [320-369]	**:**	
EMAIL ID [370-419]	**:**	

FIELD CONTROL INFORMATION

Interviewer's name: _____Sign. _____Date _____ Time _____

Supervisor's name: _____Sign. _____Date _____ Time _____

Accompanied		**Scrutinised**		**Back Check**		**Center Code**	
TL	1	TL	1	TL	1		
EIC	2	EIC	2	EIC	2		
OFE	3	OFE	3	OFE	3		
FM	4	FM	4	FM	4		
PMT	5	PMT	5	PMT	5		
PM	6	PM	6	PM	6		

Signature   **Signature**   **Signature**

ANALYSIS OBSERVATIONS [420]	Extent of Problem:	No / Minor 1	Mild 2	Severe 3

Sr. No	Particulars ವಿಶಿಷ್ಟತೆ	Response ಪ್ರತಿಕ್ರಿಯೆ
Sec 1.	Qualifying Question for RBP HHs [421-470] ಆರ್ ಬಿ ಪಿ ಹೆಚ್ ಹೆಚ್ ಗಾಗಿ ಅರ್ಹತೆಯ ಪ್ರಶ್ನೆಗಳು	
1	Is there a milch cattle in the household [471] ಮನೆಯಲ್ಲಿ ಹಿಂಡುವ ಜಾನುವಾರು ಇದೆಯಾ?	Yes (1)ಹೌದು Noಇಲ್ಲ (2)
1b	Had received any RBP advice[472] ಯಾವುದೇ ಆರ್ ಬಿ ಪಿ ಸಲಹೆ ಸ್ವೀಕರಿಸಿದರು	Yes ಹೌದು / Noಇಲ್ಲ (if, No proceed further)
Sec 2.	HH Characteristics [473-522] ಹೆಚ್ ಹೆಚ್ ಗುಣಲಕ್ಷಣ	
2	Milk Union [523-572] ಹಾಲಿನ ಯೂನಿಯನ್	
3	District [573-622] ಜಿಲ್ಲೆ	
4	Taluk [623-672] ತಾಲ್ಕೋಕು	
5	Village Name [673-722] ಹಳ್ಳಿಯ ಹೆಸರು	
6	DCS Name [723-772] ಡಿಸಿಎಸ್ ಹೆಸರು	
7	Mobile No. [773-802] ಮೊಬೈಲ್ ಸಂಖ್ಯೆ	
8	Age [803-804] ವಯಸ್ಸು	
9	Gender [805] ಲಿಂಗ	(1) Male ಪುರುಷ (2)Female ಮಹಿಳೆ
10	Social category [806-807] ಸಾಮಾಜಿಕ ವರ್ಗ	(1) General ಸಾಮಾನ್ಯ (2) OBC ಓಬಿಸಿ (3) SC ಎಸ್ ಸಿ (4) ST ಎಸ್ ಟಿ

		(6) Others ಇತರೆ……………………………………
11	Education : [808] ಶಿಕ್ಷಣ	(1) Uneducatedಶಿಕ್ಷಣವಿಲ್ಲ (2) Primary ಪ್ರಾಥಮಿಕ (3) Higher secondary ಹೈಯರ್ ಸೆಕೆಂಡರ್ (4) Graduation & above ಗ್ರಾಜುಯೇಷನ್ ಮತ್ತು ಮೇಲ್ಪಟ್ಟು
12	Income category : [809] ಆದಾಯ ವರ್ಗ	(1) BPLಬಿಪಿಎಲ್ (2) APL ಮತ್ತು ಎಪಿ ಎಲ್
13.1	Total Annual Income [810-817] ಒಟ್ಟು ವಾರ್ಷಿಕ ಆದಾಯ	
13.2	Monthly household expenditure[818-825] ತಿಂಗಳ ಮನೆಯ ವೆಚ್ಚ	
14	Do you have access to internet? [826] ಇಂಟರ್ ನೆಟ್ ಸಂಪರ್ಕ ಹೊಂದಿರುವಿರಾ?	(1)Yes ಹೌದು (2)No ಇಲ್ಲ
15	Any family member working overseas? [827] ಓವರ್ ಸೀಸ್ ನಲ್ಲಿ ಯಾವುದಾದರೂ ಕುಟುಂಬದ ಸದಸ್ಯರುಕೆಲಸ ಮಾಡುತ್ತಿದ್ದಾರಾ?	(1)Yes ಹೌದು (2) Noಇಲ್ಲ
16	Any family member working in an Indian city? [828] ಭಾರತದ ನಗರದಲ್ಲಿ ಯಾವುದಾದರೂ ಕುಟುಂಬದ ಸದಸ್ಯರು ಕೆಲಸ ಮಾಡುತ್ತಿದ್ದಾರಾ?	(1)Yes ಹೌದು (2)No ಇಲ್ಲ
17	Total land holding (unit) : [829-836] ಹೊಂದಿರುವ ಒಟ್ಟು ಭೂಮಿ(ಯೂನಿಟ್)	
18	Type of land owned [837-856] ಹೊಂದಿರುವ ಒಟ್ಟು ಭೂಮಿ	(1) Cultivated ಕೃಷಿ (2) Fallow land ಪಾಳುಭೂಮಿ ಭೂಮಿ (3) Wasteland ತ್ಯಾಜ್ಯ ಭೂಮಿ (4) Forestland ಅರಣ್ಯ ಭೂಮಿ

		(5) Others (Specify)ಇತರೆ(ನಮೂದಿಸಿ)
19	Source of green fodder [857-876] ಹಸಿರು ಮೇವಿನ ಮೂಲ	(1) Cultivated on Own Land ಸ್ವಂತ ಭೂಮಿಯಲ್ಲಿ ಕೃಷಿ (2) Purchased from Market ಮಾರುಕಟ್ಟೆಯಿಂದ ಖರೀದಿಸಿರುವುದು (3) Cultivated on Panchayat Land ಪಂಚಾಯತ್ ಭೂಮಿಯಿಂದ ಕೃಷಿ (4) Cultivated on Forestland ಅರಣ್ಯ ಭೂಮಿಯಿಂದ ಕೃಷಿ (5) Cultivated on Lease land or Purchased directly from owner and cutting himself ಕೃಷಿಗಾಗಿ ಗುತ್ತಿಗೆ ಭೂಮಿ ಅಥವಾ ನೇರವಾಗಿ ಮಾಲೀಕರಿಂದ ಖರೀದಿಸಿರುವುದು ಮತ್ತು ಸ್ವತಃ ಕಟ್ಟಿಂಗ್ ಮಾಡುವುದು (6) Others (Specify) ಇತರೆ(ನಮೂದಿಸಿ)
20	For how many months in a year, green fodder is available from the above source/s? (put number of months) [877-878] ಮೇಲೆ ನಮೂದಿಸಿದ ಮೂಲದಿಂದ ವರ್ಷದಲ್ಲಿ ತಿಂಗಳಲ್ಲಿ ಎಷ್ಟುಬಾರಿ ಹಸಿರು ಮೇವು ಲಭ್ಯವಿದೆ? ಸಂಖ್ಯೆಯನ್ನು ತಿಂಗಳಲ್ಲಿ ಹಾಕಿರಿ)	(1) Cultivated on Own Land ಸ್ವಂತ ಭೂಮಿಯಿಂದ ಕೃಷಿ (2) Purchased from Market ಮಾರುಕಟ್ಟೆಯಿಂದ ಖರೀದಿಸಿರುವುದು (3) Cultivated on Panchayat Land ಪಂಚಾಯತ್ ಭೂಮಿಯಂತ ಕೃಷಿ (4) Cultivated on Forestland ಅರಣ್ಯ ಭೂಮಿಯಿಂದ ಕೃಷಿ (5) Others (Specify) ಇತರೆ(ನಮೂದಿಸಿ)
21	Animal feeding is mostly handled by [879-898] ಪ್ರಾಣೀಗಳ ಫೀಡಿಂಗ್ಸ್ ಹೆಚ್ಚಾಗಿ ನೀವು ನಿರ್ವಹಿಸುವಿರಾ?	(5) Adult male member of family ಕುಟುಂಬದಲ್ಲಿರುವ ವಯಸ್ಕ ಪುರುಷ ಸದಸ್ಯರು (6) Adult female member of family ಕುಟುಂಬದಲ್ಲಿರುವ ವಯಸ್ಕ ಮಹಿಳಾ ಸದಸ್ಯರು (3) Childrenಮಕ್ಕಳು (4) Hired worker ಬಾಡಿಗೆ ಕೆಲಸಗಾರರು (5) Others, Specifyಇತರೆ ನಮೂದಿಸಿ
22	Who decides the use of dairy income? [899]	(1) Adult male member of family

	ಡೈರಿ ಆದಾಯದ ಬಳಕೆಯನ್ನು ಯಾರು ನಿರ್ಧರಿಸುತ್ತಾರೆ	ಕುಟುಂಬದ ವಯಸ್ಕ ಪುರುಷ ಸದಸ್ಯರು (2) Adult female member of family ಕುಟುಂಬದ ವಯಸ್ಕ ಮಹಿಳಾ ಸದಸ್ಯರು (3) Both ಎರಡೂ
23	No. of Milch animals owned ಹಿಂಡುವ ಪ್ರಾಣಿಗಳನ್ನು ಹೊಂದಿರುವ ಸಂಖ್ಯೆ	Cow: [900-902]ಹಸು....................... Buffalo: [903-905]ಎಮ್ಮೆ......................
24	Have you attended any village awareness programme conducted by your milk union/DCS? (if yes, how many times?) [906] ಹಾಲಿನ ಯೂನಿಯನ್/ ಡಿಸಿಎಸ್ ಹಳ್ಳಿಯಲ್ಲಿ ಮಾಡಿದ ಯಾವುದಾದರೂ ತಿಳುವಳಿಕೆಯ ಕಾರ್ಯಕ್ರಮವನ್ನು ಹಾಜರಾಗಿರುವಿರಾ? ಹೌದು ಎಂದರೆ ಎಷ್ಟು ಬಾರಿ)	(1) No ಇಲ್ಲ (2) Once ಒಂದು ಬಾರಿ (3) Twice ಎರಡು ಬಾರಿ (4) Thrice or more ಮೂರು ಬಾರಿ ಅಥವಾ ಹೆಚ್ಚು
24b	Have you seen any extension material on RBP (multiple response may come) [907-926] ಆರ್ ಬಿ ಪಿ ಗಾಗಿ ಯಾವುದಾದರೂ ವಿಸ್ತಾರಗೊಂಡ ಮೆಟಿರಿಯಲ್ ನ್ನು ನೋಡಿರುವಿರಾ(ಹಲವು ಪ್ರತಿಕ್ರಿಯೆ ಬರಬಹುದು)	(1) Documentary/ film ಡಾಕ್ಯುಮೆಂಟರಿ/ಫಿಲ್ಮ್ (2) Poster ಪೋಸ್ಟರ್ (3) Banner ಬ್ಯಾನರ್ (4) Pamphlet ಕರಪತ್ರ (5) None ಯಾವುದು ಅಲ್ಲ (6) Others (specify) ಇತರೆ(ನಮೂದಿಸಿ)
25	Do you consult with any RBP farmer on cattle feed? [927] ಹಿಂಡುವ ಫೀಡ್ ಗಾಗಿ ಯಾವುದಾದರೂ ಆರ್ ಬಿ ಪಿ ರೈತರ ಜೊತೆ ಸಮಾಲೋಚನೆ ಮಾಡಿರುವಿರಾ?	(1)Yes ಹೌದು (2)No ಇಲ್ಲ
26	Did you get the choice to participate in RBP [928] ಆರ್ ಬಿ ಪಿ ಯಲ್ಲಿ ಭಾಗವಹಿಸಲು ಆಯ್ಕೆ	(1)Yes ಹೌದು (2)No ಇಲ್ಲ

	ಪಡೆದಿರುವಿರಾ	
27	If yes, then why did you not participate [929-948] ಹೌದು ಎಂದರೆ ಯಾಕೆ ಭಾಗವಹಿಸಿಲ್ಲ	(1) Not convinced by RBP ಆರ್ ಬಿ ಪಿ ಯಿಂದ ಮನವರಿಕೆ ಆಗಿಲ್ಲ (2) My animals are already healthy ನನ್ನ ಪ್ರಾಣಿಗಳು ಈಗಾಗಲೇ ಆರೋಗ್ಯವಾಗಿವೆ. (3) I feel my animals milk yield and fat are good hence no need ನನ್ನ ಪ್ರಾಣಿಗಳ ಹಾಲಿನ ಫಸಲು ಮತ್ತು ಕೊಬ್ಬು ಉತ್ತಮವಾಗಿದೆ ಎಂದು ಅನಿಸಿದೆ ಆದ್ದರಿಂದ ಬೇಕಾಗಿಲ್ಲ (4) Any other ಬೇರೆ ಯಾವುದಾದರೂ
28	If no, then why do you think so [949-963] ಇಲ್ಲ ಎಂದರೆ ಯಾಕೆ ಯೋಚಿಸಿಲ್ಲ	
Sec 3.	Mineral Mixture [964-1013]ಮಿನೆರಲ್ ಮಿಕ್ಚರ್	
29	Do you feed mineral mixture? [1014] ನೀವು ಮಿನೆರಲ್ ಮಿಕ್ಚರ್ ಫೀಡ್ ಹೊಂದಿರುವಿರಾ?	(1)Yes ಹೌದು (2)No ಇಲ್ಲ
30	If yes, how long have you been using mineral mixture? [1015-1018] ಹೌದು ಎಂದರೆ ಎಷ್ಟು ದಿನದಿಂದ ಮಿನೆರಲ್ ಮಿಕ್ಚರ್ ಬಳಸುತ್ತಿರುವಿರಿ?	Years and months ತಿಂಗಳು ಗಳು ಮತ್ತು ವರ್ಷಗಳು ………………………………………………
31	Average quantity of mineral mixture fed to milch animal /day at present [1019-1020] ಹಿಂದುವ ಪ್ರಾಣಿಗಳು/ಪ್ರಸ್ತುತದಲ್ಲಿನ ದಿನಕ್ಕಾಗಿ ನ ಮಿನೆರಲ್ ಮಿಕ್ಚರ್ ಫೀಡ್ ನ ಅಂದಾಜು ಗುಣಮಟ್ಟ		
		(1) Below 50 g ೫೦ಗ್ರಾಂ ಗೂ ಕೆಳಗೆ (2) 50-100 ಗ೫೦-೧೦೦ ಗ್ರಾಂ (3) 100-150 g ೧೦೦-೧೫೦ ಗ್ರಾಂ (4) more than 150 g- Specify ೧೫೦ಗ್ರಾಂ ಗೂ ಮೇಲ್ಬಟ್ಟು ನಮೂದಿಸಿ	

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32	Name & cost of mineral mixture used ಮಿನೆರಲ್ ಮಿಕ್ಸರ್ ಬಳಸಿದ ವೆಚ್ಚ ಮತ್ತು ಹೆಸರು	Name : ಹೆಸರು[1021-1070] ……………………………… Cost (Rs/kg) : ವೆಚ್ಚ(ರೂ/ಕೆಜಿ) [1071-1078] ………………………………
33	Source of mineral mixture [1079-1098] ಮಿನೆರಲ್ ಮಿಕ್ಸರ್ ನ ಮೂಲ	(1) Dairy cooperative society(DCS) ಡೈರಿ ಸಹಕಾರ ಸೊಸೈಟಿ(ಡಿಸಿಎಸ್) (2) Market ಮಾರುಕಟ್ಟೆ (3) Others specify like Govt. vet hospital ಇತರೆ ನಮೂದಿಸಿ, ಸರ್ಕಾರಿ, ಪಶು ಆಸ್ಪತ್ರೆ
34	Do you get regular supply of mineral mixture [1099] ಮಿನೆರಲ್ ಮಿಕ್ಸರ್ ನ ನಿಯತವಾದ ಸರಬರಾಜು ಪಡೆಯುವಿರಾ?	(1) No ಇಲ್ಲ (2) Yes ಹೌದು
35	What has happened to the cost of milk production per animal per day as result of feeding mineral mixture[1100] ಮಿನೆರಲ್ ಮಿಕ್ಸರ್ ನ ಫೀಡಿಂಗ್ ನ ಫಲಿತಾಂಶವಾಗಿ ಪ್ರತಿ ದಿನ ಪ್ರತಿ ಪ್ರಾಣಿಯ ಹಾಲಿನ ಉತ್ಪಾದನೆಯ ವೆಚ್ಚ ಏನಾಗಿದೆ?	(1) Increased, by how much[1101-1108] ಹೆಚ್ಚಿರುವುದು ಎಷ್ಟು (……………………………) (2) Decreased, by how much ಕಡಿಮೆಯಾಗಿರುವುದು ಎಷ್ಟು…………………… (3) Remained same ಹಾಗೆ ಉಳಿದಿದೆ
36	Constraints in regular feeding of ration (more than one reasons can apply) [1109-1128] ರೇಷನ್ ಶಿಫಾರಸ್ಸು ನ ನಿಯತವಾದ ಫೀಡಿಂಗ್ ನ ನಿರ್ಬಂದಗಳು(ಒಂದಕ್ಕಿಂತ ಹೆಚ್ಚಿನ ಕಾರಣ ಅನ್ವಯಿಸುತ್ತದೆ)	(1) Shortage of Mineral mixture ಮಿನೆರಲ್ ಮಿಕ್ಸರ್ ನ ಕೊರತೆ (2) Frequent change in feed items ಫೀಡ್ ವಸ್ತುಗಳ ನ್ನು ಅಗಾಗ್ಗೆ ಬದಲಾಯಿಸುವುದು (3) Feed items are costly ಫೀಡ್ ವಸ್ತುಗಳು ದುಬಾರಿಯಾಗಿದೆ (4) animal sold/died ಪ್ರಾಣಿಗಳು ಮಾರಾಟ ವಾಗಿದೆ/ಮರಣವಾಗಿದೆ (5) Others – specify ಇತರೆ-ನಮೂದಿಸಿ
37	Would you like to join RBP [1129] ನೀವು ಆರ್ ಬಿ ಪಿ ಯನ್ನು ಸೇರಲು	(1) Yes- specify reason ಹೌದು- ಕಾರಣ ನಮೂದಿಸಿ ………………………………

	ಇಚ್ಛಿಸುವಿರಾ?	(2) No – specify reason[1130-1144] ಇಲ್ಲ ಕಾರಣ ನಮೂದಿಸಿ ………………………………
Sec 4.	**Animal Information [1145-1194]** ವಾರ್ಷಿಕ ಮಾಹಿತಿ	
38	Type of animal [1333-1335] ಪ್ರಾಣಿಯ ವಿಧ	(1) L Cow , ಎಲ್ ಹಸು (2) CB Cow, ಸಿಬಿ ಹಸು (3) Buffalo ಎಮ್ಮೆ
39	Age of animal [1196-1197] ಪ್ರಾಣಿಯ ವಯಸ್ಸು	
40	Breed of animal [1198-1247] ಪ್ರಾಣಿಯ ತಳಿ	
41	Peak yield of animal (litres/day) in a lactation [1248-1255] ಪ್ರಾಣಿಯ ಫೀಕ್ ಫಸಲು(ಲೀಟರ್ ಗಳು/ದಿನ)	
42	Average yield of animal (litres/day) [1256-1263] ಪ್ರಾಣಿಗಳ ಅಂದಾಜು ಫಸಲು(ಲೀಟರ್ ಗಳು/ದಿನ)	
43	Milk yield at present (litres.day) [1264-1271] ಪ್ರಸ್ತುತದಲ್ಲಿ ಹಾಲಿನ ಫಸಲು(ಲೀಟರ್ ಗಳು,ದಿನ)	
44	Mineral Mixture fed to animal (grams/day) [1272-1279] ಪ್ರಾಣಿಗಳ ಮಿನೆರಲ್ ಮಿಕ್ಚರ್ ಫೀಡ್(ಗ್ರಾಂಗಳು/ದಿನ)	
45	Average no. of inseminations required for animal to conceive [1280-1287] ಪ್ರಾಣಿಗಳ ರೂಪಣೆಗಾಗಿ ಬೇಕಾದ	

		ಗರ್ಭದಾರಣೆಯ ಅಂದಾಜು ಸಂಖ್ಯೆ	
46	Number of times veterinary treatment services used in last year[1288-1295] ಕಳೆದ ೧ ವರ್ಷದಲ್ಲಿ ಬಳಸಿದ ಪಶು ಚಿಕಿತ್ಸಾ ಸೇವೆಯ ಸಂಖ್ಯೆಗಳು	
47	Is there any feed wastage [1296] ಯಾವುದಾದರೂ ಫೀಡ್ ತ್ಯಾಜ್ಯ ಇದೆಯಾ?	Yes/ No (Kilogram of feed wasted per day if Yes)...................................... [1297-1304] ಹೌದು/ಇಲ್ಲ(ಹೌದು ಎಂದರೆ ಪ್ರತಿ ದಿನ ತ್ಯಾಜ್ಯಗೊಂಡ ಫೀಡ್ ಕಿಲೋಗ್ರಾಂನಲ್ಲಿ)
48	What is average feed cost (Rs per day[1305-1312] ಅಂದಾಜು ಫೀಡ್ ವೆಚ್ಚವೇನು(ಪ್ರತಿದಿನಕ್ಕೆ ರೂಪಾಯಿಯಲ್ಲಿ)	
49	How do you decide feed composition for your milch animals[1313-1332]	(1) By Self ಸ್ವತಃ ನಾನೇ (2) Vet. Doc advice ಪಶು ವೈದ್ಯರ ಸಲಹೆ (3) Neighbor ಸುತ್ತಮುತ್ತಲಿನವರು (4) Family/ elder in family ಕುಟುಂಬದವರು/ಕುಟುಂಬದ ಹಿರಿಯರು (5) DCS/ Milk union officer or staff ಡಿಸಿಎಸ್/ಹಾಲಿನ ಯೂನಿಯನ್ ಅಧಿಕಾರಿ ಅಥವಾ ಸಿಬ್ಬಂದಿ (6) Internet ಇಂಟರ್ ನೆಟ್

Annexure 4: DCS Questionnaire

Interviewer Name _____		Date _____	
Respondent's name		Designation in DCS	
DCS Name		Name of the village	
Year of formation		Membership	Total:	Male:	Female:

Name of the LRP working in the village	
Time of start of RBP	Month/Year

Total DCS Membership	Before RBP:	After RBP:
Average milk collection in past 30 days	Before RBP:	After RBP:
Average milk fat %	Before RBP:	After RBP:
Average SNF %	Before RBP:	After RBP:
Average monthly mineral mixture sale (kg)	Before RBP:	After RBP:
Average monthly cattle feed sale	Before RBP:	After RBP:
What is the general opinion about RBP in the village?	( ) RBP is beneficial ( ) RBP is not beneficial	( ) Other, specify……………………………

Support presently provided by DCS for RBP (multiple answers)
( ) supply of mineral mixture ( ) LRP remuneration ( ) awareness campaigns ( ) display of RBP poster/banner ( ) Others- specify…………………………………………………………...…
No. of veterinary visits per year for treatment, after adopting RBP
( ) No change ( ) Reduced after adopting RBP ( ) Increased after adopting RBP ( ) Other………………………………
Do you feel RBP should be continued in the village?
( ) Yes ( ) No- specify why…………………………………… ( ) Other……………………………..

Is DCS paying some remuneration to LRP from own fund?	( ) Yes ( ) No
If no, is DCS ready to pay some remuneration to LRP from own fund?	( ) Yes, how much (Rs/month)………………………. ( ) No, why……………………………………………………
Is DCS providing some incentives to LRP?	( ) No ( ) Yes, specify (Item/amount)……………………………………..…………….
Do you feel LRPs can be utilized for some DCS activities also in future?	( ) No ( ) Yes, specify (activities) ………….. …………………………………………………………………
What support DCS is currently providing to LRP/RBP?	1……………………………………………
2…………………………………..	3………………………………………….
Has DCS organized any awareness program for the villages regarding RBP?	( ) Yes ( ) No

If yes, provide the detail	No of programs:	
Has EIA organized any awareness program for the villages regarding RBP?		( ) Yes ( ) No

If yes, provide the detail	No of programs:	

Any significant change noticed in the village after RBP (multiple answers)		
( ) No change ( ) Improvement in milk yield ( ) Improvement in milk quality		
( ) Improvement in fertility status of animals ( ) Reduction in disease incidence among milch animals		
( ) Improvement in income levels of farmers ( ) Others, specify………………………………………..		

What are the constraints in implementing RBP in your DCS?	1………………………...	
2……………………………………...	3…………………………………...	3…………………………………………

Do you have any suggestions to improve RBP in your DCS?	( ) No ( ) Yes, specify……………………………………

Annexure 5: LRP Questionnaire

Name of the LRP			Contact detail	Mobile/Phone………………..
Milk Union			Name of the DCS	
Age		Gender	M/F	Social Category	( ) General ( ) OBC ( ) SC ( ) ST ( ) Minorities
Education of LRP	( ) 10th std ( ) 12th std ( ) Graduation ( ) PG ( ) Other………….			
Occupations other than being LRP				

Monthly income as LRP	INR……….	Monthly income from other sources	INR………….	Total monthly income	INR……….

No & name(s) of the village(s) covered					
Household covered so far	Total:	SC:	ST:	OBC:	Minorities:
Animal registration under RBP	Total:		Male:		Female:
Time of start of RBP			Month/Year		

What are the sources of income as LRP? (multiple answers)	
MM commission	( ) No ( ) Yes, specify (income/unit)……………..
DCS contribution	( ) No ( ) Yes, specify………………………..
Milk Union contribution	( ) No ( ) Yes, specify………………………..
Charging from farmers	( ) No ( ) Yes, specify………………………..
Commission on sale of other items(Specify items and income/unit)	( ) No ( ) Yes, specify………………………..
Average time spent for RBP	Hours/day: Days/month:
Handling of RB software	( ) Difficult ( ) Easy ( ) very easy
If difficult, why?	
Do you get problems with software frequently?	( ) Yes ( ) No
If yes, mention the problems	1…………………………………………… 3……………………………………………… 2…………………………………………… 4………………………………………………
If yes, how do you handle the problems	
( ) mostly set it right by self ( ) mostly seek the help of other LRPs ( ) mostly seek the help from milk union officials ( ) Others, specify………………………………………………	

Do you require some modification / additional features in RBP software?	( ) No ( ) Yes, specify below	
1……………………………………..	2…………………………………….	3……………………………………
In addition to RBP software, do you have any other means of record keeping?		
( ) No ( ) Yes, specify………………………………………………………………………..		
How often do you visit a household which is taking RB services?		
( ) Once in a month ( ) Twice in a month ( ) On need basis ( ) Other, specify…………………………..		
How do farmers respond to your RB instructions?		
( ) They always follow the instructions ( ) Majority of farmers follow ( ) Very few farmers follow ( ) Other specify…………………………………….		
How do you ensure that farmers are following RBP?		
( ) by interaction with farmer during next visit ( ) follow up visit before due date of RB ( ) verifying over phone ( ) others- specify		

How do you recommend feed items to farmers?	
(a) Kg (b) converted to vessels/ bundles (c) Both (d) Other, specify…………………….	
While doing RB, with whom do you interact more often?	( ) Male ( ) Female ( ) Both
Do you give RB advice slip to farmers?	( ) Yes ( ) No
Do you give any additional services to farmers other than RBP?	( ) No ( ) Yes, specify………………………………………….
Awareness of farmers on RBP	(a) Less (b) Good (c) Excellent
As per your understanding what are the benefits of RBP?	1……………………………………………
2…………………………… 3……………………………….	4………………………………..
As per your understanding what are the benefits of RBP?	
( ) Inadequate mineral mixture supply ( ) Non-cooperation from farmers ( ) Frequent change of feed items ( ) Poor internet connectivity ( ) Software/ hardware problems ( ) Lack of support from DCS ( ) Lack of support from Milk Union ( ) Others-specify……………………………………………	
Has DCS organized any awareness program for the villages regarding RBP?	( ) No ( ) Yes, number:
Has EIA organized any awareness program for the villages regarding RBP?	( ) No ( ) Yes, number:
Whether the documentary on RBP was shown during VAPs?	( ) Yes ( ) No
No. of review meetings you have attended in last one year?	Number:………….
Is any printed material on RBP distributed to farmers?	( ) Yes ( ) No
Are RBP posters/banners displayed in the villages covered by you?	( ) Yes ( ) No
Have you observed any impact on your social status in the village after becoming LRP?	( ) Yes ( ) No

How many times have officers from Milk Union visited you in the last one year for monitoring your work?	
( ) Never ( ) 1-2 ( ) 2-4 ( ) More than 4	
What support do you receive from DCS?	
What additional support do you want from DCS?	
What trainings have you received till now?	Number: Subjects:
Have these trainings helped you?	( ) No ( ) Somewhat helpful ( ) Helped a lot
If 'no' or 'somewhat' why?	1. 2.
Do you require more training?	( ) Yes ( ) No
If yes, on what subject/topics?	
Any suggestions to make the RBP better in future?	1. 2. 3.
Do you think RBP would sustain in future	( ) Yes ( ) No ( ) Don't know
Do you have any suggestion to make RBP sustainable?	( ) Yes ( ) No
If yes, mention.	
Are you satisfied with your performance as LRP?	( ) Yes ( ) No ( ) Other……………………………..
If no, why?	