



Final Report

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LIST OF ACRONYMS

ACCD	Assistant Commissioner for Cooperative Development
ADB	Asian Development Bank
AI	Artificial Insemination
AOTR	Agreement Officer's Technical Representative
APDT	Annual Program Data Table
BLS	Baseline Survey
BOI	Bureau of Investment
CIC	CIC Agri Businesses Private Ltd.
DAPH	Department of Animal Production and Health
DEEP	Dairy Enhancement in Eastern Province
DSD	Divisional Secretariat Division
EIA	Environmental Impact Assessment
EUSL	Eastern University of Sri Lanka
FPR	Final Project Review
GOSL	Government of Sri Lanka
LDO	Livestock Development Officer
LOL	Land O'Lakes, Inc.
MASL	Mahaweli Authority of Sri Lanka
MCC	Milk Collection Center
MCP	Milk Collection Points
MOU	Memorandum of Understanding
MPC	Milk Processing Centre
MPG	Milk Producer Group
MW	Manmunai West
MWLBCS	Manmunai West Livestock Breeders Cooperative Society
NECCDEP	North East Coastal Community Development Project
PEER	Partnerships for Eastern Economic Revitalization
PWW	Prosperity World Wide
SDBL	Sanasa Development Bank Limited
USAID	United States Agency for International Development

Project Summary

Name of USAID Activity: Dairy Enhancement in the Eastern Province (DEEP) Project

Name of Implementing Partner: Land O'Lakes Inc. Dairy Development Lanka

Table 01: Funding Summary

Line Items	Budget US \$	Actual US \$
USAID	3,750,000.00	3,749,868
Cost Share	937,500	1,964,270
Leverage	5,372,965	4,879,931

Effective Date of Award: June 01, 2009 **Date of Completion:** May 31, 2012

Geographical Location: Eastern Province (Batticaloa and Trincomalee districts) and the border villages of Polonnaruwa district of Sri Lanka

Overall Goals and Objective/s:

To connect Eastern Province dairy farmers to the dairy value chain and increase economic opportunities for participating dairy farmers.

Expected Outcomes:

- Increase Quantity and Quality of Raw Milk through Targeted Training and Technical Assistance.
- Establish Milk Collection Centers and Forge Linkages with Milk Producer Groups
- Establish Modern Dairy Processing Facilities in a PEER Target Province

Private Partner: CIC Agri Businesses

Total beneficiaries over the life of the project: 4,439

Executive Summary

Dairy Enhancement in Eastern Province (DEEP) was funded by USAID Sri Lanka and implemented by Land O'Lakes, Inc. International Development. DEEP was funded under the Partnership for Eastern Economic Revitalization (PEER) program. DEEP had three major components to connect Eastern Province dairy farmers to the dairy value chain and increase economic opportunities for participating dairy farmers:

- 1) Component One- Increase the quantity and quality of raw milk through targeted training and technical assistance
- 2) Component Two- Establish milk Collection Centers (MCCs) and forge linkages with milk producer groups (MPGs)
- 3) Component Three- Establishment of modern dairy processing facilities

While the first two components were directly targeting the dairy farmers and mainly implemented by Land O'Lakes at the field level, the third component came under the purview of Leverage Partner CIC Agribusinesses. Land O'Lakes' contribution came in the form of international technical consultancies and provision of milk bowsers, equipment and buildings.

The project brought about several positive impacts within the farming community. A total number of 4,439 beneficiaries received support under the various DEEP activities such as the dairy technical training, association development training, milk quality testing, business management, entrepreneurship management, training programs on gender and conflict mitigation, pasture development, cash grants and flood relief. The project also resulted in the increase of milk prices and paved the way to increase farmer incomes. As recognition of these achievements DEEP was selected by USAID/Sri Lanka as the best Private and Public Alliance project out of ten such projects implemented in Sri Lanka.

The project faced several problems such as demoralized farmers, traditional farming methods of less quality, lack of investment, lack of knowledge of farmers, lack of infrastructure facilities for milk collection, weak and non functional grass root level institutions, low milk prices and low milk quality at the field level. DEEP also faced several problems and challenges in the form of adverse weather conditions, drought and floods, several administrative layers and delay in approval process and a relatively short life of the project, 3 years. Despite these constraints the project steered through and achieved its goals.

The Midterm Project Review commissioned by USAID and the Project Completion Review that was commissioned by Land O'Lakes showed several positive changes such as the change of attitude and behavior of farmers in farming methods adopted, traditional breeding to AI based breeding, rearing cross bred cows, increased interest in the health and nutrition of the animal, improved feeding methods and improved cattle sheds. Both reviews confirmed that these changes were mainly due to the Dairy Technical Training program that was conducted by DEEP. These reviews also observed increased quantity and quality of milk. The establishment of MCCs resulted in the increased milk collection and reduced spoilage to the bare minimum due to the supply of chilling tanks and testing equipment. Improved management of dairy cooperatives and good record keeping systems were observed. Intervention of CIC in the milk market resulted in the price increase and contributed towards the stabilization of the GOSL's guaranteed price for milk in the operational districts. As a result of this farmers

income had increased and the financial institutions and other private and government sector linkages were strengthened. Several state and private and state sector banks showed increased interest in giving loans for dairy farmers. In short, within the three year period DEEP was able to achieve its major objective of "To connect Eastern Province dairy farmers to the dairy value chain and increase economic opportunities for participating dairy farmers". The Final project Review confirms the sustainability of the project mainly through the institution building at the field level and the linkages that were established between the dairy farmers and private and state sector dairy service providers.

Background

The Eastern Province of Sri Lanka consisted of three districts: Ampara, Batticaloa and Trincomalee. While Batticaloa is prominently a Tamil speaking district with Tamil and Muslim ethnic groups, the other two districts are populated by Sinhala, Tamil and Muslim ethnic groups. This province had been playing a pivotal role in the production of paddy, milk and fishery products. This province had been contributing 15% of the milk production before the outbreak of the ethnic war. This contribution fell to around 2% – 3% due to the protracted ethnic war. The province lost its importance in the national dairy value chain and at the commencement of DEEP its link to the National Dairy Value Chain was almost nonexistent due to the 30 year ethnic war.

The dairy farmers who lived in these districts suffered a multitude of hardships in the form of loss of livelihood, lack of market for their products, isolation due to atrocities perpetrated by the warring factions and multiple displacements. They were highly marginalized and became poverty stricken due to the war. They had to undergo multiple displacements due to the war and lived in the refugee camps that were established by the GOSL authorities and UN and international agencies and INGOs. Displacement lasted for periods ranging from 3 months to 30 years. Families were either separated or lost their main bread winners. Thousands of women were widowed and without targeted support to improve their livelihoods.

With the end of the war they slowly started to return to their native places where their dwellings and livelihood assets were either robbed or destroyed due to the long duration of abandonment. Although the GOSL authorities and UN Agencies facilitated the process of resettlement in the war affected villages in the eastern province, the returnees did not receive proper livelihood support from any authorities. Some of the livelihood projects that were initiated with ADB and World Bank support showed interest in providing building facilities. However, they sometimes lacked proper community mobilization and technical support.

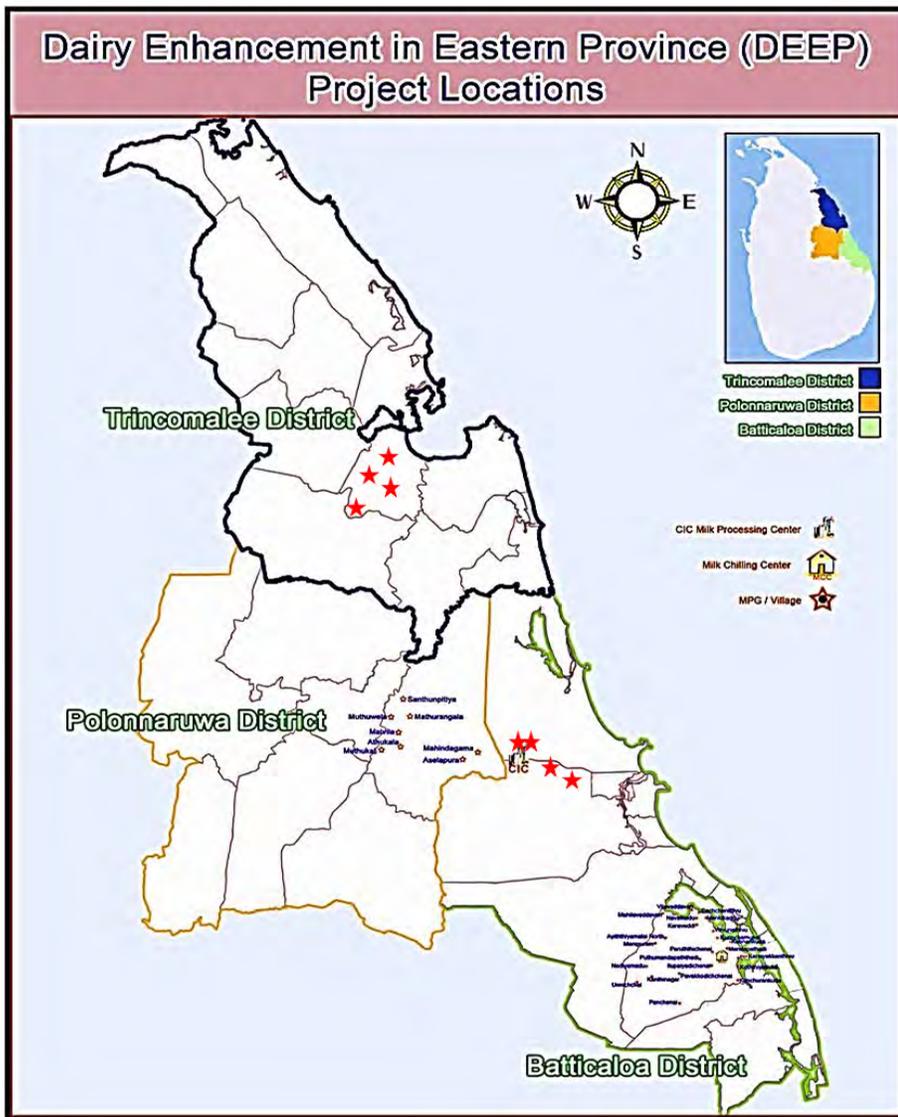
In addition to this, the infrastructure facilities were in shambles. Roads and bridges were damaged due to the prolonged war and resultant negligence. These facilities were not fully rehabilitated soon after the war and the people found it very difficult to take their produce to the nearby urban centers for marketing. Only paddy cultivation showed some improvements due to the investments made by rich land owners. The large majority of small scale farmers and agricultural laborers found it very difficult to commence their livelihood activities even after the end of war due to lack of capital.

In this context, USAID formulated the multi-pronged PEER with a view to revive the economic activities in the eastern province. Land O'Lakes DEEP project has been supported under the GDA funding through USAID. The main aim of DEEP was to focus on dairy sector in the province and improve the living standard of Eastern dairy farmers. At the beginning of the project the Eastern Province was

still suffering from the adverse impact of the war and was not in a position to develop its economic resources due to lack of investments and technical support. DEEP could be described as one of the first doses of livelihood investment specifically targeting the farming communities. The project was implemented in the Batticaloa and Trincomalee districts in the Eastern province and in the Welikanda DSD in the Polonnaruwa district. As there were some other USAID funded dairy related projects implemented by other institutions, DEEP did not move in to the Ampara district with a view to avoid duplication and conflict in between consultancy firms.

In the Batticaloa district DEEP was implemented in the following Divisional Secretariat Divisions (DSDs): Manmunai West, Koralaipattu, Koralaipattu South, Koralaipattu West and Koralaipattu Central; in the Trincomalee district Kinniya DSD and Thalgaswewa village in the Kantale DSD. In the Polonnaruwa district Welikanda DSD has been selected as it was situated bordering the Batticaloa district and severely affected by the war. The project locations are illustrated in the map below.

Figure 1: Project Area



Major Activities

Component One - Increased Quantity and Quality of Raw Milk through Targeted Training and Technical Assistance

Form 40 Milk Producer Groups within the project area:

In the formation of MPGs DEEP carried out several major activities such as Mobilization and Awareness Raising, Dairy Technical Training, Leadership and Team Dynamics, Good Cooperative Governance, Training programs to increase Gender Sensitivity and Conflict Sensitivity; this component also included disbursement of small cash grants, Artificial Insemination (AI) and distribution of grass cuttings.

Social Mobilization and Awareness Raising Process:

This activity necessitated highly grass roots oriented social mobilization within the war affected and resettled communities in the Batticaloa, Trincomalee and Polonnaruwa districts. Key community level CBOs such as the Livestock Breeders' Cooperative Societies, Rural Development Societies, Farmer Organizations etc. were nonfunctional and disorganized prior to DEEP.

Formation of Milk Producer Groups (MPGs):

One of the main objectives of the Social Mobilization and Awareness Raising process was to motivate the people to form groups and think collectively. The people who formed into groups were motivated either to get registered as a Cooperative or to join a Cooperative Federation. They were given the freedom to get registered with any other GOSL institutions as CBOs.

Artificial Insemination (AI): For the purpose of breeding, dairy farmers depended on the natural method of using a stud bull. It was costly and time consuming as the stud bull had to be brought from outside. The farmer awareness on AI was very poor and they were of the opinion that this process is against their religion and culture. DEEP tried to change this attitude and successfully carried out more than 1,000 AIs in the project area.

Pasture Development: The farmers were highly traditional minded and allowed their herds to graze freely. DEEP raised the awareness of the farmers the importance of developing pasture land and raising the cattle in semi intensive farming set up.

Capacity Building of MPGs and MCCs: This was carried out under component one and two. While component one focused more on the mobilization and Group formation and strengthening them with a view to build institutions within the villages and connect them with the respective MCCs. DEEP has conducted the following training programs during the project period:

1. Business Planning and Entrepreneurship Development
3. Cooperative Good Governance
4. Gender Sensitivity
5. Conflict Sensitivity
6. Leadership and Team Dynamics

Component Two - Establish Milk Collection Centers (MCCs) and forge linkages with milk producer groups (MPGs)

Major activities that were carried out under this component are given below:

Dairy Infrastructure Development: Under this component four MCCs have been established and they were provided with chilling tanks, vehicles, milk testing equipment, milk cans and furniture. All dairy groups and societies in a DSD were brought under the federation and motivated to supply milk to the MCCs.

Capacity Building: This took place in two ways as follows:

Dairy Record Keeping: As a Result of the long drawn out ethnic war, the societies had forgotten all good practices they had been following prior to the war. As most of the dairy cooperatives were disorganized or non functional, proper record keeping didn't take place. DEEP carried out a comprehensive practical training on this subject and followed it up at the field level to ensure compliance.

Technical Training: At the initial stage of the project DEEP observed that the farmers were not concerned about the quality of the milk and identified some poor practices such as mixing Hydrogen Peroxide to preserve the milk and mixing in water to increase the quantity of milk in certain areas. DEEP provided the cooperatives with milk testing equipment and trained the officials and employees in the use of them.

Component Three- Establish Modern Dairy Processing Facilities

DEEP Activities: DEEP mobilized and managed a consultant who provided engineering and equipment guidance for the establishment of a large Milk Processing Plant at Dambulla; DEEP also obtained two VEGA volunteers to provide advice for improving the efficiency of yogurt production at Punani Milk Processing Center and on the procurement of milk from the field efficiently. DEEP also supplied CIC with two Milk Bowsers with 9,000L capacity and supported CIC with approximately US \$ 300,000.00 to increase the production capacity of the Punani plant to process 5,000 liters of milk. DEEP also established linkages between MCCs/MPGs and CIC by facilitating the process of signing agreements with MCCs.

CIC Activities: CIC was involved in the Establishment of a Milk Processing Plant in Dambulla with a capacity process 20,000 liters of milk per day; CIC developed two dairy farms in the project area; developed pasture land; established a cattle feeding mill at Punani; established a Mini Milk Processing Plant at Punani; purchased milk from DEEP farmers one rupee above the other milk buyers; provided milk testing training; sold agricultural dairy inputs at whole sale price for DEEP farmers; and finally were involved in the facilitation of dairy loans from National Development Bank.

DEEP Methods of Technical Support and Assistance and Usage

Technical support was provided in the form of training the farmers, Cooperative Society officials and employees as per the need for such training programs. Dairy Technical Training could be treated as the primary training program. Altogether 4,160 farmers had been trained. Even non beneficiary large herd farmers also attended the program and as mentioned above this training has been well taken up by the farmers. Majority of the farmers are in a position to tell the content of what they learned. In addition to this observation shows that the farmers have used the knowledge they gained in the training programs for their benefits. This resulted in the increased milk production and quality improvement. Majority of the farmers willingly work within their group and take group based decisions. The results and impact of the Dairy Technical Program has been appreciated in the Final Project Review.

Disbursement of cash grants amounting to LKR 20,000 could be treated as another method of support for the dairy farmers. Farmers utilized the cash grants for supporting purchases of cross bred cattle or improving their cattle sheds. A few farmers utilized this amount to improve pasture land and to get water supply for the farm. As this was collectively monitored by the MCC and MPG officials as well as the DEEP staff members, there was no room left for misuse. Cash grants were released based on the criteria mentioned elsewhere in the report. These criteria were strictly adhered to by the Cooperatives and DEEP staff members in the selection of beneficiaries. Farmers were not motivated to misuse the cash grants as they had to make their own contribution.

Observation showed that in-kind grants were well utilized as the vehicles, machineries, milk cans, equipment and furniture that was procured were useful for the MCCS, MPGs and Mini Points in carrying out their work efficiently. The running charts that were maintained with the MCCs and MPGs show that the vehicles were not misused. In a village setting it is very difficult to misuse vehicles, as the members of the group used to question officials on the misuse of them. Farmers who used the 5 liter steel milk cans are proud of carrying them and showed interest in keeping them clean. Usage of five liter milk cans resulted in the reduction of plastic milk cans that get dirty quickly.

Challenges

DEEP faced many challenges from the beginning of its implementation. The war had severely affected the dairy services that were provided by the Department of Animal Production and Health (DAPH). In some areas the Dairy Cooperatives were either nonfunctional or were not in existence. At the commencement of the project several problems needed to be addressed, these are summarized below.

Low Self Esteem of Dairy Farmers: Dairy farmers were highly demoralized and not motivated to recommence their livelihood activities after the war due to multiple displacements. They had suffered physically and psychologically during the war. DEEP observed them suffering from low self-esteem and they did not treat their main livelihood, dairy farming, in a respectful manner. During field visit farmers didn't admit that they were involved in dairy farming. Almost all of them said that their main livelihood was paddy cultivation. Even those laborers who tilled the land gave the same answer. Only in Kinniya one farmer admitted that he and his villagers' main livelihood was dairy farming. During the mobilization phase DEEP focused its attention on this factor and motivated them to forget the past and face the future with self confidence.

Scattered Nature of Dairy Farmers: Almost all DEEP beneficiaries were involved in either paddy farming or worked as laborers in the paddy field. All paddy farmers were not involved in dairy farming. Except for a few villages, majority of the farmers lived far away from each other in remote villages. They were highly marginalized and lived in isolation. Further the Cooperatives, Farmer Organizations and Women's Groups that existed before the war were nonfunctional and after the war no action had been taken to revive them. As they were not well organized, they were exploited by the money lending middle men who kept them under their grip and prevented them from coming together as a group to bargain for better prices.

DEEP decided to make mobilization and awareness raising of farmers as its major strategy. Although it was difficult to do this within the community that was so used to living on handouts, DEEP was able break the barrier and increased their

awareness and mobilized them to get involved in their livelihoods. The mobilization and group formation exercises done by DEEP within the villages brought them together and motivated them to participate in the village level meetings that were conducted by the cooperatives.

Lack of Access to Inputs and Services: Although the DAPH was providing dairy services, the farmers who lived in far away villages were not in a position to receive them as the DAPH officials lacked resources to reach out to them. The majority of the service providers were based in the urban areas and they were not always concerned with sending their supplies to the far away villages as they lacked proper infrastructure facilities. Farmers were not provided with any livelihood support by the governmental organizations or International Development Agencies, INGOs and National NGOs, after the war. DEEP discussed these problems with the farmers during the mobilization phase and during the Dairy Technical training and promised them to provide some support in this connection and facilitate the process of establishing linkages with private and public sector Service Providers.

Subsistence Level Dairy Farming: Except for a few land owners, the majority of farmers lived on subsistence level farming. They were not used to thinking of farming as being profitable and lacked entrepreneurial and business skills. Further, as most of these farmers had been living on relief handouts provided by the GOSL, WFP, ICRC, INGOs etc. they also expected handouts from DEEP. DEEP developed criteria that beneficiaries should possess at least one cow, be active participants in dairying, be a member of the cooperative, should complete all five modules of Dairy Technical Training and provide their own efforts and contributions. DEEP conducted training programs in entrepreneurship development and business planning and showed the way for the society officials to manage the MPGs and MCCs as business ventures and with profit motive.

Lack of Technical Know-How: Mainly the dairy farmers lacked technical knowledge to run their dairy farms and knowledge on rearing cattle and farm management. Majority of the dairy farmers preferred open grazing and not concerned about having intensive or semi intensive dairy farms. Majority of them owned local cattle breeds whose productivity is poor. They were not interested in milking the cows and did not show any interest in their health and nutrition. As a result of this, productivity of the cattle population stood as low as 1 to 2 liters of milk per cow per day.

DEEP's Dairy Technical Training program addressed this problem and motivated the farmers to practice what they learned in the training programs. DEEP motivated them to commence their livelihood even with a few cattle. They were provided with Dairy Technical Training and training on Business planning, Entrepreneurship Skill Development, technical training etc. This gave them more ideas to get involved in their livelihood anew and look at dairy farming from a new lens. Through capacity building DEEP was able to educate them and subsequently change their behavior.

Non-functioning organizations: When DEEP went to the field the CBOs such as the Cooperative Societies, Farmer Organizations and Rural Development Societies were nonfunctional. DEEP consulted with DAPH, DS and ACCD of the district and gathered more information about these CBOs and traced them back and motivated them to reorganize and become functional groups. They were also motivated to form new societies and get registered with the relevant GOSL institutions. These CBOs were given training on group dynamics and leadership and governance and accountabilities. This exercise rejuvenated the non-functional CBOs and helped them to function efficiently.

Lack of Milk Collection Mechanism: Although a few farmers were involved in dairy farming and milking the cows, they lacked a proper mechanism to collect milk and bargain for a good price. There was no marketing network. Under this condition the middlemen thrived. DEEP succeeded in the formation of new dairy cooperatives and reviving the non functional ones. DEEP constructed MCC, MPG and Mini Points to collect milk from all farmers and collect them at the MCC to be sold to the buyers.

Low Farm Gate Price: As a result of the above, middlemen benefited, in fact they were the ones who fixed the price for the milk. The majority of the farmers were trapped by middlemen's advance system and they could not find a way to escape from it. DEEP introduced CIC as a new buyer. This resulted in the increased competition and resulted in the price increase.

Lack of Data: It was difficult to get formal data from the GOSL institutions as they too have actually moved in to the field with the end of the 30 year war. DEEP was able to get the support of some government institutions such as the EUSL, MILCO and DAPH in determining the actual data related to dairy sector.

Low Female Participation: Female participation at project start-up in the dairy sector stood as low as 6% in the baseline survey and Gender Sensitivity study. As DEEP aimed at increasing female participation up to 45% at the end of the project, the DEEP Team took extra care to ensure this at all stages of the project.

Increasing Competition: Dairy farmers were of the view that there are only a few milk buyers and they were compelled to sell their milk only to them. DEEP was able break this mentality by bringing in new buyers. When CIC said that they were not in a position to buy milk from Manmunai West MCC in early 2010, DEEP negotiated with Nestle to buy milk from them and still this relationship exists. Now both companies, CIC and Nestle, are buying milk from Manmunai West MCC. Several milk buying and processing companies and prospective dairy investors approached DEEP for advice and collaboration. DEEP kept the momentum in the market by talking to all of them.

Obtaining Dairy Expertise: Dairy expertise in the Eastern Province was limited so DEEP had to build up its staff to be the experts. Consultants were brought in when available as well.

Other constraints that DEEP faced that are notable but not under the control of the project were:

- Short life of the project
- Administrative structure and policies of the GOSL
- Delays in getting necessary approvals
- Adverse Weather Conditions including droughts and floods in the Eastern Province

DEEP Lessons Learned

Changes in Farming Practices are Possible: DEEP activities resulted in changing the farmers attitudes and behaviors. For example, when DEEP was planning to implement AI, Batticaloa DAPH officials were skeptic about its success due to their own experience of conducting 29 AIs in a year. Within a two year period DEEP had carried out 1,138 AI. This shows that given the proper awareness, farmers attitude could be changed. A wide range of additional changes in farming practices were perceptible, including a willingness to focus on

herd quality over quantity, openness to constructing cowsheds and moving away from free-grazing, purchasing productivity-enhancing inputs, and actively making use of available veterinary services.

From Relief to Development: DEEP began shortly after the culmination of the 26-year civil war, and the vast majority of farming families in the area had been internally displaced multiple times and forced to live in refugee camps at various points. The assistance they received in these settings from the Sri Lankan government, NGOs and intergovernmental agencies was invariably in the form of hand-outs of food, shelter and livelihood inputs. When Eastern Province farmers first learned that DEEP would require them to invest their own time and material resources as a precondition for participation, many flatly refused to participate, and there was a general sense of resistance. But, as farmers learned more about the DEEP grants and training they would receive, participation started to increase. Those who didn't own a cow purchased one, some began selling their unproductive animals for improved-breed in-calf heifers, and still others went in search of their local Livestock Breeders Cooperative Society to apply for membership. Ultimately, the majority of farmers accepted the DEEP beneficiary requirements and became active dairy farmers.

Flexible Training Sessions Enhanced Female Participation and Leadership: Despite historically low levels of female participation in dairy trainings (only 6 percent of those interviewed during the baseline said their husbands supported them to attend such meetings), DEEP proposed to achieve 45% female participation by the end of the project. Many considered this to be an unusually high target at the outset, since women are not typically considered the owners of livestock, even when they are their primary caregivers. Initially, there were indeed far more than women at both the community meetings and DEEP trainings. When it became evident that male participation at trainings was erratic due to their involvement in paddy cultivation and in other income generating activities, DEEP staff explicitly encouraged female participation by making it clear that women could represent their husbands or fathers at the training programs. Female participation surged as a result, particularly in Manmunai West, where it reached over 50%. Many men in DEEP communities also began to change their mindsets, and acknowledged that women should be the ones who were trained, given their primary roles in dairy work. Through DEEP, many women advanced to leadership positions in DEEP cooperatives, and gained employment through the MPGs and milk collection points. By the end of the program, 44% of those attending DEEP trainings were women, as were 47% of those who received cash grants through the program.

Even Non-Beneficiary Farmers Were Influenced by DEEP: Although DEEP focused on assisting around 4,000 beneficiary farmers, the program also impacted non-beneficiary farmers. As described earlier, few farmers showed interest in the project during initial community mobilization efforts, with some doubting how a dairy-specific program in their areas could succeed. But as the training program expanded, increasing numbers of farmers attended, including some large-scale farmers who did not qualify for grants, but simply wanted to enhance their education. When the beneficiary farmers showed more interest in buying thoroughbred cows, non-beneficiary farmers too showed interest in purchasing such cows; the same effect was observed regarding the construction of improved cattle sheds and pasture development. Meanwhile, farmers who were not members of cooperatives showed interest in supplying milk to the MCC instead of the middleman due to the higher price and regular payment.

Technology Helped Connect Remote Farmers with Resources: Few farmers noted historical success in receiving assistance from Livestock Development Officers or Veterinary Surgeons to care for their sick animals. But DEEP staff

members were able to establish positive relationships with the government dairy officials, and got their consent to share their mobile numbers with DEEP farmers. This became an effective mechanism for them to receive better veterinary support, especially in more remote areas, as they could virtually describe the symptoms they had observed and find out what medicine was needed. Residents also began regularly calling government vets as well as Para Vets trained through DEEP to report when their animals were in heat and ready for AI, or when the birth of a calf was imminent.

Policies, Not Seasonality, Affects Milk Collections: On the first day the Manmunai West MCC reopened, it only collected 49 liters of milk. The daily collections gradually increased and peaked around 1,500 liters per day. But DEEP staff also observed a clear downward trend from August to December 2010. On the final day of December 2010, the monthly collection was only 64 Liters. When we discussed this with the cooperative and officials from the Department of Animal Production and Health, the explanation provided was that it was the lean season of poor rains. However, DEEP staff members were skeptical that seasonality could have such a large impact, since the area has enough fodder to sustain the animals. In fact, it was Sri Lankan government orders that animals be herded to the jungles to make way for paddy farming that resulted in such low milk collections. By establishing innovative collection routes and vehicles that would enable milk collection in remote jungle areas, and also encouraging the building of cow sheds that would obviate the need to relocate their animals, DEEP was able to ensure that milk collection did not experience a similar decrease during the same time frame in 2011.

Survey and Studies Implemented by DEEP

Survey/Studies: DEEP Project conducted a Base Line Survey, Association Development Study, Gender Sensitivity Study and Conflict Sensitivity Study. In addition to these studies, five Environmental Impact Assessments were carried out as a prerequisite for the establishment of MCCs. DEEP also carried out a Gap Analysis during the second year of the project.

Baseline Survey: In the absence of formal data, the project hired the Eastern University to carry out a Baseline Survey (BLS) in the Batticaloa and Trincomalee districts. The survey pointed out that although the government's dairy processing arm, MILCO is involved in the purchase of milk, more quantities had been purchased by middlemen and the private sector. The BLS estimated the average milk price at LKR 29/- per liter and this had not motivated the farmers to show interest in dairy farming. DEEP project expected to increase female participation to 45% at the end of the project. The BLS finding showed that female participation was around 6%. Based on the findings of the BLS, DEEP developed its Annual Performance Data Table (APDT) which was updated at the end of each quarter.

Study on Gender Sensitivity: DEEP proposed to increase the female dairy farmer participation to 45% at the end of the project. A Gender Sensitivity Study was carried out by a Gender Specialist and it was confirmed that only 6% of females admitted that they own cows and they are involved in the dairy sector, a fact learned from the BLS. The Gender Survey pointed out that while men showed ownership for the animals around 80% of animal care work was done by females. The study also pointed out that there were more women who say that they brought cows as dowry and added them to their husbands' existing herds. In this context, DEEP set the target to reach at 45% of the female beneficiaries at

the end of the project. Although it looked a daunting task as the BLS and Gender Survey showed the female participation around 6% in the dairy sector.

Association Development Study: During the early phase of DEEP - September and October, 2009 - Mr. E.G. Nadeau, Association Development Consultant from USA, visited Sri Lanka and had several rounds of discussions with DEEP staff members, Chief Executive of CIC and visited the field in the Batticaloa, Trincomalee and Polonnaruwa districts and assessed the field situation and gave his recommendations for Association Development process. This study also gave recommendations on the gradual process of establishing the MCC at Manmunai West. This report also recommended the types of training programs that should be conducted for the officials who represent the Cooperative Federation, MCC staff members, MPG officials and the members of the cooperative societies. The consultant also recommended the importance of conducting business oriented training programs for the cooperatives.

Study on Conflict Sensitivity: The project also aimed at preventing conflicts along the Milk Value Chain and reaching out to farmers who belonged to different communities. The conflict Sensitivity Study that was conducted by the Peace Development Institute of Sri Lanka (PDISL) pointed out inter and intra conflicts within the Milk Value Chain. The study recommended conducting training programs on "Conflict Sensitivity" for cooperative officials and members. DEEP conducted these programs by mixing members from different communities. The project aimed at bringing together Muslim, Sinhalese and Tamil farmers in the MPGs and MCCs. The training programs that were conducted on "Conflict Sensitivity" facilitated the process of bringing different communities together and resulted in the formation of MPGs or MCCs with different community representation.

GAP Analysis: This study was carried out by Dr. Tissa Jayatilaka and Dr. Bandara who are well experienced in this field and regarded as experts in livestock development in Sri Lanka. These two consultants went in to the interior villages in the project area to observe what has been happening relative to the DEEP project. GAP Analysis identified several major issues that were faced by the farmers in the project areas. The farmers lacked proper dairy services in the field and linkages with private service providers. Dependency on middlemen forced the farmers to borrow from them and they were caught in the vicious circle of debt. They were also confused due to the lack of pasture land and non-demarcation of district boundaries soon after the war. The Milk Value Chain was broken and lacked vibrancy.

This analysis identified some weaknesses that were prevalent amongst the farmers in the following terms, "Majority of farmers have no bargaining power to rectify this situation, being, fragmented or voiceless, survival is yet assured through risk aversion strategies".

The report also highlighted the problem related to the pasture land and lack of water during drought season, *"Limited access to grazing lands, lack of grazing during both wet and dry seasons, shortage of drinking water during the dry period and prevailing competition with other socio economic activities for land and water."*

They held three workshops in the Batticaloa, Trincomalee and Polonnaruwa districts with the participation of dairy farmers and public and private sector stakeholders. They identified major gaps in the Milk Value Chain and offered recommendations and advise on how to set up the linkages between several stakeholders. They were instrumental in increasing the awareness and interest of

the banks and insurance company representatives in reaching out to the dairy farmers in these districts.

Final Project Review

DEEP hired the Eastern University of Sri Lanka to carry out the Final Project Review. As they already conducted the Baseline Study for DEEP, they were well placed to compare the pre project situation and post project changes. A full copy of their report is attached as Annex B. The Final Review covered all operational areas and considered the percentage gender and ethnic ratios of the beneficiaries. This review found that DEEP was able to achieve most of its targets and brought about some positive changes amongst the dairy farmers. According to the report the quality of milk has improved considerably due to the technical training programs that were conducted by DEEP. The study observed some positive changes from the traditional farming system to semi intensive farming system. The study highlighted the change amongst the beneficiaries in the adoption of AI in place of natural breeding. They also observed an increase in the number of cross bred cows due to DEEP activities. The study acknowledged the efforts made to establish MPGs, MCCs and Mini Collection points and the way they were connected to each other. This point was emphasized as a major factor in the sustainability of the project. The study also highlighted the increased price for milk and increased enthusiasm within the farming community in making investments in the sector. The study praised the increased participation of females in the dairy sector. Overall, this study proved that DEEP project was able to achieve all its activities included in the APDT.

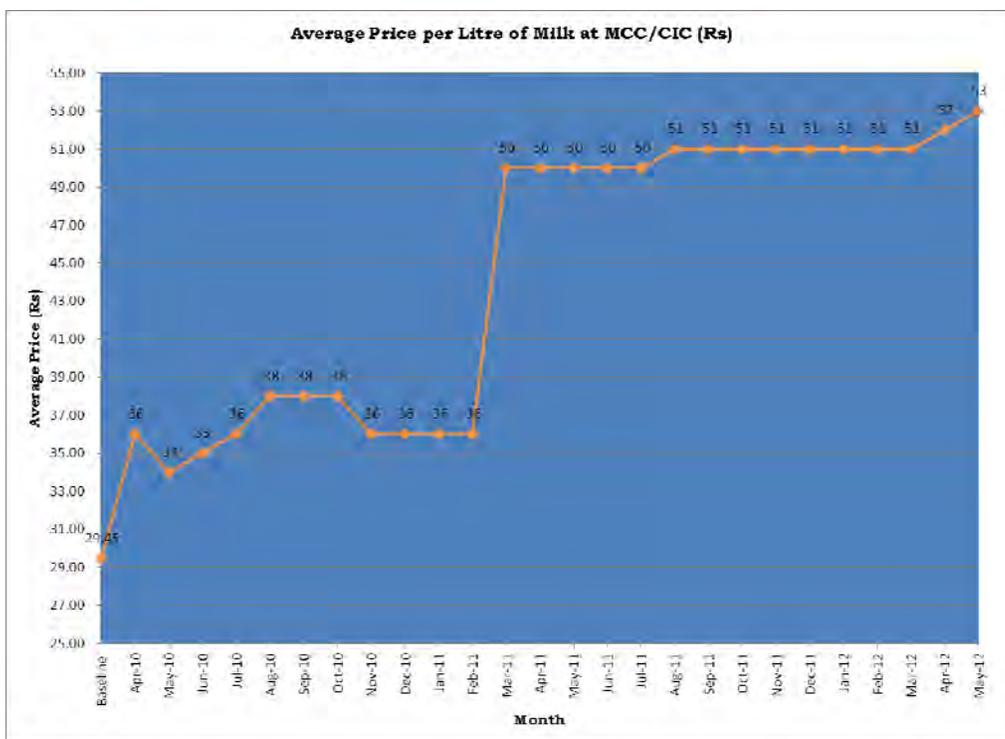
Project Performance and Results - Analysis of APDT

Overall Objective: To connect Eastern Province dairy farmers to the dairy value chain and increase economic opportunities for participating dairy farmers.

Indicator: Increase in dairy-related annual income

Implementation of DEEP project has resulted in the increase of net revenue of beneficiary farmers through the sale of milk. The Baseline Survey that was conducted during the initial stage of the project showed the average price per liter as Rs. 29.45. This is price had been arrived at by generalizing the data collected in the three different districts. There were farmers who were selling milk at LKR 15/- per liter to the middlemen on whom they depended for cash advances. Figure 2 below shows the average price of per liter of milk paid by Nestle and CIC for all four MCCs. Specifically, with effect from January 2012 almost all MCCs were supplying milk either to Nestle or to CIC or for both buyers. The figure below depicts the price history of milk with effect from April 2010 to May 2012.

Figure 2: Average Price of Milk



(Data Source: MCC Milk Collection & Selling Data)

According to the baseline report, the estimated annual income of a farmer with one (traditional) milking cow was LKR 8,163.54 at the rate of the baseline price of LKR 29.45 per liter. The situation in the distant and isolated villages may not be the same. If we generalize the new price for all and compare it with the above annual income, the farmers' annual income will increase up to LKR 20,000.00 from a traditional milking cow.

During April 2010, of milk collection the price jumped to LKR 36/- mainly due to DEEP intervention and its ability to persuade Nestle to buy milk from MWLBCS MCC. Again in the month of March 2011 there was a big jump in milk price from LKR 36/- per liter to LKR 50/- per liter. Although the government had increased the price for a liter of milk to LKR 50/-, the buyers did not pay this price for some time despite the repeated appeal by the government. This jump in the price occurred in March 2011 mainly due to the intervention of CIC and its readiness to pay LKR 50/- per liter. Other buyers were compelled to pay this amount throughout Batticaloa and Polonnaruwa. Later on CIC took a decision to pay one rupee above the price that is paid by other buyers. This offer was made by CIC during the discussion that was held between the MWLBCS and CIC prior to the signing of milk buying agreement. As a result of this policy CIC paid LKR 51/- per liter for all its suppliers in Batticaloa and Polonnaruwa. This price has gone up to LKR 52/- in April 2012 and LKR 53/- in May 2012. This is an increase of 80%. The Final Project Review conducted by the EUSL said: **"DEEP intervention had helped increase the price of milk per liter from Rs. 29/- (Baseline value) to Rs. 36/- (current price); while the CIC is offering Rs. 51/- per liter to farmers."**

The BLS that was conducted by DEEP showed that the value of milk produced per household was RS. 293.50. The study commissioned by DEEP on the *"Analysis of Household Milk Collection Monitoring Data and Field Survey Data, 2011/12"* showed this has increased up to Rs. 837/- after the intervention of DEEP. This is

an increase of 185%. One point to be noted here is that while the BLS focused on Batticaloa, Trincomalee and Polonnaruwa districts, DEEP analysis in 2012 focused only on the MPGs in the Batticaloa district.

According to the *Final Project Review* DEEP has resulted in the increase of income for the dairy farmers, see Table 1 below. The dairy household income of less than LKR 5,000/- per month was among 60.85% of households before the project, while this figure declined to 57.1% after DEEP intervention. It is very important to note that within these income categories farmers who earned less than LKR 1,000/- went down from 28.84% to 16.93%; this shows a decrease of around 12%. At the same time, the income category of LKR 3,001/- to LKR 5,000/- shows an increase of 6.62% and the income category of LKR 5,001 to 10,000/- shows an increase of 12.96%. This clearly shows that the percentage decrease of 16.93% that had occurred in the less than LKR 1,000/- category has actually shifted to the income categories of LKR 3,001/- to LKR 5,000/- and LKR 5,001/- to LKR 10,000/-. We will have to arrive at this conclusion mainly due to the 1.58% increase in the LKR 1,001 to LKR 3,000/-. Meanwhile the percent of households receiving dairy income above Rs.5,000 per month was 11.3% which later had increased to 34.3%. This increase had tremendous impact on the household expenses on personal as well as dairy related activities.

Table 2: Changes in monthly income

Monthly Income (Rs.)	Before	Percent	After	Percent
< than 1,000	109	28.84	64	16.93
1,001 -3,000	85	22.49	91	24.07
3,001 – 5,000	36	9.52	61	16.14
5,001-10,000	26	6.88	75	19.84
> than 10,000	17	4.50	55	14.55
Missing /non-responses	105	27.78	32	8.47
	N=378	100	378	100

According to the *Household Milk Collection Monitoring Data and Field Survey Data, 2011/12* DEEP intervention has brought about a big change in the number of days the farmers were involved in milking their cows. *“Improved access to herds is showing average of 280 milking days in a year and the milking days ranges from 178 days in a year (Kothiyapulai) to 351 Days (Karayakkantheevu)”*. As a result of this the volume of milk production has gone up and this too had resulted in the increased income for the farmers.

It was observed and admitted by the farmers that their milk production has increased mainly due to the increase in the price and income. They also reported that they were able to change some of their old practices and increase the milk production due to the knowledge they gained through the training programs. In addition to the technical training programs, farmers have received training on entrepreneurship training and business planning.

Indicator: Number of Smallholder dairy farmers benefiting from DEEP activities

DEEP project aimed to support 4,000 participating households consisting of 20,000 family members. These households received technical assistance and/or trainings, new technologies and small grants aimed at increasing their dairy related income. DEEP has disbursed a total number of 3,510 cash grants during the life of the project. Table 2 below shows the smallholder dairy farmers who have benefited from DEEP support by the end of the project.

DEEP Beneficiary Requirements

- Own at least one cow
- Membership in a Livestock Breeders Cooperative Society
- Actively engage in dairy farming
- Participation in the DEEP training program
- Willing and able to contribute their own funds to match the DEEP grants for purchasing an improved breed animal or constructing a cattle shed

Table 3: Major Activities by Gender

List of Activity	Male	%	Female	%	No of Beneficiaries
Training and Technical Support	2,341	56	1,819	44	4,160
Animal Breeding (AI support)	846	75	275	25	1,121
Cash Grants	1,872	54	1,638	46	3,510
Distribution of Grass Cuttings	339	94	22	06	361
Actual No of Beneficiaries	2,493	56	1,943	44	4,436*

*Note: The farmers who enrolled in the training program will be entitled for the other assistance as listed above. The farmer who completes the full training package will be eligible for the small grants assistance. The total number of farmers who have benefitted from the various activities has increased to 4,436.

Gender Ratio: DEEP project proposed to make the male to female ratio 55:45 by the end of the project. In all activities we were able to get increased female participation. DEEP achieved its target of male to female ratio in the two major support services, Technical Training (Male 56% and Female 44%) and disbursement of Small Grants (Male 53% and Female 47%), as given in the Tables 02 above and 3 below. Overall, Men and women were almost evenly represented, male 56% and female 44%.

Ethnic and Gender Composition of Beneficiaries: The project also expected to maintain the ethnic balance of the beneficiaries. The ethnic breakdown of the beneficiaries is given in Table 3 below. According to the table the percentage of gender ratio is 56% male and 44% female; ethnic ratio stands as given below: Tamils 60%, Muslims 19% and Sinhalese 21%.

Table 4: Gender and Ethnic Beneficiaries by District

District	DSD	Male	Female	Tamils	Muslims	Sinhalese
Batticaloa	Manmunai West	1,114	1,116	2,230	0	0
	Koralaipattu South	77	32	109	0	0
	Koralaipattu Central	147	128	0	275	0
	Koralaipattu	122	135	257	0	0
	Koralaipattu West	39	21	0	0	0
Trincomalee	Kinniya + Kantale	418	148	22	434	110
Polonnaruwa	Welikanda	576	363	57	68	814
	Total	2,493	1,943	2,653	859	924
	Percentage	56	44	60	19	21

Component One - Increase the quantity and quality of raw milk through targeted training and technical assistance

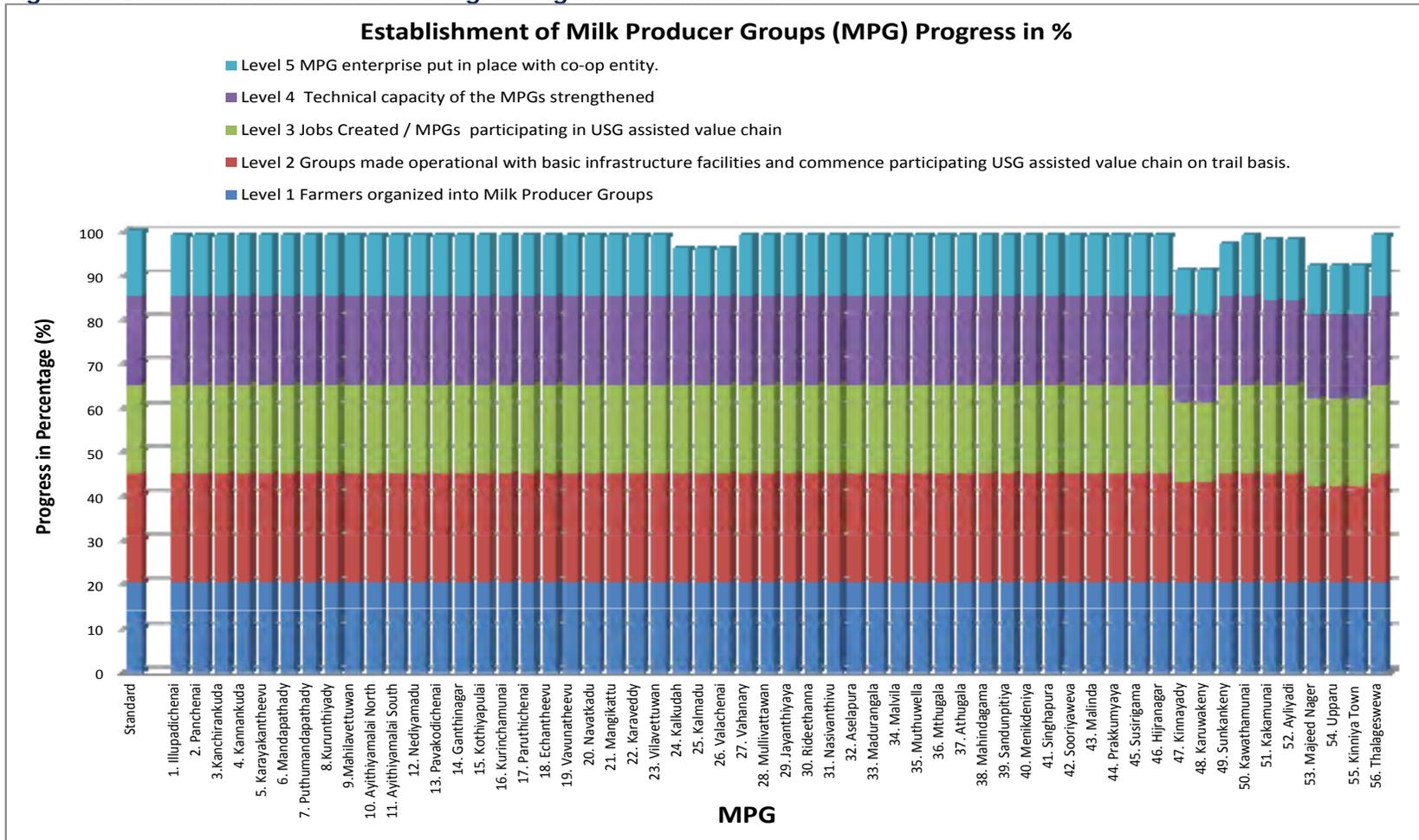
Indicator: Establish 40 Milk Producer Groups (MPGs) through reaching out to 4,000 farmers.

This indicator was one of the cornerstones of the project as it is instrumental in bringing the war affected people together so as to facilitate another major activity of the establishment of four MCCs. DEEP has exceeded this target by a total of 16 MPGs. MPG members benefitted from all other DEEP activities throughout the project.

As showed in Table 4, each MPG has been measured against the standard described in the key.

- At the completion of the project 56 Milk Producer Groups have been mobilized and organized into functional MPGs and all of them are functioning and supplying milk either to CIC, Nestle, Milco or to private collector milk collectors. 20 MPGs are supplying milk to Manmunai West MCC; 3 MPGs are supplying milk to the Mini Collection Centre at Ayithiyamalai; 4 MPGs are supplying milk to Kawathamunai MCC; 2 MPGs, Ritheethenna and Jayanthiyaya, that are located closer to the CIC Milk Processing Centre are supplying milk to CIC and 2 more still supplying to their previous buyers; 4 MPGs in Kalkuda are supplying milk to the nearby tourist hotels; 4 MPGs are supplying milk to Kinniya MCC; Thalgaswewa MPG in Kantale DSD is supplying milk to CIC; 16 MPGs are supplying milk to Muthuwella MCC.
- All 56 MPGs have reached some points in all 5 Levels and have started to function as Collective Action Group.
- A series of training programs were conducted on Good Cooperative Governance, milk quality testing, milk recording, entrepreneurship skills development, business planning, conflict sensitivity and gender sensitization for the management and the members of the MPGs/MCCs with a view to develop and strengthen them and their MPGs/MCCs. Representative from all 56 MPGs and four MCCs underwent these training programs. DEEP conducted 36 training sessions on Entrepreneurship Development and Business Planning as of March 2012.
- Other Training Programs: All 56 MPG officials or members were provided with the following training programs: Cooperative Good Governance, Gender Sensitivity and Conflict Sensitivity and Conflict Mitigation. A total number of 336 training sessions had been conducted for the MPGs on different subjects.

Figure 3: Establishment of MPGs - Progress against set milestones



Altogether 14 MPG buildings and 42 Mini Points have been constructed and additionally Ayithiyamalai MPG building was upgraded as mini MCC due to its increased daily milk collection.

The Final Project Review finding shows that the MPGs are well organized and its members are confident about continuing the management of them even after the phasing out of DEEP project. The finding and the comments made in this connection are given below:

Table 5: Management of MPGs

MPG Management	Frequency	%
1.Have a Committee and functioning	341	90.2
2.MPGs registered	305	80.7
3.Accounts/book keeping	303	80.2
4.Collective decisions	357	94.4
5.MPG self management after the Project	338	89.4

In almost all the MPGs, management was by a committee selected from among its' membership, and they adopted standard accounting procedures and had plans to manage the MPGs themselves even when DEEP phases out. The trainings provided on good governance and accounting procedures had helped MPG officials to maintain proper records of milk purchases and sales; which was evident in the field visits.

Indicator: Jobs created by USG-assisted enterprises at MPGs

- 56 MPGs have created a total number of 70 employment opportunities, 3 fulltime, 65 part-time and 2 temporary as given in the following table:

Table 6: Employment Creation by MPG

Type of Employment	Full Time	Part - Time	Temporary	Seasonal	Total	Male	Female	Sinhala	Tamil	Muslim
Total	03	65	02	0	70	25	45	24	40	06

(Data Source: DEEP Project Data)

- The part time employees will work approximately 2 hours in the morning. All of them are being paid by the MPGs by the revenue earned by selling milk.

Indicator: Dairy producers trained

DEEP formulated a Dairy Technical Training Program consisting of five following Modules: Animal Breeding and AI Administration, Feeding Management and Pasture Development, Clean Milk Production, Disease Control and Health Care and Dairy Management. The main objective of the training program was to increase the knowledge of the farmers on dairy farming techniques and to change their attitude and behavior. Attending this technical training was made mandatory for all DEEP beneficiaries. Demonstrations have been conducted as and when required. It is interesting to note that even non beneficiaries such as the large farm owners showed interest in participating in the training program. The trainees of these modules could be classified in to two groups as given below:

1. Those who have completed all five modules
2. Those who followed some or several modules and failed to complete all five modules

All those who completed all five modules and possessed the other required qualifications were entitled for cash grants.

Table 7: Completion of Five Modules

No	MPG	Male	Female	Total
1	Manmunai West	781	976	1757
2	Koralaipattu Central	149	124	273
3	Koralaipattu South	54	41	95
4	Koralaipattu	119	130	249
5	Koralaipattu West	39	21	60
6	Welikanda	409	234	643
7	Kinniya	354	102	456
8	Kantale	61	42	103
	TOTAL	1,966	1,670	3,636

Note: The total numbers that are given in Table 05 shows only those who have actually completed all five modules.

- This training program came to an end in November 2011 and as of this month a total number of 3,636 farmers, 1,966 (54%) males and 1,670 (46%) females have completed all 5 training modules as given in the Table 07 above. This table includes the cumulative total for the period from August 2009 to November 2011.
- Though 4,160 farmers enrolled into the training program by being in the 1st module, only 3,636 farmers were able to complete the whole package of 5 modules. Balance 524 farmers failed to attend one or two trainings due to their day to day life situations.

Table 8: Summary of Technical Training Program

Module	No Sessions	Male	Female	Total
Module 01: Animal Breeding and AI Administration	181	2,341	1,819	4,160
Module 02: Feeding Management and Pasture Development	150	1,927	1,624	3,551
Module 03: Clean Milk Production	140	1,937	1,611	3,548
Module 04: Health Care	137	1,985	1,606	3,591
Module 05: Dairy Management	150	1,949	1,636	3,585
Total	758			

(Data Source: DEEP Project Data - Note: This Table includes the 3,636 farmers given in the Table 5 above)

- As of November 2011, 758 Technical Training sessions had been conducted and 4,160 farmers, 2,341 (56%) males and 1,819 (44%) females had been enrolled into the training program on Module 1, Animal Breeding and AI Administration.

Pasture Development: The dairy farmers in the project area were ignorant of pasture development and feeding the cattle. Majority of the farmers depended on free grazing and allowed their animals to graze in the nearby and faraway jungles and sometimes lost the animals due to attacks by predators in the jungles. The Technical training stressed the need to move away from free grazing and concentrate on intensive or semi intensive farming system. They were told that one of the main activities towards semi intensive farming system is developing pasture land. As a follow up DEEP obtained grass cuttings from the MASL free of charge and distributed 361 grass cuttings to the farmers and requested them to cultivate and multiply and share them amongst themselves. As a result of this activity several farmers

started to develop plots to cultivate grass and some farmers have found selling grass as an attractive income generating activity.

Attitudinal & Behavioral Changes: Behavioral changes have been observed by the DEEP staff members and stakeholders amongst the farmers due to the continuous training programs, demonstration and field visits. Some of such changes are: increased interest shown to own one or two cross bred cows under the semi intensive farming system, increased demand for AI administration, increased interest for the construction of cow sheds, increased attention on immunization and the health of the cattle, growing Co 3 grass, feeding the cows with different animal feeds such as rice bran, poonac, mineral mixture etc.

The Midterm Evaluation that was commissioned by USAID highlights some of the behavioral changes that have taken place amongst the farmers and how this has contributed towards the increase of milk production: "Farmers also reported changes in herd size, production per cow, times milk is sold per week, and price per liter due to project interventions. As a result of the project, herd size has shifted to 1-5 cattle per herd. In some cases, farmers have reduced their total number of cows but have replaced low-yielding indigenous varieties with high-yielding improved varieties". Further the Final Project Review stated "Open grazing and paddocking of animals was the common form of management present among the dairy households earlier, but now it has slightly shifted to smallholder livestock farmers adopting semi-intensive management practices".

Beneficiary Ranking of Dairy Technical Training Program: According to the USAID Midterm Evaluation, the beneficiaries from all DSDs had responded positively towards the Dairy Technical Training program and this has received very high ranking amongst the all training programs as given in the Table below:

Table 9: Rating of training programs by DS division

DS Division	Very Bad	Bad	Average	Good	Very Good
Year 1					
Manmunai West	.7%	0%	1.4%	25.9%	71.9%
KoralaiPattu South	0%	0%	0%	28.6%	71.4%
KoralaiPattu Central	0%	0%	0%	26.7%	73.3%
Welikanda	3.4%	3.4%	0%	41.4%	51.7%
Year 2					
KoralaiPattu	0%	0%	0%	31.3%	68.8%
KoralaiPattu West	0%	0%	0%	0%	100.0%
Welikanda	0%	0%	0%	35.7%	64.3%

N=224

Source: Household Survey (USAID/VEGA Sponsored Midterm Evaluation)

Findings of the Final Project Review on Training stated: "About 75% of the beneficiaries have rated the trainings as good and useful to them for their livelihood activities. Most of the training programs were related to livestock management and financial aspects of a business activity. Training and technical assistance focused primarily on dairy technology, business planning & capacity building of farmer organization officials, Co operatives, Governance, financial management, milk testing, gender sensitivity, and conflict sensitivity.

Table 9: Final Review Respondents ratings of trainings

Respondent's Rating	Frequency	Percent
1.Neutral	2	0.5
2.Good	90	23.8
3.Very good	283	74.9

4.No answer	3	0.8
Total	378	100.0

Indicator: Increase in the production of milk per cow/day

It was a challenge to get quality data to process production increase of milk per cow/day because farmers find it difficult to fill up the record sheets due to the higher level of illiteracy and the poor management practices. DEEP faced budgetary constraints to hire educated youth to perform this function at village level.

However in 2010 DEEP appointed Community Based Monitors on a sampling basis and assigned the task of compiling the milk produced at the selected households. In April/May 2012 we hired a Statistician to do an analysis of these data together with an analysis of a sample primary data from 60 dairy farmers from 20 MPGs that operate within the Batticaloa district. This analysis has been titled "Analysis of Household Milk Collection Monitoring Data and Field Survey Data, 2011/12". Following observations were made by this analysis on Milk Production:

Increased Milk Yield:

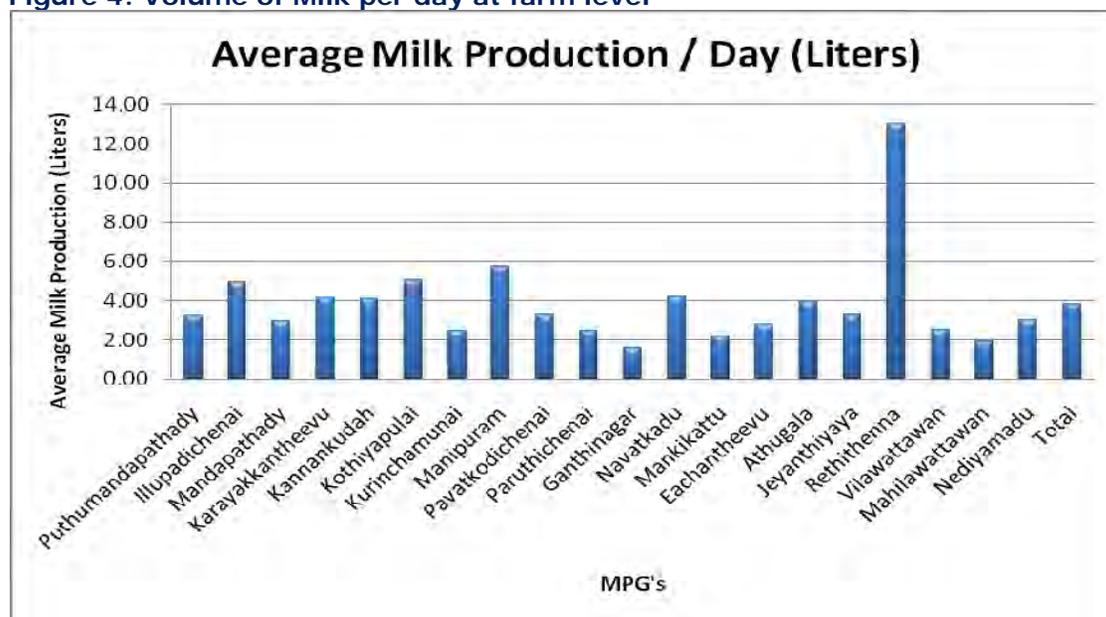
- This study found that the Average Milk Yield per day was 2.05 liters with the minimum of 0.74 liters and maximum of 6.25 liters per day per cow. According to the Base Line Survey, the average milk yield per day for indigenous/traditional cows was 2.077 liters and 0.718 liters per cow during the peak and lean periods respectively.
- In addition to this, Milco (GOSL owned dairy company) **Regional Manager for the Eastern Province** made an announcement to the press to the effect that the production of milk in the Batticaloa district has doubled in 2011 in comparison to the milk production in 2010. It should be stated that DEEP has played the leading role in the increase of milk production in the Batticaloa district during this period.
- **The Midterm Evaluation that was commissioned by USAID** through VEGA also supports the increase in milk yield in following terms: "Farmers also reported a slight average increase in yield per cow. A bigger variation is seen in the number of times per week that milk is sold. This indicates an overall increase in production. In qualitative responses, many farmers mentioned the benefits of being able to sell milk continuously and produce for their own consumption".

Volume of milk per day at Farm Level

Analysis of Analysis of Household Milk Collection Monitoring Data and Field Survey Data, 2011/12 also showed an increase of milk production at farm level too. The volume of milk produced per household per day showed noticeable variations among the MPG's studied, ranging from 1.62 liters/HH/day in Ganthinagar to 13.03 liters/HH/day in Ritheethenna. The overall average milk production was 3.84 liters per HH/day.

The same analysis pointed out that the number of milking days too has increase due to DEEP intervention. This analysis attributed the improved access to quality herds as the reason for the increased number of days in milking. The analysis showed that the average of milking days has increased to 280 milking days in a year. The milking days ranges from 178 days in a year (Kothiyapulai) to 351 Days (Karayakkantheevu).

Figure 4: Volume of Milk per day at farm level



- The Midterm Evaluation commissioned by USAID has to say this on increased milk production. “Farmers also reported a slight average increase in yield per cow. A bigger variation is seen in the number of times per week that milk is sold. This indicates an overall increase in production. In qualitative responses, many farmers mentioned the benefits of being able to sell milk continuously and produce for their own consumption”.

Table 10: Project-related change reported by farmers

Number of cows	Respondents in each category				Milk production (lt/week)		Times milk is sold per week		Price (Rs. per liter)	
	Before	After	Before	After	Before	After	Before	After	Before	After
0	20	9.3%	11	5.0%	0	0	0	0	0	0
1 – 5	123	57.2%	150	68.2%	1.66	2.63	4.07	5.06	22.78	36.89
6 – 10	42	19.5%	25	11.4%	2.51	3.28	4.63	5.88	21.31	41.04
11 – 20	17	7.9%	20	9.1%	4.47	4.69	6.35	5.44	22.06	38.00
21 – 50	6	2.8%	10	4.5%	9.00	3.20	7.20	8.10	18.00	47.10
51 – 100	6	2.8%	3	1.4%	1.25	21	5.50	7	26.75	51
	214		219		2.08	2.94	4.06	5.09	20.36	36.14

(Data Source: Midterm Review Commissioned by USAID)

The responses given by the cow owners within the 1 – 20 categories is relevant to DEEP as they came under the DEEP beneficiary category. Majority of the answers show the improvements that were made in the number of cows owned, milk production, number of times milk was sold and the increase in the milk price.

The following data given in the Final Project Review also proved that the production of milk at Household level has increased.

Volume of milk at the farm level

The volume of milk produced per household per day during the peak period showed marked variations among the DS divisions studied, ranging from 11.26 liters/HH/day in Kinniya (Trincomalee) to 40.8 liters/HH/day in KP South (Batticaloa). But the overall average milk production during the peak period was 14 liters/HH/day. But there were no significant changes in the volume of milk produced by households per day even after the project, although some level of increase can be seen.

Table 11: Milk production/household/day (Ltrs/day/HH)

DS division	Before	After
1. Manmunai West	11.51	13.3
2. Koralaipattu Central	13.47	15.4
3. Koralaipattu South	40.80	43.5
4. Kantalai	14.51	16.7
5. Kinniya	11.25	14.3
6. Welikanda	28.61	30.6
Mean	14.49	22.3

- MCC milk records also show collection of increased quantity of milk. DEEP closely observed the milk collection by Manmunai West MCC which commenced its milk collection with effect from March 2010; in 2010 their daily milk collection started with around 50 litres per day and peaked up to around 1,000 litres and fell down to 60 litres on the final day in December 2010. During the later part of in the months of November & November, 2010 their milk collection was affected by heavy rain and flooding. In the months of January and February 2011 also the entire project area was affected by devastating floods. But, Manmunai West MCC was able to collect around 2,000 litres of milk per day during the peak season. In May 2012 their daily average milk collection stood as given below: Manmunai West: 3,275 L, Kinniya: 2,809 L, Muthuwella: 2,533 L and Kawathamunai: 1,772 L. This could be attributed mainly due to change in farming practice and cattle management, wider coverage by the MCCs/MPGs and trust in the MPG/ MCC management.

Indicator: Milk collected from MPG/MCC meeting pre-established quality standards

- At MCCs, the milk collected carries an average of 3.9 fats and 9.0% average SNF. Milk fat and SNF were above the standard of 3.5% and 8.5%. Out of the total milk collected 90% is above or equal to quality standards.
- The employees of MPGs and MCCs were provided with testing equipment and trained in the use of the testing equipment. In addition to this, CIC too conducted testing milk quality at their collection point at Punani. Whenever they observe low quality they send their staff members to the respective collection point to find out the reason for it and take corrective action.
- CIC has appointed a Quality Testing Officer at the MW MCC to check and ensure the quality of milk and to support the MCC management to ensure quality maintenance at the MCC.
- The MPG buildings and Mini collection points give people an opportunity to deliver the milk faster to these collection centres and the MCCs are in a position to collect them and transport the milk to the Chilling Centres faster than earlier using the vehicles supplied by the project. MPGs have disciplined the farmers to bring the milk within a given period of time, before the truck leaves for the chilling centre.
- The midterm Review had this to say about quality and quantity improvement of milk after DEEP intervention "Since the project activities for improving quality and quantity of milk production cannot be separated, these two aspects were treated as inter-linked. Overall 92% of the respondents stated that project interventions have allowed them to improve quality and quantity of milk"

The major push factors that had helped dairy farmers improve their quantity and quality of milk produced were the trainings imparted to them (94.4% respondents) and equipments and grants provided (71%). Also connecting to service providers, being member of a MPG and

changed farm management techniques had provided a boost to increase production and quality of milk. Also training programs conducted by LOL - DEEP had a significant impact on improving quality and productivity of dairy farms.

Table 12: Approaches that helped in improving quality & quantity of milk produced

Approaches	Frequency	Percent
1. Training received	357	94.4
2. Grants / equipment received	267	70.6
3. Connecting to services	194	51.3
4. Being a part of an MPG	207	54.8
5. Having chilling plant close by	95	25.1
6. Change in farming practices	220	58.2
7. Larger farm/ Livestock	44	11.6
8. Better access to buyer	203	53.7
9. Changing Feed/grasses	69	18.3

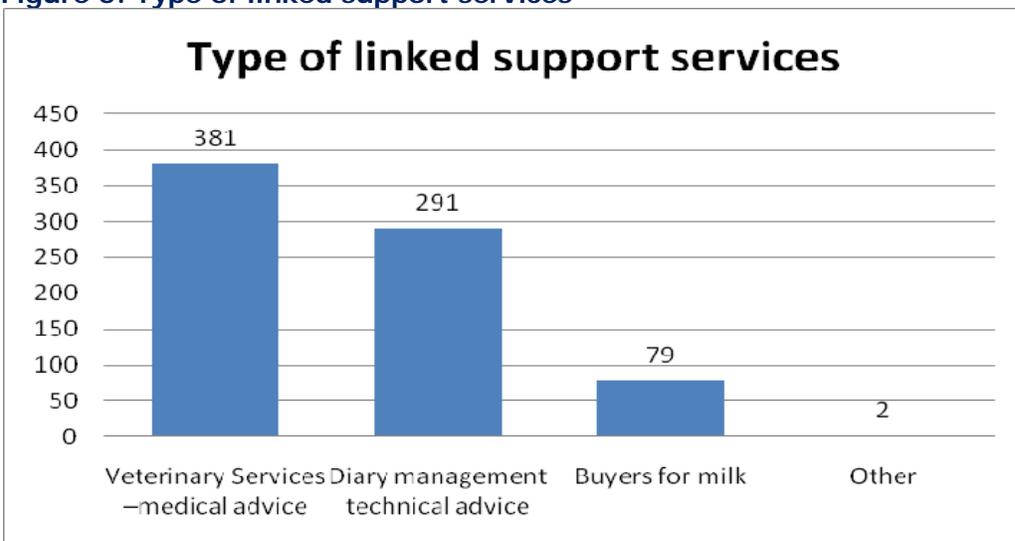
(Multiple responses for each category)

Indicator: Improve MPG linkages with Business Service Providers (BSPs)

Based on the Input Service GAP Analysis conducted, appropriate BSPs have been linked to all the MPGs.

- By the end of the project 56 MPGs have been linked to at least one BSP such as Hayley's Private Limited, Private AI technicians and DAPH, Financial service providers (banks and insurance companies), CIC Agri Businesses etc.
- Hayley's Private Limited is fully involved in conducting the 4th Module of the Dairy Technical Training on "Animal Health Care" with support from DEEP trainers and Mobilizers. They have established good linkages with the farmers through the MPGs. They also introduce items such as cattle feed, supplementary food packs and medicines during the training programs.
- Private AI technicians provide AI support, identify health issues and work as a bridge between the farmers and LDO of DAPH. DAPH provides extension services such as AI, training programs, disease identification and treatment, pregnancy diagnosis, assist in the confinement and support farmers in getting government assistance to develop the dairy sector.
- As the DEEP small grant is disbursed through Bank Accounts, almost all dairy farmers are compelled to open up personal bank accounts. The Batticaloa Peoples Bank has released LKR 6 million as dairy loans through the MWLBCS. SANASA Development Bank has agreed to release an amount of LKR 6.5 million to the Ritheethenna MPG and has released around 50% of the loans. National Development Bank has released LKR 01 million to Ritheethenna MPG. Navakraham, a micro finance institution has released LKR 3 million for the same MPG for the purchase of cows. By the end of the project period in May 2012 the Banks have released around LKR 20 million as loans to DEEP farmers for the development of dairy.
- Following comments were given in the Final Project Review regarding linkages: "About 91% of the respondents stated that they had been able to get linked with various support services through the DEEP project participation, to help them increase milk production. These services included veterinary services, dairy management advice and milk buyers."

Figure 5: Type of linked support services



Smallholder farmers benefiting from Small Grants Assistance

DEEP project provided an amount of LKR 20,000 (approximately US \$175/-) as small grant for each farmer who completed all 5 training modules in addition to the following conditions: membership in the cooperatives, possession of at least one milking cow and actively involved in dairy. Disbursement of grants were completed in March 2012. By the end of March 2012 DEEP has disbursed an amount of LKR 70,200,000.00 (US \$ 638,182.00) amongst 3,510 farmers. The farmers were expected to make their own contribution in the particular activity in which the grant money was invested. The estimated match contribution from the farmers stood as LKR 57,366,814.00 during the time of submitting the grant application; the actual Match Contribution from the beneficiaries was LKR 20,341,539.00. As a result of this farmer contribution stood at 29% of the total investment. This seems to be a satisfactory contribution and also shows that the disbursement of grants had mobilized a large amount of investment by the beneficiaries. The Table below gives further details on the beneficiaries and their activities.

Table 13: Details on cash grants

	Male	Female	Total	Tamils	Muslims	Sinhalese	Cow Purchase	Cattle Shed Renovation	Other
Total no of Farmers	1,872	1,638	3,510	2,137	889	484	2,842	651	17
%	53	47	100	61	14	25	81	19	0

- As shown in the Table 16 above, up to March 2012 grants were disbursed amongst 3,510 dairy farmers, 1,872 Males (53%) and 1,638 females (47%) for the following purposes: cattle purchase 2,842 (81%), cattle shed construction/improvement 651 (19 %) and for the purchase of water pump and for the cultivation of grass/fodder 17 (<1%).

Figure 6: Cash Grant disbursement by district

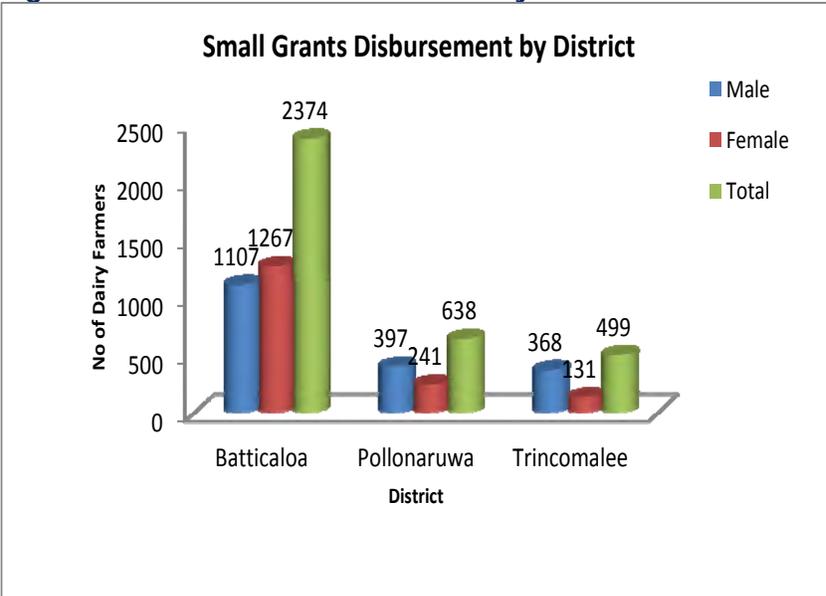


Figure 7: Cash grant disbursement by activity

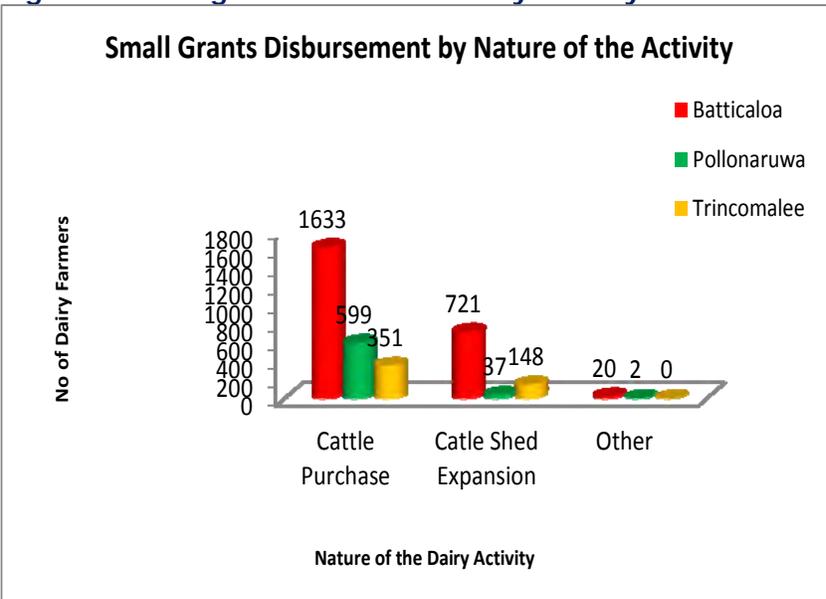
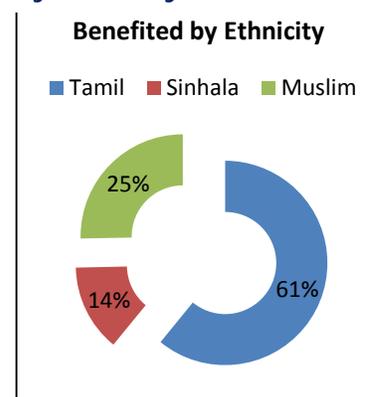


Figure 8: Beneficiaries by ethnicity

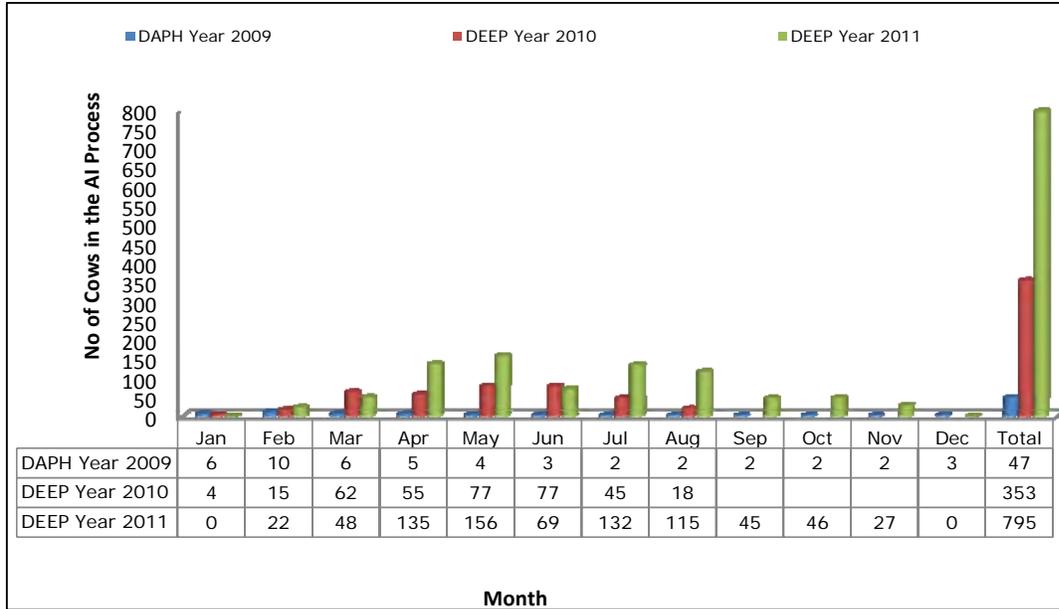


- All the grants disbursed were closely monitored by MPGs and Cooperative Societies. Land O'Lakes' staff members closely monitored the progress of the disbursed grants and followed it up for documentation and monitoring purposes.
- With the end of the grants disbursement in March 2012 the ethnic composition of beneficiaries stood as given below: Tamils 61%, Sinhalese 14% and Muslims 25%.

Artificial Insemination (AI)

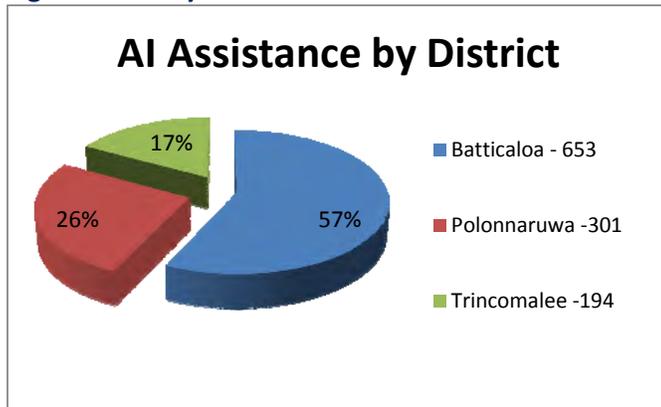
With the seasonal pattern of breeding, DEEP assisted the interested farmers on AI. The figure 9 below shows the AIs that were carried out by DAPH in 2009 and the number of AIs that were carried out by DEEP in 2010 and 2011. In 2010 DEEP has carried out AIs only in the Manmunai West DSD and in 2011 in addition to Manmunai West, AI had been extended to Welikanda and Kinniya. The progress of AI administration is given below:

Figure 9: Annual AI Administration



AI administration was completed in November 2011. The total number of AIs carried out in 2011 stood at 795. Within a two year period, 2010 & 2011 a total numbers of 1,148 AIs had been carried out in all three districts as given below: Batticaloa 653 (57%), Polonnaruwa 301 (26%) and Trincomalee 194 (17%).

Figure 10: AI by Districts



When we compare the AIs that had been carried out by the DAPH in 2009, DEEP has achieved great success and this achievement has led the DAPH to trust DEEP and extend its fullest cooperation for the implementation of DEEP. AI administration that was conducted under DEEP has raised the awareness of dairy farmers on AI and motivated them to seek this service from DAPH. The comment that was made in the Final project Review: “the DEEP project as one of

its' interventions in the dairy sector of the Eastern Province had conducted 1,148 AI administrations to the local cattle of farmers to improve the breed stock to enhance milk productivity of the animals. This had been one of the driving forces which helped in improving milk production per cow per day".

Component Two – Establish Milk Collection Centers (MCCs) and forge linkages with milk producer groups (MPGs)

This component aimed at building effective linkages between MPGs and the four MCCs that were built and equipped to create economies of scale in milk aggregation and to establish properly equipped and managed MCCs that will encourage and ensure the supply of quality milk to the market.

Indicator: Establish four Milk Collection Centers (MCCs)

At the end of the project DEEP had Constructed 4 MCC buildings and each MCC was provided with 2,500 liter milk chilling tank, Generator, testing equipment, office equipment and furniture and vehicles with a view to make them function effectively. 14 MPG buildings and 42 Mini Points also were constructed and grouped under the MCCs. Some MPGs and Mini Points opted to supply milk to other buyers such as Milco, Nestle and private individual buyers due to the old relationship and geographical proximity. Below are the groupings of MPGs and Mini points under each MCC:

Table 14: Groupings of MPGs and mini points under MCCs

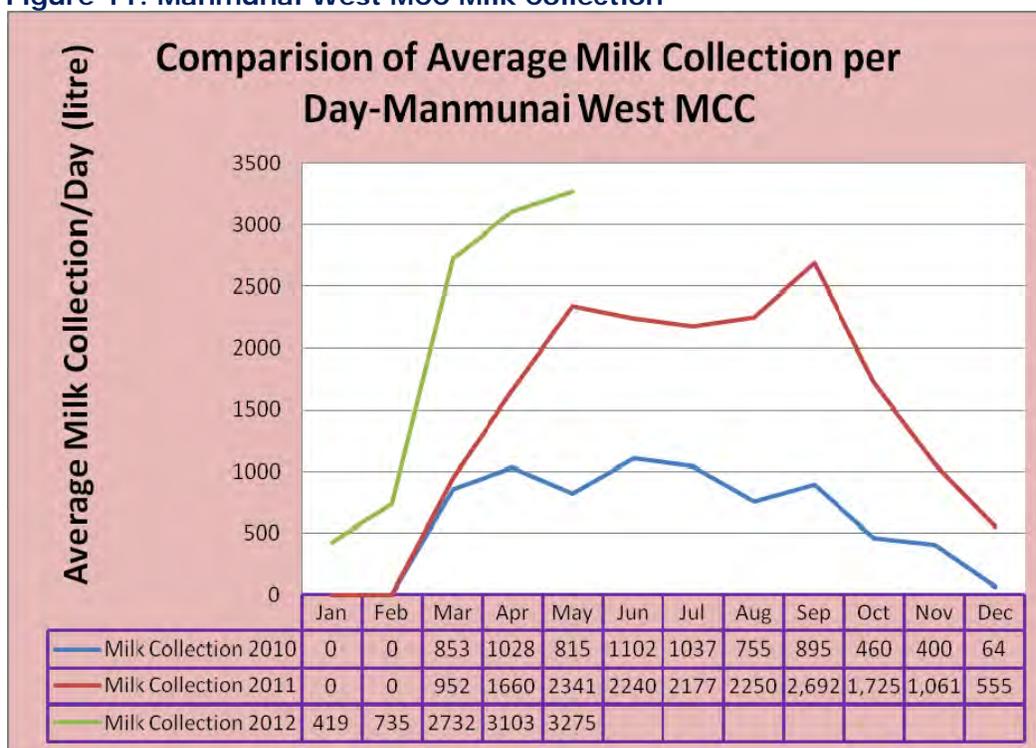
District	DSD	MCC	MPG	Mini Points
Batticaloa	Manmunai West	Manmunai West/Thandiyadi	Pavatkodichenai	Ootrumadu, Kannagi Nagar, Irunooru vill & Ganthi Nagar
			Panchenai	Kandiyanaru, Iduppanda Kulam & Kurunthayadi Munmari
			Navatkadu	Karavetti, Vila Vettuvan, Eachchan Thivu, Mangi Kattu, Vavunathivu & Puliyadi Munai
			Direct Supply to the MCC	Kannankuda, Karayakkan Thivu, Mandapaththadi, Iluppadihchenai & Paruththichchenai
			Ayithiya Malai Mini MCC	Katpanai, Mahila Vettuvan, Nediya madu & Ayithyamalai South
	Koralaipattu West	Kawaththamunai MCC	-	
	Koralaipattu South	Do	Vahanery	Mollivettuvan
	Koralaipattu	Do	-	Kinnayadi, Karuwakerny, Nasivan Thivu
	Koralaipattu	Direct Supply to Other Channels	-	Kalkudah, Valai Chenai & Sunkan Kerny
	Koralaipattu Central	Direct Supply to CIC	Ritheethenna	Omadiya Madu (Vaharai)
	Do	do	-	Jayanthiyaya
	Do	Kawaththmunai MCC	Hijrnagar	-

Trincomalee	Kinniya	Kinniya/Soorankal MCC	Upparu, Aiylayadi, Kakkamunai & Majeed Nagar	-
	Kantale	CIC & Other Channels	-	Thalgaswewa
Polonnaruwa	Welikanda	Muthuwella MCC	Muthugala, Athugala & Mathurangala	Malwila, Sandunpitiya, Sooriyawewa, Malinda, Muthugala, Perakumyaya & Susisrigama
			Mahindagama	Menikdeniya & Aselapura
Total	06	04	14	42

This has resulted in the increased milk collection by the MCCs and CIC. The MPG buildings and Mini Milk Collection Points are situated at far away villages and now farmers feel that they need not to travel to faraway places to deliver the milk. Some of them are in a position to walk either up to the MPG building or the Mini Points. The MCC vehicles travel to these collection points and collect the milk faster and bring it to the MCC. As DEEP commenced its collaboration with Manmunai West MCC at the initial stage, DEEP closely monitored its milk collection and other related activities. The increased milk collection by Manmunai MCC shows the effectiveness of the MPG buildings and Mini Points.

Milk Collection by Manmunai West MCC: While making improvements for the existing Manmunai West MCC, DEEP motivated the MCC officials to commence collection of milk. In March 2010 they commenced collection of milk with much reluctance. As the Manmunai West MCC was the first to collaborate with DEEP, its milk collection was continuously recorded. This MCC has become a good example for the achievements made by DEEP.

Figure 11: Manmunai West MCC Milk Collection



Source: MWLBCS Milk Collection Data

When we compare milk collection between 2010 and 2011, we can observe the increasing trend in the collection of milk. The figure above shows that in January and February this MCC's milk collection was zero. But in 2012 they were able to collect milk even in the months of January and February; in the months of April and May they have exceeded 3,000 Liters per day. They will be able to keep up this momentum up to the October 2012 provided that if any natural disaster doesn't strike the district.

DEEP's observation is that the following factors would have played a positive role in the increased milk collection at MW MCC:

1. The milk production per cow has been increased with the change in management practices as a result of the Training programs and demonstration.
2. The small grant support to increase on farm productivity has enabled the farmers to expand their dairy activity by having additional hybrid cow or changing the practice to semi intensive dairy farming with improved farm management.
3. Mobilization & establishment of MPGs and the installation of Mini Milk Collection centres has resulted in the collection of even half a litre of milk to the MPG/MCC.
4. Increased price and regular payment without strings attached also would have contributed to this situation.
5. Supply of vehicles resulted in the collection of milk from far away villages and quick transportation of milk to the MPG/MCC.
6. Training programs on Entrepreneurship Development and Business Planning has given a business orientation for the MCC officials.
7. Recruitment of full time staff members has created a team with commitment.

Milk Collection of Four MCCs:

Two new buildings were constructed for the Muthuwella and Kinniya MCCs; Muthuwella MCC commenced its operations in January 2012. Even before the construction of Kinniya MCC, they were involved in the collection of milk. Improvements were made to the Kawaththamunai MCC and they too were involved in the collection of milk before the official opening of the MCC. MW MCC was opened in 2010 and the other three MCCs were officially opened in the month of March 2012. The Table below gives the total quantity of milk collected by the four MCCs:

Table 15: Monthly milk collection and earnings of MCC Jan-May 2012

#	MCC	Jan'12	Feb'12	Mar'12	Apr'12	May'12	Total'12
1	MCC: MW/L	12,986	21,324	84,680	93,100	101,521	313,611
	LKR	647,792.00	1,071,902.00	4,234,050.00	5,027,400.00	5,754,107.00	16,735,251.00
2	MCC: Muthuwella/L	29,347	43,554	68,113	73,324	78,534	292,872
	LKR	1,502,490.00	2,756,617.00	3,480,300.00	3,739,524.00	3,608,400.00	15,087,331.00
3	MCC: Kawaththamunai/L	12,113	5,300	16,460	35,705	54,949	124,527
	LKR	605,560.00	270,300.00	823,000.00	1,856,660.00	2,909,440.00	6,464,960.00
4	MCC: Kinniya/L	15,478	17,610	38,145	62,615	87,084	220,932
	LKR	773,900.00	933,330.00	1,907,250.00	3,255,980.00	4,935,832.00	11,806,292.00

Source: MCC Milk Collection & Sales Data

According to the above table, all four MCCs had collected a daily average of milk and had earned a daily average of income as given below: MWLBCS: L 2091 & LKR 111,568; Muthuwella MCC: L 1,952 & LKR 100,582; Kinniya MCC: L 1,473 & LKR 78,708; Kawatthamunai MCC: L 838 & 44,000. These figures show that except for the Kawatthamunai MCC, all three MCCs are in the process of collecting an average of more than 1,500 L of milk. This shows that the MCCs have made a steady progress in the collection of milk.

All four MCCs had achieved some success in different areas. MWLBCS made an amount of LKR 350,000.00 as net profit and deposited this amount in a fixed deposit. Kawatthamunai MCC was able to settle its arrears electricity bill of around LKR 125,000.00 to the Ceylon Electricity Board within the first two months of operation. Muthuwella MCC collected LKR 450,000.00 during the formation of the Society and undertook the responsibility of getting the electricity connection to the MCC and used the remaining money as working capital. Kinniya MCC also undertook the responsibility of getting the electricity connection for the new MCC building. These examples show members commitment towards the Society and give them the sense of ownership for the MCCs.

Capacity Building/Institutional Strengthening of MCC/MPG

In addition to the training programs that were provided under Component one, following training programs were conducted for MCC staff members under Component Two: Milk Quality Testing, MCC Record Keeping, General Management, Input and Supply Management and Managing for Productivity. All these training programs had resulted in the improvement of knowledge and skills of MCC employees and contributed for the quality improvement of milk and increased the efficiency of the MCCs.

Farmer Perception of MCCs

The Final Project Review has measured farmer perception on the MCC and found them to be very positive. The following section from the FPR is reproduced below:

Table 16: Farmer Perception of MCCs

Ways MCC helps	Frequency	Percent
1. Better links to market	319	84.4
2. Better job opportunities	217	57.4
3. More efficient process	283	74.9

(Multiple responses)

Table 17: Use of MCCs

Advantages	Frequency	Percent
1. No wastage	161	47.1
2. No processing cost	11	3.2
3. Increased & reliable income	28	8.2
4. No wastage and no processing cost	5	1.5
5. No wastage and increased & reliable income	20	5.8
6. No wastage and any other	17	4.9
7. Any other benefits	100	29.3

Dairy farmer's perceptions on the advantages of the establishment of chilling centers in their villages were assessed. Many farmers (47%) viewed that they help in reducing wastage through milk spoilage. It was also expressed that chilling centers can help in securing a higher level of reliable income for them.

Milk processing center is seen by dairy farmers as an opportunity to increase their incomes, solve marketing problems and creates opportunities for some employment at the village level. Hence the establishment of milk chilling centers through DEEP project has been a tremendous benefit to dairy farmers of the project areas.

This was evident in the enthusiasm shown by MPGs and dairy farmers in helping to supply milk to the MCCs in their DS areas. This had helped MCC in increasing the volume of milk chilled and processed for further value addition”.

Summary of In Kind Grants:

Along with a series of training programs the MCCs, MPGs and Mini Points were supplied with necessary MPG/MCC buildings, Mini Milk Collection Points, furniture, vehicles, milk cans, chilling tanks, generators, weighing scales, testing equipment and all other necessary equipment that are needed for dairy business. The value of all these support is summarised below in financial terms in Table 11:

Table 18: Financial value of MPG/MCC Buildings & Equipment

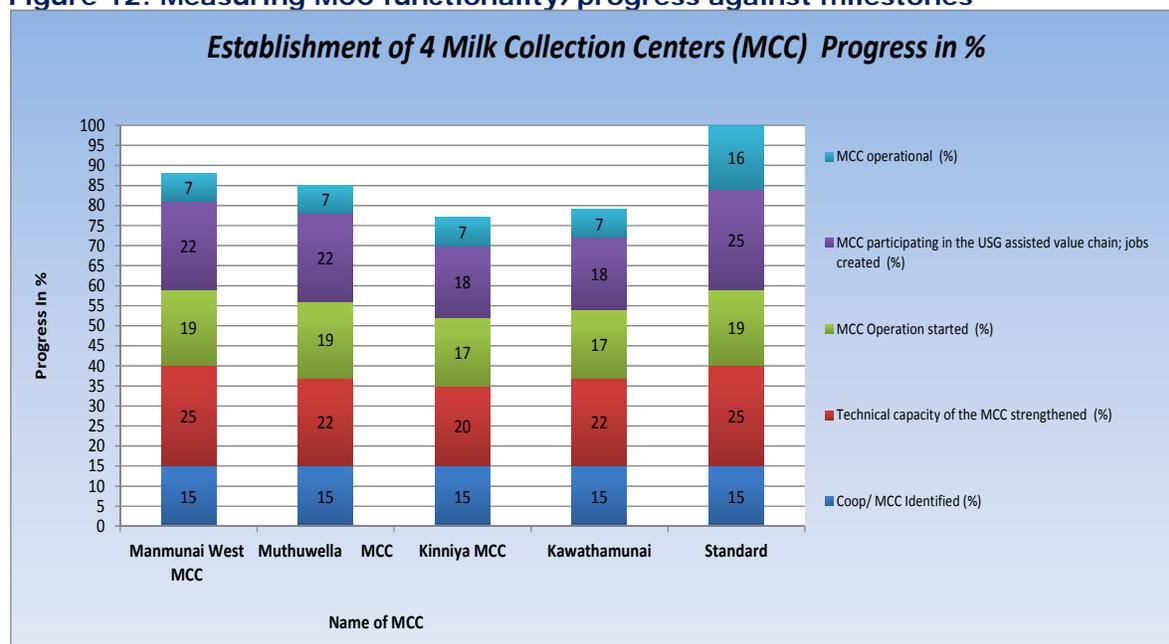
No	MCC/MPG	Value in LKR
01	Manmunai West MCC (Fed by 03 MPGs and 18 Mini Points) - Batticaloa District	11,827,794.00
02	Muthuwella MCC (Fed by 04 MPGs and 10 Mini Points) - Polonnaruwa District	9,968,576.00
03	Kawaththamunai MCC(Fed by 4 MPGs and 5 Mini Points) - Batticaloa District	4,931,673.00
04	Kinniya MCC(Fed by four MPGs) - Trincomalee District	4,552,045.00
05	Ayithyamalai	4,400,067.00
05	Ritheethenna MPG (Fed by one MPG and one Mini Point) - Batticaloa District	2,434,545.00
06	Rajawewa MPG (Fed by one Mini Point) - Trincomalee District	1,631,450.00
Total		39,746,150.00

All these support together with the technical training programs had strengthened the MCCs and MPGs and motivated them to get involved in dairy business with profit motive.

Functional Ranking of MCCs:

All four MCCs were ranked based on the set milestones for their functionality. All five criteria were allocated with points totalling up to 100. Different values were given for each criteria depending on the strength and the importance of the functions. Their functionality was measured on quarterly basis and they were awarded points according to their efficiency. Figure 5 below shows the efficiency levels of the four MCCs.

Figure 12: Measuring MCC functionality/progress against milestones



Level 1: Coop/MCC Identified (15%); **Level 2:** MCC Infrastructure development/improvement initiated (25%); **Level 3:** MCC operation started (19%); **Level 4:** MCC participating in the USG-assisted value chain; jobs created (25%); **Level 5:** MCC operational (16%).

According to the above figure, the first MCC to be established under DEEP, Manmunai West MCC, has been ranked first and the recently established new MCC, Muthuwella, ranks second. Even in the collection of milk and earning income these two had captured first and second places respectively. Kawaththamunai ranks third and Kinniya comes fourth in the ranking.

Indicator: Jobs created by USG-assisted enterprises at MCCs

As of May 2012, 16 full time jobs (15 male and 1 female) have been created in the four MCCs. Details of employment creation by MCCs are as follows: Manmunai West MCC: 6 males; Muthuwella MCC: 5 (01 female & 4 male); Kinniya MCC: 03 males; Kawaththamunai: 02 males. The wages for these employees are being paid by the Society. DEEP has provided on the job training for them.

Component Three – Establishment of Modern Dairy Processing Facilities

CIC was compelled to shift the establishment of this center to Dambulla due to the poor quality of water in the Batticaloa and Polonnaruwa districts and also due to the easy access to the market in the main cities.

Indicator: Establish modern dairy processing facilities in a PEER target province.

Originally DEEP proposed to establish the Milk Processing Plant in one of the PEER districts with capacity to process 20,000 L of milk per day. At the beginning CIC considered establishing this plant at Batticaloa. A Hydro Geological survey conducted by CIC showed the water quality was not of the standards that are required to process milk. In addition to this the high calcium and iron content in the water had the tendency to affect the machineries by way of corrosion. The same survey in Polonnaruwa too gave results that are similar to that of the Batticaloa findings. It would have been very difficult to find a water source with capacity to supply around 100,000 liters per day. Therefore, CIC discussed this matter with Land O'Lakes and proposed to shift the location to Dambulla which is situated in the Central Province at a central location with fast growing economy. Land O'Lakes discussed this proposal with USAID and with its consent Land O'Lakes submitted an amendment to the DEEP project proposal and obtained its approval to shift the location to Dambulla.

CIC has acquired a Bureau of Investment (BOI project land from the government and has paid an amount of LKR 25 million to a bank to which this land has been mortgaged by the previous investor and got the land released from the bank. Land O'Lakes provided the services of a Dairy Processing Engineer to facilitate the process of vendor selection and other related issues. With this support CIC chose "Scan Pro" a well reputed Sri Lankan Dairy engineering firm for the establishment of the plant. "Scan Pro" has submitted their proposals to CIC and did a presentation with the participation of officials from Scan Pro Denmark. After detailed discussions CIC has signed an agreement with scan Pro for the establishment of the Milk Processing Plant. At present CIC is involved in the renovation of the existing building on the land and has invested large amount of money for the importation of all necessary machineries. CIC management has promised DEEP to complete the establishment of the large processing plant in October 2012.

Due to the shift in the location DEEP did invest heavily in the milk processing site at Punani. Almost 300,000 USD was invested in this site under the DEEP program. The building was enhanced, and new equipment was built in order that more milk could be processed at their facility. CIC also developed two dairy farms in the project area; developed pasture land; and established a cattle feeding mill at Punani.

Indicator: Jobs created by USG-assisted enterprises - at CIC's Milk Processing Plant.

To date, 26 fulltime jobs and 6 temporary jobs have been created at the Punani milk processing center.

Indicator: Supply contracts/agreements signed between CIC and MCC.

CIC and MWLBCS have signed the first milk supply agreement of the project in 2011 and it is in force. CIC and Muthuwella MCC have signed supply agreement on January 25, 2012.

Three MPGs, Ritheethenna, Jayanthiyaya and Mollivettuvan, that are situated closer to the CIC milk processing Center are supplying milk directly to CIC without written agreements.

Although discussions were held between the Kinniya and Kawaththamunai MCCs on the signing of agreements, it was delayed due to a slow down of milk purchase by Nestle and the resultant over supply of milk in the market. Kawaththamunai MCC is supplying milk directly to CIC without an agreement. Thalgaswewa MPG in the Kantale DSD in the Trincomalee district too selling its milk to CIC.

Indicator: Value of milk purchases from smallholder dairy farmers

According to the available milk purchasing records, at the beginning CIC had been purchasing more milk from private suppliers and their milk purchase from DEEP farmers was lower than that of the private sector farmers. At the initial stage of the project DEEP farmers were not in a position to supply more milk. When the DEEP project gained momentum in the areas closer to the Punani Milk Processing Centre, Welikanda, Ritheethenna, Jayanthiyaya and Vahanery, the milk production had increased and CIC was able to purchase more milk from DEEP farmers. From January to May, 2012 CIC had purchased a total of 372,833 L of milk from DEEP farmers amounting to LKR 19,600,563.00; during the same period CIC had purchased 86,109 liters of milk amounting to LKR 4,579,059.00 from the non DEEP farmers. Overall, CIC had purchased 458,942 liters of milk from DEEP farmers and non DEEP farmers for an amount of LKR 24,179,622.00 during this period. Average price paid for this milk is around LKR 53.00.

CIC has been buying milk from MCCs of Manmunai West, Muthuwella, Kawaththamunai and MPGs from Ritheethenna, Jayanthiyaya, Vahanery (all from Batticaloa) and Thalgaswewa (Kantale). An infusion of LKR 24 million within five months period directly in to the farming community means an inflow of large amount of money and when the farmers invest this money to improve their livelihoods should bring in rapid development to these poor and resource starved villages.

Indicator: Marketing Strategy

A marketing strategy has been developed for the products manufactured at Punani Processing Centre. The major marketing strategy also had been completed and CIC is making large investments in the sector based on them.

The mini milk processing at Punani commenced its operation in 2009 and processed around 300 liters of milk. They gradually increased the quantity of milk processed per day and decided to expand the processing capacity of this plant to 5,000 L of milk per day. They sought the support of DEEP to achieve this. DEEP has provided LKR 36 million for the improvement of the buildings and to replace machineries and equipment to increase its processing capacity. At present Punani plant is processing around 4,800 liters of milk per day and producing 45,000 cups of yogurt. The presence of this plant gives another economic opportunity for the poverty stricken farmers who live in the surrounding areas and assures a firm market for their milk. In turn CIC too has a firm demand for their yogurt and it is being marketed by the leading Super Markets in Sri Lanka.

Project	Dairy Enhancement in Eastern Province
Code	CA #383-A-00-09-00505-00

Current Quarter	Current Quarter	Progress Years	Year 1+2+3
Start	1-Apr-12	Year Start	1-Jun-09
End	31-May-12	Year End	31-May-12

	Performance Indicator (*)	Unit of Measure	Disaggregation	Baseline Target	Baseline Value	Quarterly Target	Quarterly Progress	Annual Target	Annual Progress	Frequency of reporting	Remark
SO	Dairy Enhancement in Eastern Province (DEEP)										
a	Increase in Dairy-related annual income	%	Total	60%	Rs. 8,163.54			25%	73%	Annual	In comparison to the baseline, the average price per liter of milk has increased to Rs. 51.00, it is 73% and remaining as last quarter
b	Smallholder dairy farmers benefiting	Farmers #	Male	4000		0	0	0	2493	Annual	2,493 (56%) total male benefited (Total 4,436)
			Female	M- 2,200 F- 1,800	0	0	0	1943	1,943(44%) total females benefited (Total 4,436)		
Component One: Increase the Quantity and Quality of Raw Milk through Targeted Training and TA											
1	Microenterprises participating in USG assisted value chains (Milk Producer Groups (MPG) established)	MPG #	Total	40	0	0	0	40	56	Quarter	To date, 56 Milk Producer Groups have been mobilized and organized into functional MPGs. Out of this; 56 MPGs are operational and have started to collect milk. 17 MPGs are supplying milk to Manmunai West MCC; 3 MPGs are supplying milk to the Collection Centre at Ayithiyamalai; 3 MPGs are supplying milk to Kawathamunai MCC; 4 MPGs are supplying milk to Kinniya MCC; 14 MPGs are supplying milk to Muthuwela MCC; 2 MPGs that are located close to the CIC Milk Processing Centre are supplying milk to CIC and two more still with their earlier buyers.

2	Jobs created by USG assisted enterprises	Jobs #	Male				3		25	Quarter	56 MPGs have offered 3 fulltime jobs, 65 part-time and 2 temporary employment opportunities for 45 females and 25 males at the MPGs. The people who hold part time positions will work approximately 2 hours in the morning and they are being paid by the MPGs.
			Female	40	0	0	3	40	45		
3	Dairy producers trained	Farmers #	Male	4000 M- 2,200 F- 1,800	0	0	0	3000 M-1650 F- 1350	2341	Quarter	To date, 758 Technical Training sessions have been conducted and 4,160 farmers, 2,341 (56%) males and 1,819 (44%) females were trained.
			Female				0		1819		
4	Increase in productivity of milk per cow/day	lit/cow/dat %	Total	25%	0%		25%	10%	25%	Semi Annual	
5	Milk collected from MPG/ MCCs meeting preestablished quality standards	%	Total	90%	0%	10%	0	50%	90%	Quarter	MCCs, the milk collected carries an average of 3.9 fats and 9.0% average SNF. Milk fat and SNF were above the standard of 3.5% and 8.5%. Out of the total milk collected 90% is above or equal to quality standards.
6	Improved MPG linkages to business service providers	#	Total	40	0	0	0	30	56	Quarter	To date, 56 MPGs have been linked to at least one BSP such as Hayley's Private Limited, Private AI technicians and DAPH, Financial service providers (banks and insurance companies), CIC Agri Businesses etc.
Component Two: Establish Milk Collection Centers and Forge Linkages with Milk Producer Groups (MPGs)											
7	Microenterprises participating in USG assisted value chains (Milk Collection Centers (MCC)established)	MCC #	Total	4	0	0	0	4	4	Quarter	4 MCCs were supported by the project. One at Manmunai West, Batticaloa District managed by MWLBCS and Kawathamunai Dairy Coopertaive Society. Another at Muthuwella, Pollonaruwa District managed by Muthuweli Dairy Farmer Society and Kinniya, Trincomalee District managed by Kinniya Dairy Coopertaive Society

8	Jobs created by USG assisted enterprises	Jobs #	Male				5		14	Quarter	To date, 15 full time jobs were created in the MCCs at Manmunai West, Kinniya and Muthuwella. Manmunai West MCC has created 6 jobs and Muthuwella MCC has created 5 jobs. Muthuwella and Kinniya Cooperatives have created 2 jobs (GM & driver) each. The wages for these employees are being paid by the Society. DEEP provided on the job training for them.
			Female	20	0	5	1	20	1		
Component Three: Establish Modern Dairy Processing Facilities in a PEER Target Province											
9	Microenterprises participating in USG assisted value chain (processing equipment)	Equipments #	Total	1	0	0	0	1	1	Annual	CIC Agribusinesses had established a Mini Milk Processing plant at Punani with a capacity to process 5,000 liters of milk per day. The CIC Punani Processing Center was assisted with grant funding and technical assistance. In addition, the larger Milk Processing Plant will be established in Dambulla and work related to this is underway.
10	Jobs created by USG assisted enterprises	Jobs #	Male	50	0	0	0	40	33	Quarter	To date, 43 employment opportunities have been created and 33 males and 10 females have been working at the Punani Plant.
			Female				0		10		
11	Supply contracts/agreements between CIC and MCC	Contracts/Agreement #	Total	4	0	4	1	4	2	Quarter	The first sales agreement was signed between the CIC and MWLBCS in January 2010 and they have been supplying milk to CIC continuously. The second agreement was signed between CIC and Muthuwella MCC on January 25, 2012. All arrangements were made to sign the other two agreements with Kawaththamunai and Kinniya MCCs. This was delayed by CIC due to oversupply of milk in the market. They will sign agreements when the Dambulla plant opens.

12	Value of milk purchases from smallholder dairy farmers per Quarter	\$	Total	\$521,053	\$0	\$260,526	\$ 82,355	\$1,563,159	\$ 277,053	Quarter	At present CIC has been purchasing milk from Welikanda, Manumunai West, Koralaipattu Central and Kantale areas. From 2010 to date, the value of milk purchased from the MCCs and MPGs was Rs. 58,778,172 (US\$ 470,225).
13	Marketing Strategy	Plan #	Total	1	0			1	1	Annual	CIC has completed two Marketing Strategies one Punani Plant and Dambulla Plant, for the production of yogurt. CIC has already commenced production of yogurt and increased the processing capacity to produce 50,000 cups of yogurt per day. Dambulla plant has been constructed based on the estimates in the particular Marketing Strategy.

PROJECT COORDINATION

Throughout the project period DEEP had been coordinating with several private and state sector partners to make the project a success. This coordination and partnership with the alliance partners, stakeholders, and the MPGs with significant activities continued till the end of the project and contributed for the successful implementation of the project. It is expected that the linkages that were established with these institutions will be continued even after the completion of the project. This coordination has been described under two headings, Private Sector Partners and State Sector Partners.

Private Sector Partners

Coordination with Alliance Partner CIC Agri Businesses: Main purpose of PAP is to bring in private sector companies to get involved in the development of the country and to contribute to the growth of the economy and eradicate poverty. Although CIC Agribusinesses had limited experience in dairy processing, Land O'Lakes selected CIC Agribusinesses due to its financial strength, enthusiasm shown by the management and its professional approach in its business. As agreed, CIC cooperated fully during the life of the project and kept up to its commitment to establish a Milk Processing Plant with capacity to process 20,000 L of milk per day. They also developed two abandoned farms, Muthugala and Punani, and established a dairy processing centre, a cattle feeding mill, a breeder farm and developed the pasture land in Punani; they also purchased milk with higher price as agreed in the MOU. The staff members from both organizations worked together in providing training and much needed advice for dairy farmers. In turn DEEP supplied them with two milk Bowsers and supported to expand the capacity of the Punani processing plant to process 5,000 L of milk per day. Land O'Lakes also provided the much needed consultancy services for the MPP at Punani and for the Dambulla MPP.

Hayley's Ltd.: Hayleys is one of the leading private sector companies in Sri Lanka and it is involved in diverse economic activities. It is one of leading marketers of pharmaceutical products for livestock and pet animals. Therefore, DEEP had discussion with its Eastern Sales Executive to explore the possibility of obtaining their services to introduce and exhibit the pharmaceuticals and nutritious food product that were marketed by their company during the training program. He willingly agreed to do so and also agreed to facilitate the Dairy Technical Module on "Animal Health and Disease Control". Due to this collaboration DEEP was able to introduce lot of dairy related pharmaceutical and food items to the farmers in the remote villages of the project area. Later on, several of DEEP farmers were selected as agents to market their products in the respective villages. This helped some enterprising farmers to earn an extra income. In some cases they even supplied the products to the MCCs and MPGs on credit basis.

Nestle' Ltd.: As one of the leading milk buyers in Sri Lanka, DEEP maintained a friendly relationship with Nestle and other milk buyers such as Milco. At the initial stage of the project when DEEP motivated the Manmunai West MCC to get involved in the collection of milk, we didn't expect milk collection to exceed 1,000 L mark per day within a short period. When the milk collection started to increase, Manmunai West officials asked for DEEP support to market the large quantity of milk at a reasonable price. At this time CIC was not in a position to procure a large quantity of milk as they had been processing only 300 liters per day. DEEP approached Nestle' for support. They willingly agreed and supplied the MCC with a 2,000 L chilling tank and commenced purchasing milk from Manmunai West MCC. This relationship continues even today. At present this MCC is selling milk to Nestle and CIC. Nestle has been involved in procuring milk from Kawatthamunai and Kinniya MCCS too. When Nestle decided to reduce its milk purchase locally and took first step in the month of April 2012, in some parts of Sri Lanka the dairy farmers started throwing their excess milk on the road to attract GOSL attention. Fortunately, Nestle' continuously bought milk from MCCs supported by DEEP.

SANASA Development Bank: This bank originated from a micro credit group and became one of the leading commercial banks that showed interest to give loans to farmers and the poorer section of the community. This bank was introduced to the farmers during the Workshop that was organized to discuss linkages with financial institutions under the "GAP Analysis". This bank showed more interest in reaching out to the dairy farmers and support them financially. At present this bank has committed LKR 5 million for Ritheethenna MPG and had released loans for 30 farmers at the rate of LKR 50,000 per farmer. They have made initial contact with other DEEP farmers too.

National Development Bank (NDB): This private sector bank is collaborating with CIC in the development of dairy farming in the Mahaweli areas. They have already released an amount of LKR 2.25 million at the rate of LKR 50,000.00 for each dairy farmer. This will be expanded based on the success of the repayment of loans. This bank is supporting CIC to make the payment for the milk every three days instead of making the payment fortnightly. The bank has appointed representatives in the remote villages and the farmers are in a position to withdraw money from them.

Public Sector Partners

As the subject of Livestock Development is being handled by more than one ministry and several government institutions, it should be handled carefully without harming the relationship with all of them. At the field level there are institutions that represent the Central Government and the Eastern Provincial Council. DEEP had to do a tight rope walking with all of them to implement the project without any obstacles.

Ministry of Economic Development (MOED): When the DEEP project was awarded to Land O'Lakes, it was dealing with the Ministry of Nation Building which was assigned with the donor funded projects and regional development. Therefore, DEEP was dealing with this ministry to sign the MOU. During the second half of 2009 Sri Lanka faced several elections and underwent several political changes. As a result of this the Cabinet of Ministers was restructured and the subjects that were handled by the Ministry of Nation Building were given to the newly formed Ministry of Economic Development. In September, 2009 DEEP signed the MOU with them. We received the fullest cooperation from this ministry in getting the VAT exemption letter approval faster from the Department of Fiscal policy of the Ministry of Finance and got it extended once for a further period of six months. They have supported us in several ways whenever we were in need of the services of other GOSL institutions. They have supported our applications for work visa in Sri Lanka for expatriate staff members and coordinated our work with the Ministry of Livestock Development and other relevant ministries.

District Secretaries and Related Officials: District Secretaries are the central governmental representatives based in the district. It is very important to obtain their approval to implement any projects in the district. DEEP officials met with the District Secretaries from Batticaloa and Trincomalee and kept them informed about the project and got their advice on this matter. The District Secretary for Batticaloa called all the relevant stakeholders in the district and facilitated the process of implementation. It was possible for us to obtain the much needed support of the Divisional Secretaries whose support is crucial in implementing projects at grass root level as his secretariat has officials representing majority of GOSL administrative machineries.

The Mahaweli Authority of Sri Lanka (MASL): MASL is an institution that was specifically created by law to manage the civil affairs of the people who were settled under the Mahaweli Development project. While working in the Welikanda DSD and in the Koralaipattu Central DSD, DEEP officials realized the importance of MASL and had developed cordial relationship with them. As MASL has authority to allocate lands in these areas, DEEP farmers were able to get blocs of land from them for the construction of MPGs, MCCs and Mini Points. They also agreed to allocate land for pasture development too. The value of land allocated by them was estimated to be around LKR 8 million. As MASL also was involved in the implementation of livestock development activities, their support to the farmers became complementary and DEEP saw rapid development of livestock in the Mahaweli Areas. MASL also supplied DEEP with CO 3

grass cutting free of charge and these grass cuttings were distributed amongst the Batticaloa dairy farmers.

Provincial Ministry of Agriculture: As the Livestock Development is a devolved subject, the authority to deal with the subject matter is coming under the purview of this ministry. The Secretary and the Director of Planning of the ministry took a keen interest in facilitating the implementation of DEEP in the Batticaloa and Trincomalee districts. As they were in a position to coordinate with the other relevant departments in the province, it became much easier for DEEP to obtain the support of other governmental institutions in the province.

Provincial Director for the Department of Animal Production and Health (DAPH): This subject is devolved to the Provincial Councils and at district level we had to deal with the District Veterinary Surgeon who is the district head of the DAPH. As they have veterinary surgeons and Livestock Development Officers at the DSD level, their cooperation is crucial for the implementation of the project. We received the fullest cooperation of these officials in all three districts, Batticaloa, Trincomalee and Polonnaruwa. They supported DEEP to conduct the Dairy Technical Training program and shared with much needed information and data on livestock development. They extended their fullest cooperation in conducting the AI administration and agreed to continue this work after DEEP phase out.

Provincial Commissioner for Cooperative Development: DEEP needed the support of this Department as it had to register the Livestock Development Cooperatives with it. Under his/her guidance the ACCD extended her fullest cooperation in solving the problems that were faced by DEEP farmers in the registration process and they also showed interest in channeling the GOSL resources to the Cooperatives that were formed by DEEP. They provided the much needed advisory services to the farmers in matters pertaining to the Cooperatives. We received the support of the ACCDs in all three districts.

Assistant Commissioner for Agrarian Services: DEEP obtained the services of this official in the Batticaloa district as some farmer communities preferred to get registered as Farmer Organizations under this institution. The Development Officers who came under his purview supported DEEP to implement the project within the Batticaloa district.

Milco: This GOSL institution comes under the Department of Livestock Development and regarded as the milk collection and dairy processing arm of the GOSL. At the initial stage of the project DEEP had discussions with its Eastern Regional Manager and discussed as to how to avoid conflict during the implementation phase. The Regional Manager provided us with the vital information on the underserved dairy villages and supported our effort in the province.

Bank of Ceylon: Bank of Ceylon is a state owned largest commercial bank in Sri Lanka. This bank has good experience in disbursing GOSL agricultural loans to paddy farmers. GOSL has used this bank in the implementation of several other development loans at grassroots level. When we decided to disburse cash grants in the Manmunai West DSD in Batticaloa the Cooperative Federation expressed its concern on such large amount of money being credited to their account and told us that they don't have the managerial skills and necessary human resources to handle such amount of money and also pointed out that sometimes there is a legal strangle involved in this regard. They agreed to monitor the usage of grants and work with DEEP in the disbursement of them. DEEP approached the Batticaloa Bank of Ceylon Manager to support the disbursement of grants to individual farmers. He agreed to release the money only on a letter issued by DEEP Chief of Party. This helped a lot in the smooth implementation of large amount of grants. The Bank of Ceylon in Batticaloa has agreed to consider the members of the Manmunai West MCC in the future dairy credit facilities that are sponsored by the GOSL. This Bank has released an amount of LKR 6 million as loans for MWLBCS members on the recommendation of the federation.

People's Bank: People's bank is another state Bank with widespread branches in the rural areas of the country. Some of our farmers maintain their personal bank accounts with this state bank as well. This bank has released LKR 6 million as group loan to the Manmunai West

MCC to be disbursed as loan for its members. The MCC has taken up the responsibility of repaying the loan installment from members' milk money.

National Savings Bank: This is the largest Savings Bank in Sri Lanka and owned by the state. While disbursing the cash grants to Manmunai West, some beneficiaries complained that they are not in a position to open personal bank accounts with the Bank of Ceylon as their minimum amount to open accounts with them is LKR 1,000.00. DEEP approached the NSB for support. They said that their minimum amount to open personal savings account is LKR 100.00 and they also visited the remote villages and opened bank accounts on the spot. The Manager agreed to release the money on the letter issued by the COP. This collaboration with the NSB had given an opportunity for several beneficiaries who had never dealt with a bank and also given them an opportunity to open bank accounts in their names.

NGO Cooperation:

Navakraham: This micro credit institution had shown interest in working with DEEP farmers and as an initial step they have released an amount of LKR 3 million for Rittheethenna MPG.

Sewalanka: On the request made by Sewalanka, a leading national NGO, DEEP conducted training sessions on Dairy Technical Training for their dairy farmers in Batticaloa.

DAI: On a request made by Dai, a USAID consultant, DEEP conducted Dairy Technical Training program for their farmers in Omadiyamadu, Vaharai DSD, Batticaloa.

Sustainability

Definition of Sustainability: DEEP's definition for Sustainability: "Communities' ongoing capacity and resolve to work together to establish and advance and maintain effective strategies that continuously improve milk production in terms of quality and quantity and improve their bargaining power with a view to increase their income and make profit and reinvest the profit for the improvement of their Cooperative Societies which will result in the improved standard of living condition for cooperative members."

DEEP and Sustainability: Since the inception, Land O'Lakes was concerned with the sustainability of the achievements once the project closes. The factors that would ensure the sustainability of the project were inbuilt in the project with its strategy. In addition to the strategy, the following factors were given emphasis in the implementation of the project:

People's Participation: The concept of Social Mobilization was mainly based on people's participation from its inception. DEEP Mobilizers explained the farmers about DEEP project objective, emphasizing the message of farmers' voluntary participation. Their contribution would be the ultimate factor that will result in the implementation of the project in their respective villages. The continuous technical, business and entrepreneurship training programs made many groups come forward and ensure the successful implementation of the project. People's participation can be seen in the small grant investment and collection of milk, where Land O'Lakes requires each farmer to give time or labor. This participatory element has instilled a feeling of ownership in the project and this will help to ensure the sustainability of the project after phase out by Land O' Lakes.

Democratic Cooperative Principles and Inclusiveness: The MPGs and all other participating Farmer Organizations were given an orientation in the nine Cooperative Principles that are highly connected with the Democratic Principles and had resulted in the inclusion of the small farmer as an important member. One eminent dairy expert said that "I am so surprised to see the collection of even .5 L of milk from dairy farmers and the way they are being connected to the National Dairy Value Chain in keeping with DEEP's main objective". This inclusion of small and large scale milk producers gives all farmers the opportunity to participate

in the process of the election of office bearers, decision making, management of milk collection points etc.

Empowerment: This concept too was ensured from the inception of the project by motivating the Societies to take responsibility to make decisions and negotiate with the main stakeholders such as the GOSL institutions, DAPH, DSD, ACCD, ACAD, Provincial Authorities, MASL etc. and the private sector companies such as CIC, Hayley's Ltd. and other breeder farms and service providers. Land O'Lakes took the responsibility of facilitating the process of empowerment and showed them the way. As a result of this, the dairy farmer groups were able to negotiate with the GOSL authorities and obtain land for the construction of buildings and pasture land. Manmunai West LBCS was able to negotiate a favorable agreement with CIC due to this process. Some MPGs have successfully negotiated to obtain loans with several banks for the purchase of high milk yielding cows to improve their business.

Institutional Sustainability: The Milk Producer Groups that were formed were grouped in to an apex body called Dairy/Livestock Breeders' Cooperative Society/Federation. A few MPGs have been registered as Farmer Organizations with the Assistant Commissioner for Agrarian Services. Even they supply their milk to the MCCs that are managed by this federation. Therefore, at grass root level they all are linked to each other and function under the Cooperative and Agrarian Laws of the country. As they come under the purview of the GOSL officials, their accounts will be audited by them and also these institutions are well placed to get further GOSL support for the dairy sector.

Capacity Building:

Ownership and Decision Making- In addition to the USAID contribution, the farmer groups have made their own contribution in the form of obtaining land for construction of buildings and the members have made financial contribution towards the working capital and to obtain electricity connection for the MCCs. This factor gives them ownership for the MPGs and MCCs. All office bearers were trained in the Cooperative Principles and applying them in the management of the MPGs and MCCs.

Human Resources -These entities will be audited and supervised by the respective GOSL officials. All these entities were provided with the above mentioned training and well prepared to manage their MPG milk collection points and the feeder Mini Milk Collection Points. The officials and employees of the MPGs and MCCs were given training in maintaining accounting and financial records and in testing milk to ensure the quality of milk by Land O'Lakes and CIC Agribusinesses. Towards the end of the project they have proved their ability to improve the quality of milk by meeting the higher quality standard set by CIC. Therefore, they are in a position to sustain the organizational structure that was revived after the war.

Linkages- have taken place in two fold, GOSL linkage and linkages with private sector stakeholders and service providers.

Linkages with GOSL: All MCCs have been registered with the Assistant Commissioner of Cooperatives Development and they come under the supervision of Cooperative Development Officer who is based at the Divisional Secretariat office. If they are registered as a Farmer Organization with the Assistant commissioner for Agrarian Services, they will be supervised by the Development Officer who is based at the Agrarian Service Office in the area.

Linkage with DAPH: Department of Animal Production and Health is another important GOSL institution that provides several major services to the dairy farmers. DEEP has improved the relationship between the divisional Veterinary Surgeon and Livestock Development Officers. DEEP also persuaded these officials to provide their hand phone numbers to the farmers so as to get advice from them in on emergencies, sickness of animals and pregnancy related advice.

Linkages with Private Sector: Primary linkage between the MCCs and CIC Agribusinesses has been established through an agreement to purchase milk at the price one rupee higher than that of any other buyers. This agreement assures the farmers supply of cattle feed,

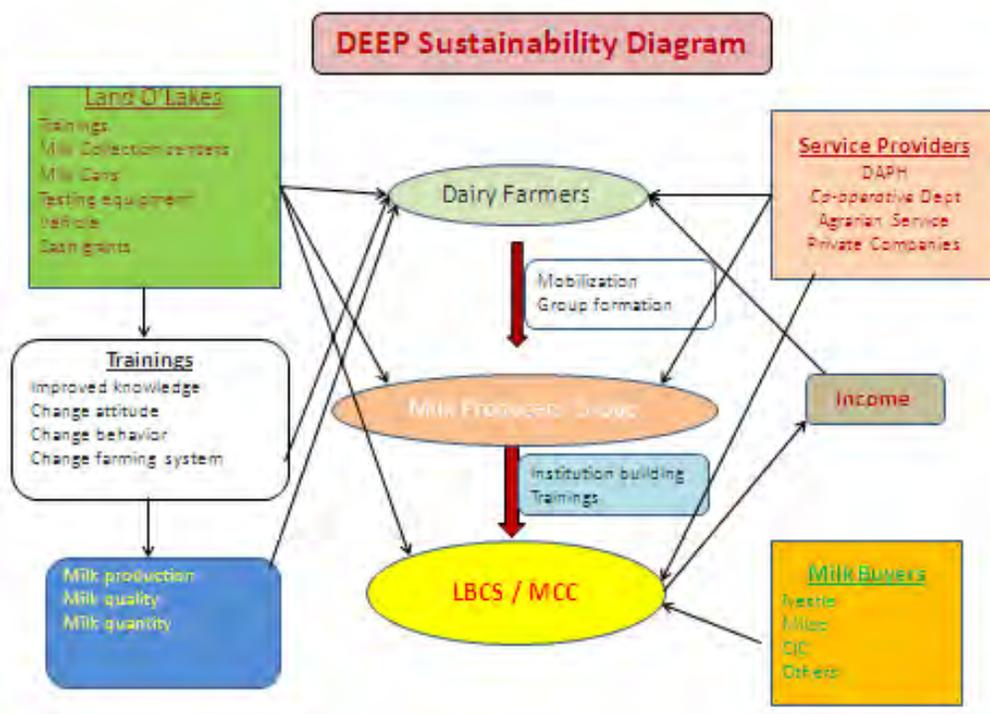
livestock medicines, seed paddy, fertilizer and other related inputs at the wholesale price. In addition to this, CIC has agreed to sell agricultural implements and provide farm vehicles under lease purchase. CIC has offered scholarships to the best farmers abroad to show them model farms and spend time there to learn on hand agricultural techniques practiced by the farmers. CIC has also offered scholarships to their children in the field of education.

DEEP has established another strong linkage between **Hayleys Ltd** which is a leading marketer of animal health products, medicines and food items. They collaborated with DEEP in conducting the module on “Animal Nutrition and Health” in the Dairy Technical Training program. They displayed livestock feeds and pharmaceutical products during the training program and even distributed some goods free of charge. There are several farmers in the interior areas who have been appointed by this company as their local agents for their products. They also supplied these items to some MPGs and MCCs on credit basis. This linkage continues to date.

Financial Sustainability: DEEP has persuaded CIC Agribusinesses to pay LKR 51.00, one rupee above the Guaranteed Price, for per L of milk. This is an increase of 70% in comparison to the Base Line Survey price of LKR 29/-. As a result of this, farmer income has increased and we see a steady increase in the collection of milk by the MCCs. The MCCs charge an amount of LKR 2/- to 3/- for a liter of milk collected by them. This provides the MCCs with finance to pay the salaries for employees, transportation and administration costs. The MCCs are paid fortnightly and this ensures good cash flow and that the MCCs have become credit worthy as several banks have released farmers’ loans to the MCCs. In 2011 Manmunai West MCC has made LKR 350,000 as net profit and deposited it in a separate account for future use.

Linkages with Financial Institutions: This was identified as one of the main gaps during the “GAP Analysis”. Therefore DEEP took action to motivate financial institutions to help fill the gap. Farmers have received around LKR 20 million as loans from the Bank of Ceylon, People’s Bank, National Development Bank, Sanasa Bank and Navakraham, a micro credit organization. This relationship will be sustained with the improved relationship between the MCCs and increased repayment of the loans through them.

Figure 13: DEEP Sustainability Diagram



Final Project Review on Sustainability: The answers given by the beneficiaries for the question during the Final Project Review on the future of the MPGs after DEEP phase out have been given in the following table:

Table 19: Management of MPGs

MPG Management	Frequency	%
1. Have a Committee and functioning	341	90.2
2. MPGs registered	305	80.7
3. Accounts/book keeping	303	80.2
4. Collective decisions	357	94.4
5. MPG self management after the Project	338	89.4

In almost all the MPGs, management was by a committee selected from among its' membership, and they adopted standard accounting procedures and had plans to manage the MPGs themselves even when DEEP phases out.

The trainings provided on good governance and accounting procedures had helped MPGs officials to maintain proper records of milk purchases and sales; which was evident in the field visits.

During interviews with Presidents and Secretaries of farmer organization, they stated that managing dairy organization has now become more a concern of the members who have understood the importance of such organizations for their benefits in the future".

Recommendations

VAT Exemption: At the initial request VAT exemption is given for one year. New request has to be made for the exemption of VAT thereafter. The subsequent exemption is given only for six months. It will be useful if USAID could persuade GOSL to issue VAT exemption for the whole project period.

Life of the Project: Consider extending the life of projects that target to reach out to more beneficiaries and consists of large procurements and construction work.

Scaling Up: It is true that DEEP is a successful project as observed by the Midterm Review commissioned by USAID. There are several positive elements in the implementation of the project. The issue of who will take over and scale up the project after its completion is a big question. A mechanism should be developed together with the GOSL, mainly with the line ministry to continue the work in other areas.

Annex A: Quarterly Financial Status Report

	Total Estimated USAID Amount:	\$3,750,000		
	Total Obligated USAID Amount:	\$3,750,000		
	Obligation Remaining:	\$131		
	Line Item	Budget	Actual Expenditures to Date	Variance
1	Component One - Increase the quantity and quality of raw milk through targeted training and technical assistance	\$1,820,566	\$ 1,802,995	\$ 17,571
2	Component Two – Establish Milk Collection Centers (MCCs) and Forge Linkages with Milk Producer Groups (MPGs)	\$968,965	\$ 966,792	\$ 2,173
3	Component Three – Establish modern dairy processing facilities in a PEER target Province	\$293,395	\$ 297,391	\$ (3,997)
4	Training Costs	\$37,666	\$ 41,989	\$ (4,323)
5	Indirect Costs	\$629,408	\$ 640,700	\$ (11,292)
	Donor Fund -Total	\$ 3,750,000	\$ 3,749,868	\$ 131
7	Cost Share	\$ 937,500	\$ 1,964,270	\$ (1,026,770)
8	Leverage	\$ 5,372,965	\$ 4,879,931	\$ 493,034
	Cost share & Leverage - Total	\$ 6,310,466	\$ 6,844,201	\$ (533,735)
	Total	\$ 10,060,466	\$ 10,594,069	\$ (533,604)
Pipeline Analysis (USD)				
	Total funds committed to Date	Actual Expenditures to Date	Variance	
	\$ 3,750,000	\$3,749,868	\$131	



**FINAL PROJECT REVIEW
OF
DAIRY ENHANCEMENT IN EASTERN PROVINCE
(DEEP) PROJECT**

**LAND O' LAKES INC.
Batticaloa, Sri Lanka.**



**EASTERN UNIVERSITY, SRI LANKA
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Appendix

- 1: Scope of Work (SOW)
- 2: Composition of Team
- 3: List of Key Informants
- 4: Data Collection Tools
- 5: Location of Study Area
- 6: Key Informants Discussions –Batticaloa, Trincomalee Districts_ and Welikande
- 7: Dairy Household Questionnaire
- 8: MPG Questionnaire
- 9: MCC Questionnaire

Units and Abbreviations

CIC	CIC Agribusiness
DAPH	Dept. of Animal Production and Health
DEEP	Dairy Enhancement in the Eastern Province
DS	Divisional Secretariat
DVS	District Veterinary Surgeon
EP	Eastern Province
EPC	Eastern Provincial Council
EUSL	Eastern University, Sri Lanka
GN	Grama Niladhari
HH	Household
Kg	Kilogram
LDO	Livestock Development Officer
Lit	Litres
PEER	Partnership for Eastern Economic Revitalization
LOL	Land O'Lakes
MPG	Milk Producer Groups
MCC	Milk Collection Centres
Rs.	Rupees (LKR)
USAID	United States Agency for International Development
VS	Veterinary Surgeon

Executive Summary

Land O'Lakes, Sri Lanka (LOL) which had implemented the Dairy Enhancement in the East Program (DEEP) under a USAID funded project. DEEP had the objectives of enhancing the productivity of dairy animals, providing training to small scale dairy farmers, formation of Milk Producer Groups, establishing Milk Collection Centers, and imparting modern dairy management technology to dairy farmers of the Eastern Province in Sri Lanka. Land O'Lakes strategic alliance with CIC Agri Businesses to expand economic opportunities for small-scale dairy producers of the province will also leverage CIC Agri Businesses' planned investment in dairy processing facilities in the region, which will build producer-processor linkages to create steady streams of income for the region's smallholder farmers and stimulate additional private sector investments in farm inputs and veterinary and breeding services.

LOL had contracted the Eastern University, Sri Lanka to undertake a final project Review Assessment of the DEEP Project beneficiaries and stakeholders in the Eastern Province. The Eastern University thus conducted a dairy farmer household survey among 378 respondents in the districts of Batticaloa and Trincomalee; to collect information on dairy production and marketing related issues. It also had Key Informant discussions with major stakeholders of the dairy industry and related organizations. The field survey was done using a structured questionnaire during the months of April to Mid-May 2012.

The average age varied from 41 to 46 years, with the mean age was 43 years. This indicates that a young population of dairy farmers was interested in the DEEP activities in the areas. Primary level of education was found to be high (46 to 55%). A majority of respondents (more than 70%) were engaged in farming, livestock production or fishing as their primary means of livelihood in all DS areas surveyed. This moderate level of education could have been the reason for observing the interest of farmers in participating in dairy management trainings.

Through the efforts of LOL staff and farmer cooperation the DEEP project was successful in forming 56 Milk Producer Groups of dairy farmers, with all communities participating. This had helped foster ethnic harmony and peace building in the areas where either Tamils, Muslims or Sinhalese reside as minorities. These MPGs were managed by farmer elected committees and had sound financial management practices that were imparted to them through DEEP's training programs.

The DEEP project had established 5 MCCs in the project areas that were responsible for collection and processing of milk supplied by MPGs formed in the DS areas. These MCCs were very successful in collecting a large volume of milk from the dairy farmers through the MPGs. The MCCs were also paying a high price for the milk supplied based on the quality after testing.

The major push factors that had helped dairy farmers improve their quantity and quality of milk produced were the trainings imparted to them (94.4% respondents) and equipments and grants provided (71%). Also connecting to service providers, being member of a MPG and changed farm management techniques had helped to increase production and the quality of milk.

The types of trainings imparted to beneficiaries included dairy farm management, financial management, feeding, good governance of organizations, legal matters and conflict management. The management practices were modernized or changed very much, with significant number of small dairy farmers using modern techniques in rearing the animals.

The DEEP project had conducted 1,148 AI administrations to the local cattle of farmers to improve the breed stock to enhance milk productivity of the animals. This had been one of the driving forces which helped in improving milk production per cow per day.

Milk productivity per cow, number of times and quantity milk sold weekly had increased for all herd size farmers after the project. The sale price (prices received by farmers) of milk per liter had too shown a significant increase. The volume of milk produced per household per day during the peak period showed marked variations among the DS divisions studied, ranging from 11.26 litres/HH/day in Kinniya (Trincomalee) to 40.8 litres/HH/day in KP South (Batticaloa). But there were no significant changes in the volume of milk produced by households per day even after the project, although some level of increase can be seen.

Milk collected is sold by dairy farmers to close by MPGs and supplied to the nearest MCCs established in the areas. Only a small number of farmers were selling milk the CIC (31%), while the balance farmers sold their milk to MCCs through the respective MPG's in which they are members. The prices received for milk supplied by farmers had shown a significant increase after the project intervention in all DS areas studied.

Variations were observed in the price obtained for milk sold, with the MCCs paying Rs.41.97/Lt, in Manmuani West DS area and Rs.52.58/Lt. in Kinniya DS area. The average price for milk received by the households was only Rs.49/lit. The value of milk produced per household per day ranged from Rs.209 to Rs.757, and was on average Rs. 451.72. It was highest in the Welikanda DS area, where the animals were cross-bred cows; to a lowest figure of Rs.209 per household/day in Koralaipattu South (Kiran) DS area.

The dairy household income of less than Rs.5,000/- per month was among 60.85% of households before the project, while this figure declined to 57.1%. Meanwhile the percent of households receiving dairy income above Rs.5,000/- per month was 11.3% which later had increased to 34.3%. About 84% of respondents stated that the increased income from dairy production had helped improve their family conditions through spending more on children's education, better health care, housing improvements, purchase of new household goods and increased savings.

About 91% of the respondents stated that they had been able to get linked with various support services through the DEEP project participation, to help them increase milk production. These services included veterinary services, dairy management advice and milk buyers. The DAHP was providing the required veterinary services to the dairy farmers in all the areas, including providing medicines and AI services. Veterinary Surgeons (VS) were available in all DS areas to implement the veterinary services and government programs. VS and AI technicians had mobile contacts with Dairy Cooperative officers and farmers to provide assistance whenever required.

The LOL DEEP office had disbursed 3,510 Small Grants to the dairy farmers in the project areas to purchase upgraded breeds of cows for milk production and to increase farm size. About 2,570 improved breed cattle had been purchased by farmers in the project areas. Some farmers had constructed cow sheds for housing cattle. Data also revealed that some farmers had invested their own money along with the grants given to purchase heifer cows or calves.

Many beneficiaries (84% farmers) stated that it will link farmers to dispose milk to other outside markets, it would create some job opportunities in the MCCs for youth (57% farmers) and it would bring about a more efficient process of milk collection and disposal (75% farmers). Many farmers (47%) viewed that they help in reducing wastage through milk spoilage. It was also expressed that chilling centers can help in securing a higher level of reliable income for them.

The annual performance indicators and targets set through the Baseline Survey were analyzed for comparison with current performance, it showed that significant improvements over the targets were observed in dairy related annual income (75.13% increase), micro enterprises established (140% increase), dairy producers trained (115% increase), productivity of cow/day (57% increase), milk collected from MPGs of standard quality (97% increase) and improved MPG linkages with service providers (84.7% increase).

The most important challenges faced by dairy farmers in the GN areas studied are the problems of animal diseases, poor nutrition level of animals, lack of pastures to feed animals, limited access to grazing land, water accessibility and moving animals to other areas during the paddy cultivation periods.

There is a vast potential for developing new dairy enterprises related to milk processing and value added products manufacturing. The large herds available in the project areas and introduction of modern dairy management practices by LOL DEEP have triggered some entrepreneurs to invest. But there are still bottlenecks in financial support to entrepreneurs.

This Final Project Review study provides some recommendations for LOL to adopt in order to sustain the benefits of the project among the beneficiaries.

- 1. Develop a practical and effective plan to advocate to the regional and national institutions involved in livestock production to promote pasture development and nutritional.**
- 2. Improve availability and affordability of high/cross bred cows by establishing more breeding farms and promoting more private breeding farms.**
- 3. Promote SME dairy processing and feed manufacturing industry to cater to enhance concentrate cattle feed supply and providing better linkages with financial institutions, both state and private for investment.**

All the above needs a lot of advocacy work at the regional and national levels and thus mobilizing dairy farmer groups is vital. This could be done by some NGOs operating in the project areas.

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CHAPTER 1

Overview of Dairy Farming and 'DEEP' Project

1.1 Dairy farming in Sri Lanka - Background

Dairy farming is predominantly a smallholder mixed crop–livestock farming operation. Farmers mostly feed their cattle on natural grass available in common lands such as on road sides, river banks, fallow paddy fields, tank beds and other vacant lots, all maintained under rain fed conditions (Presidential Sub-Committee Report, 1997). According to the breeds utilized and the husbandry practiced the dairy production systems of Sri Lanka can be classified into four main categories such as Upcountry (Tea Estate Dairy / Market Vegetable System), Mid Country (Kandyan Forest Garden System), Coconut Triangle and Wet Low land) and Dry Low Land (Ibrahim *et al.*, 1999).

One of the livestock policies of the government is to develop cattle farming and milk producing through the implementation of breeding programmes. Accordingly, government's main target is to produce Sri Lanka's full requirement of milk and milk food locally, through cross breeding of the current stock of cattle and introduction of cross bred cattle, maintain the annual growth rate of national milk production at 8%, increase the daily collection of milk, increase cattle population, increase milk based products, and increase private sector interest for cattle breeding. The USAID DEEP project also addresses some of these objectives through their dairy enhancement project

Dry zone covers the districts of North Central, North and East Provinces and parts of Central, South and North Western Provinces. Indigenous cattle, Zebu cattle and crosses, buffaloes can be seen in this area and they mainly feed the animal by free grazing of nomadic type large herds or sedentary small-medium herds. Herd size is very large compared to other production zones in Sri Lanka which varies from few to 10-25 animals. A cow in the dry zone produces an average of 2.1 lit /day and a total of 300-400 lit / cow over 180-200 day lactation period (Ranaweera 2007).

A provincial level survey of milk producing households showed that only about 15% was consumed by the producing household and 78% production was sold in liquid form, with 6% being produced into curd, and small amount less than 1% was made into yoghurt. Most of the cattle milk was sold to collection centers (46%) with most of the rest split between other households (20%) and private collectors (22%) (Ibrahim, 2000).

1.2 Dairy Industry in the Eastern Province

The rearing or keeping of cattle and buffaloes in their houses for milk production had been a time immemorial and traditional activity among the rural communities in the Eastern Province. Most of the neat cattle (>89%) and buffaloes (>84%) are local breeds, which are found concentrated in the Batticaloa and Ampara districts.

Table 1.1: Livestock Population by District in Eastern Province - 2008

District	Neat Cattle		Buffalo	
	Cross Breed	Local	Cross Breed	Local
1. Trincomalee	9,050	80,850	2,420	18,190
2. Batticaloa	19,119	101,399	12,514	50,067
3. Ampara	6,129	102,146	7,262	49,157
Total	34,298	284,395	22,196	117,414

(Source: Statistical Handbook-2008, EPC)

Most of the dairy farms consist of large herds of cattle and buffaloes, under open-grazing extensive systems of management. These herds of animals are very rarely fed on concentrate feeds or forage. As a result milk productivity of the animals are low, ranging from 0.918 Ltr./cow/day (Ampara) to 0.869 Ltr./cow/day (Batticaloa) and 1.423Ltr./cow/day (Trincomalee); and from 1.192 Lit./buffalo/day (Ampara) to 0.791 Lit./buffalo/day (Trincomalee) and 1.880 Lit./buffalo/day (Trincomalee).

There about 49434 families rearing dairy cattle and 10413 families rearing buffaloes in the Eastern Province (EP). Most of these dairy farm families are located in the Batticaloa and Trincomalee districts. Small dairy farms with less than 25 animals are commonly present in the EP, and the number of farm families in this category ranges from 39114 (neat cattle) to 7122 (buffaloes) (EPC, 2008).

1.3 Dairy Enhancement in the Eastern Province (DEEP) Project

In support of USAID/Sri Lanka's Partnership for Eastern Economic Revitalization (PEER) strategy, Land O'Lakes (LOL) has formed a strategic alliance with CIC Agri Businesses to expand economic opportunities for small-scale dairy producers of the province. Expanding over the next three years, this alliance will build the technical and organizational capacities of dairy farmers and milk producer groups to enhance milk product quantity and quality.

DEEP has been designed to increase both economic prosperity, and increase the chances for lasting peace in the region. This program integrated all ethnic groups (Tamils, Sinhalese, and Muslims) into activities to strengthen the dairy value chain in the province. Because women play a major role in the care and management of livestock in the Province, DEEP's activities were envisaged to foster robust participation of women in all training activities, and ensure increased involvement of women in DEEP program staffing and in MPG and MCC management.

The DEEP program aimed to increase dairy-related annual income by over 60% for 4000 smallholder dairy farmers. The DEEP annual work plan (2009) indicated that the yearly impact on the general economy, both direct and indirect impacts, is estimated to be around Rs.525.6 million (\$4.38 million). It has been estimated that the jointly built plant with private sector firm CIC Agribusinesses would purchase approximately Rs.1320 million (\$11 million) of milk from the Eastern Province over the first five years of its operation. The project is targeted smallholder dairy farmers with less than 20 milking animals (cows or buffaloes) to increase their incomes through provision of modern dairy technology, training and linkage to markets; such that their annual incomes would be raised to provide a decent standard of living (LOL, 2009).

1.4 Land O'Lakes DEEP Project: Approach and Implementation

DEEP was designed to increase both economic prosperity, and chances for lasting peace in the Eastern Province. This program aimed to integrate all three of the region's main ethnic groups—Tamils, Sinhalese, and Muslims—into activities to strengthen the dairy value chain in the east. Land O'Lakes envisages to provide conflict mitigation and relationship building workshops to ensure that targeted dairy farmers work together effectively in managing dairy enterprises. Because women comprise seventy percent of the workforce in Eastern Province and play a major role in the care and management of livestock, DEEP's activities will foster robust participation of women in all training activities, and will ensure increased involvement of women in DEEP program.

Following are the three main components of the DEEP program and their specific objectives:

Component 01:

Increase the Quantity and Quality of Raw Milk through Targeted Training and Technical Assistance:

Organize farmers into Milk Producer Groups (MPGs), provide a small grant for program farmers, and provide skills training to farmers who join the MPGs, and build the capacities and establish linkages with local providers of inputs and veterinary services to enhance the ability of targeted smallholder dairy farmers to increase production of quality milk.

Component 02:

Establish Milk Collection Centers and Forge Linkages with Milk Producer Groups:

Build effective linkages between Milk Producer Groups and the four Milk Collection Centers (MCCs) that will be built and equipped under the three-year program. The main objective is to establish properly equipped and managed MCCs that will encourage and ensure the supply of quality milk to the market.

Component 03:

Establish A Modern Dairy Processing Facility in targeted PEER Province:

To build a modern dairy processing plant with the potential to increase its size as the market expands and located within close proximity of DEEP's targeted milk collection centers

(MCC's) and their milk producer groups (MPG's). DEEP will work with CIC to forge supply contracts with MCCs, forming the basis for raw milk supply to this facility.

1.5 Final Project Review Assessment

The Final Project Review assessment focus was to assess and evaluate the achievement of objectives, intended and unintended outcomes and impacts of the project on the dairy value chain. The evaluation also assessed its impact on the beneficiaries and the sustainability of the achievements after DEEP ends.

The specific objectives of the final project review are as follows:

1. To review the overall impact of the project against its main objectives in the three project components including:
 - Compare the project indicators targets against actual project results;
 - Review and document the impact of the project on the milk production activities, changes in pricing and impact on households dairy income;
 - Assess the social mobilization process and the formation of small groups and the projects contribution in bringing different communities together to work for their wellbeing;
 - Review the process of leveraging investment from the farmers, project partners and other stakeholders and the impact of the activities on the farming system and production of milk; this should include an assessment of the flood relief support provided to around 2642 affected beneficiary farmers and its mitigation effect on them.

2. To document and discuss the factors that contributed to the intended and unintended outcomes of the project.

Land O'Lakes, Eastern Province office; Batticaloa had through a competitive bidding process selected the Eastern University, Sri Lanka (EUSL) to conduct the Final Project assessment in three districts of the Eastern Province, namely Batticaloa and Trincomalee, and also a few GN areas in the bordering Polonnaruwa district (Welikande) and to submit a comprehensive report on the DEEP project impact and sustainability benefits by small holder dairy farmers in the three districts.

CHAPTER 2

Final Project Review Methodology

2.1 Protocol and Procedures

In order to conduct the Final Project Review Assessment in three districts of Batticaloa and Trincomalee and bordering villages of Polonnaruwa (Welikande), the Study Team members had discussions with various officials attached to the Land O'Lakes –Batticaloa office, government institutions dealing with the livestock industry, private sector firms involved and local community organizations. The final project review assessment framework is illustrated in Figure 1. Publications and documents of the above institutions and organizations were studied and secondary information related to dairy production activities was collected.

Field data was collected using a pre-tested structured questionnaire, which was developed in consultation with staff of Land O'Lakes, Batticaloa office, in the study areas among randomly selected smallholder dairy farmers at their residences, during the months of April and May 2012. At the field level discussions were also held with identified Key Informants (Appendix 3) on the nature of dairy farming in the areas visited and salient points were given in Appendix 6.

2.2 Research Design

2.2.1 Survey Areas and Sampling

The field survey areas were predetermined and identified by the Land O'Lakes officers who communicated to the survey team members (Appendix 5). The districts and DS Divisions areas identified and sample sizes are listed in Tables 2.1 and 2.2 below. Most of the study areas were confined to Batticaloa district and a few areas in Trincomalee and Polonnaruwa districts.

Table 2.1: Sample size distribution by District

District	Frequency	Percentage
1. Batticaloa	233	61.6
2. Trincomalee	51	13.5
3. Polonnaruwa	94	24.9
Total	378	100.0

A random sampling procedure was applied to the DEEP beneficiary population in the study areas, to select the required sample size in respective GN and DS areas. Each respondent in the sample was interviewed directly by the enumerators at their homes (Appendix 4).

All responses were noted in the questionnaire administered according to the topics covered related to the DEEP project final review assessment.

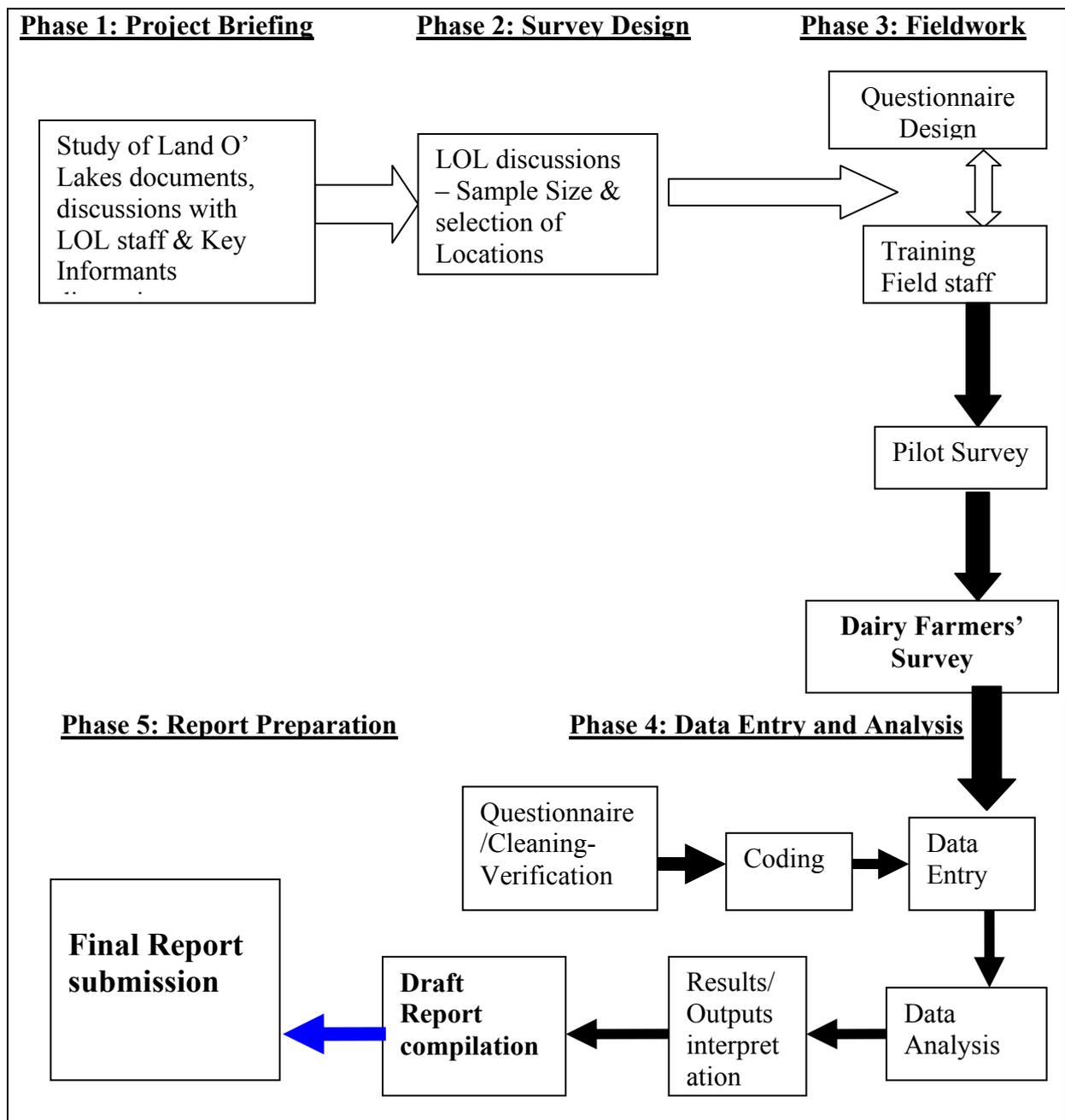


Figure 01: Final Project Review Assessment Framework

2.2.2 Sample Size and Dairy Farmer Selection

The total sample size that was used for the field survey was estimated and provided by the Land O'Lakes office, Batticaloa. A total sample size of 350 dairy farmers was determined for the field survey. But the actual sample size selected for the study was 378 in all three districts. The small dairy farmers were selected randomly from the villages as identified by

the LDO or village headman. Both cattle and buffalo farmers were eligible and selected for participation in the field survey. The details of the sample selection methodology are provided in Appendix 4. Gender of dairy farmers was not considered in sample selection.

Table 2.2: Sample size distribution by Divisional Secretariat divisions

DS Division	Frequency	Percentage
1. Manmunai West	209	55.3
2. Koralaippattu Central	13	3.4
3. Koralaippattu South	11	2.9
4. Kinniya	41	2.6
5. Kantalai	10	10.8
6. Welikanda	94	24.9
Total	378	100

2.2.3 Enumerator Selection and Training

Twenty four undergraduates from the Faculty of Agriculture were selected as Field Enumerators by the study team staff. The Team members explained the purpose of the survey, where and when it is to be conducted. The questionnaire was discussed in detail with the enumerators, and all clarifications raised by them were smoothed out. These enumerators were later trained on how to use the questionnaire in the field to collect correct information from the dairy farmers (Appendix 2).

2.2.4 Data Collection and Analysis

A questionnaire was prepared to collect the relevant information from dairy farmers (Appendix 7). The questionnaire was pre-tested at three locations (Aythiamalai, Vaheneri and Kinniya) and corrections made before being used for the survey proper. Field Enumerators were assigned to collect data using the questionnaire by conducting direct interviews with farmers at their homes. The Team Leader and Project Manager with the District Coordinators were present in the field to check on the interview process and questionnaires filled for errors.

Overwhelmingly there was much support from the dairy farmers in spending some time with the field enumerators and providing responses to questions asked on their dairy production activities. Wherever there were men to respond to questions at the homes visited, women came forward to answer questions on topics they had sufficient knowledge.

There were instances at some households surveyed in obtaining the required information due to the low level of literacy of the respondents. Action was taken to simply the questions and make them understandable to the respondents of low educational levels. When no responses were obtained for many of the questions, such cases were removed from the sample and also from analysis as missing cases.

The filled questionnaires were checked for errors and unfilled questions and cleaning-out was done before coding responses for data entry. The MS Excel (2003) software was used to enter

raw data, and later this data was transferred to the SPSS 12v softwares for statistical analysis. The results of the data analysis from SPSS outputs were used for interpretation.

Interviews were the primary source of information reflected in this report. A total of 378 respondents were surveyed in Batticaloa (233), Trincomalee (51) and Polonnaruwa (94) districts. Respondents were interviewed in their traditional homes through a series of direct community interviews. They responded to a set of questions designed in a conversational manner to avoid the probing question and answer technique which rural communities are wary of.

The distribution of sample size in the different districts, DS divisions, and GN divisions are shown in Appendix 5. The number of dairy farmers selected and interviewed at each GN area/village was slightly larger to capture the variability present. More number of GN areas and villages were surveyed in the Manmunai West in Batticaloa district, Kaakaimunai DS area of Trincomalee district and Karapola in Welikande DS division of Polonnaruwa district. In addition, relevant information was also collected from MPG and MCC officials (Appendix 8 and 9).

CHAPTER 3

Findings of the Field Survey and Observations

The findings of the LOL DEEP Field Survey and field observations are presented below. Analysis is broken down by gender, geographic areas, farming system, ethnic groups; lean and peak seasons, including stakeholder discussions.

3.1 Household Profile by DS areas and Districts

The average age, educational level and gender of respondents are shown in Tables 3.1, 3.2 and 3.3. The average age varied from 41 to 46 years, with the mean age was 43 years. This indicates that a young population of dairy farmers was interested in the DEEP activities in the areas.

Table 3.1: Age of head of household by DS division (years)

DS division	Mean	N
1.Manmunai West	43.2	209
2.Koralaipattu Central	42.1	13
3.Koralaipattu South	40.6	11
4.Kantalai	43.9	10
5.Welikanda	41.2	94
6.Kinniya	45.5	41
Overall Mean Age	42.9	378

Gender of head of household by DS division

DS Divisions	Male	Female	Total
1 Manmunai West	191	15	209
2 Koralaipattu Central	13	0	13
3 Koralaipattu South	10	1	11
4 Kantalai	10	0	10
5 Welikanda	86	7	94
6 Kinniya	40	1	41
Total	350	24	378

Table 3.2: Gender distribution of respondents by DS areas

A majority (94%) of the head of households who responded during the survey was males, and only 6% females had provided responses. This was mainly due to the village social structure where the males dominated in all activities and made decisions. The average age of the head of household did vary significantly among the DS areas, with an average value of 43 years.

Table 3.3: Education level of respondents by DS divisions (%)

Divisional Secretariat division	Educational levels						
	No schooling	Primary (1-5yrs)	Secondary (6-8 yrs)	Secondary (8-10 yrs)	Pass O/L	Upto & Pass A/L (12-13yrs)	Degree
Manmunai West	12.4	55.0	15.3	7.7	6.7	1.5	0.5
Koralaipattu Central	7.7	46.2	7.7	15.4	7.7	15.4	0.0
Koralaipattu South	36.4	54.5	9.1	0.0	0.0	0.0	0.0
Kantalai	0.0	20.0	10.0	40.0	30.0	0.0	0.0
Welikanda	4.3	31.9	21.3	17.0	20.2	5.4	0.0
Kinniya	0.0	31.7	9.8	17.1	14.6	22.0	4.9

Primary level of education was found to be high (46 to 55%) in the Manmunai West, KP Central, and KP South DS areas; while it was also observed that 36% of respondents were uneducated in the KP South DS area. Whereas in the Kantalai DS area more than 70% of respondents were educated beyond the secondary level (above 8 years), and this figure was 38% for KP Central DS area, 42% in Welikanda DS, and 53% in Kinniya DS areas. This implies that dairy farmers in those areas were better educated than farmers in other areas.

The data revealed that for a majority of respondents (more than 70%) farming, livestock production or fishing was their primary means of livelihood in all DS areas surveyed. But it was also observed that for 35 to 40% of respondents in the DS areas of Manmunai West and KP South, wage labour work was their primary source of income for family expenses.

Table 3.4: Primary occupation of respondents by DS division (in %)

DS division	Primary occupation						
	Farming / livestock/ fishing	Wage labour	State sector	Private sector	Self employed	Business	Other
Manmunai West	50.5	34.6	1.0	2.4	4.8	0.5	2.9
Koralaipattu Central	61.5	7.7	15.4	0.0	7.7	0.0	7.7
Koralaipattu South	60.0	40.0	0.0	0.0	0.0	0.0	0.0
Kantalai	70.0	0.0	30.0	0.0	0.0	0.0	0.0
Welikanda	87.2	2.1	2.1	2.1	2.1	0.0	0.0
Kinniya	73.2	2.4	7.3	4.9	2.4	7.3	1.9

Self-employment was marginally observed in the Manmunai West and KP Central DS areas, while business activity was to a lesser extent seen in the Kinniya DS area. This all in all indicates that people of these areas are still dependent on agriculture, livestock rearing or fishing for their livelihood.

3.2 Social mobilization process and formation of small groups

3.2.1 Dairy Farmer Organizations

Land O'Lakes under the DEEP Project had initially mobilized livestock farmers to form Farmer Groups or Dairy Cooperative Societies in the respective DS areas. They had contacted the existing livestock organizations or farmer groups and helped them get organized and form societies to be registered in the DS offices. LOL staff had briefed the farmers about the project and it was vital to mobilize farmers into groups in order to reap the benefits of the project by becoming members in these groups or societies. It was found in the Endline Survey that 90% of farmers surveyed were interested in attaining membership in any dairy related organization, in order to get training and better knowledge on dairy farming. The farmers also stated that the lack of a strong dairy farmer organization was also hindering the development of the dairy industry in the areas.

Table 3.5: List of farmer organizations identified by DS areas

D.S division	Name of Farmer Organization
1. Manmunai West	Self management group; Farm milk collecting centre; MILCO milk production centre; Karaiyakkanthivu Livestock Society, Live Stock Co-operative (5)
2. Koralaipattu North	KPNorth Traders Organization (1)
3. Koralaipattu South	Kiran Kalnadai Valarpu Kooturavu Sangham, Vakeneri Kalnadai Abiviruthi Sangham, Kavathamunai milk collecting center (3)
4. Kantalai	Kanthalai Farming Society, Nestle Milk Chilling Center (2)
	Kantalai milk centre (1)

These dairy farmer organizations help in milk sales, contacting external agencies for assistance and organizing training of farmers. Most of the rejuvenated farmer organizations are functioning to the satisfactory level of the farmers. Regular meetings are held and members informed of the decisions made and actions taken. Also proper financial management through adoption of standard accounting practices is practiced.

It was observed from the data that female membership in farmer organizations was at a higher proportion in KP Central (65%), Kanthalai (75.8%) and Kinniya (34.7%) DS areas compared to others.

Table 3.6: DS area and gender distribution in farmer organization membership

DS division		Total members	No. of Males	No. of Females
1	Manmunai West	61	17	44
2	Koralaipattu	193	67	126
3	Central			
4	Koralaipattu South	58	42	16
5	Kantalai	132	32	100
6	Welikanda	61	25	36
	Kinniya	585	382	203

3.2.2 Formation of Milk Producer Groups (MPG)

Land O'Lakes had mobilized dairy farmers to form milk producer groups to assist in conduct of training programs, technology transfer and provision of equipments and investment grants to the beneficiaries in the project areas. The DEEP project had formed 56 MPGs, and constructed 14 MPG buildings and 42 Mini Milk Collection Points in the project areas. These are managed by dairy cooperatives and being operated efficiently.

MPGs consist of all ethnic groups as members (Kantalai, Kinniya & Welikanda DS areas) and also female participation was more than 57% in all MPGs.

Table 3.7: Gender distribution in MPG membership

DS division	% of males	% of females
1.Manmunai West	27.87	72.13
2.Koralaipattu Central	34.72	65.28
3.Koralaipattu South	37.93	62.07
4.Kantalai	24.24	75.76
5.Welikanda	42.62	57.38
6.Kinniya	65.3	34.7

Table 3.8: MPG numbers, location and membership details

DS division	Name of MPG	Location	Total MPG members
Manmunai West/ Vavunatheevu (8)	Agriculture Livestock Development Board	Vahanery	62
	Integrated Livestock Rearing Association	Karavetti	87
	Integrated Livestock Producers Organization	Villavettuvan	53
	Nediyamadi Kilai Sangam	Nediyamadu	42
	MPG Nediyamadu branch	Nediyamunai	
	Integrated Livestock Producers Organization	Manipuram	50
	Integrated Livestock Producers Organization	Ayithiyamalai	40
	Integrated Livestock Producers Organization	Ayithiyamalai North	
Koralaipattu Central (3)	AI/Shifana women farm organization	Jeyanthiyaya,	72
	Rizvi Livestock Development Commercial Agricultural Co-operative Society	Rithithenna	297
		Kudamanaikal	64
Kantalai (6)	Animal Production and Service Cooperative	Thalagaswewa	132
Welikanda (5)	Muthuwela Dairy farmers society	Muthuwela	68
	Mahindagama MPG	Mahindagama	46
	Manikdeniya Milk Producing Farmer's Organization	Manikdeniya	
	Karapola -Mutugala MPG	Karapola	
	Milk Producer Group-Karapoloa branch	Karapola	
Kinniya (10)	Integrated Livestock Producers Organization	Sooranal Santhi Nagar	642
Koralaipattu South (5)	Milk Collection Center, Kiran	Kiran	24
	Kiran Livestock Farmers Organization	Kiran	78

Almost 95 percent of the MPG's were established with the help of LOL staff and DAPH officials. It was also observed that majority of the members of these MPG's were young persons interested in taking up dairy farming as a livelihood activity.

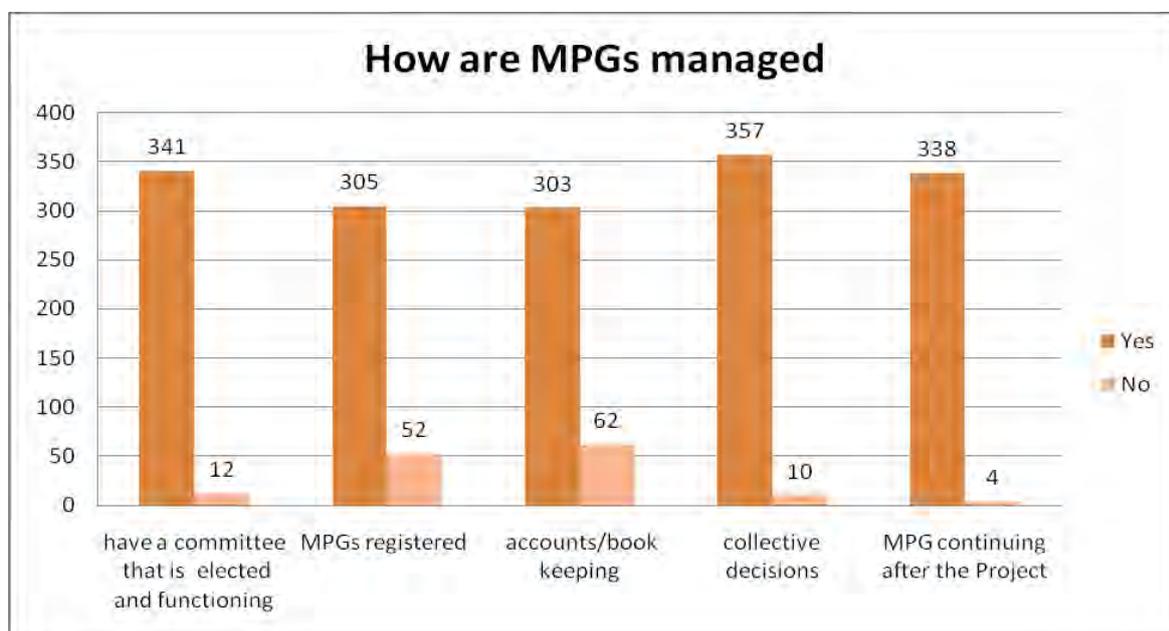
Table 3.9: Management of MPGs

MPG Management	Frequency	%
1. Have a Committee and functioning	341	90.2
2. MPGs registered	305	80.7
3. Accounts/book keeping	303	80.2
4. Collective decisions	357	94.4
5. MPG self management after the Project	338	89.4

In almost all the MPGs, management was by a committee selected from among its' membership, and they (80 percent) adopted standard accounting procedures and had plans to manage the MPGs themselves even when DEEP phases out.

The trainings provided on good governance and accounting procedures had helped MPGs officials to maintain proper records of milk purchases and sales; which was evident in the field visits.

Fig. 3.1: Types of management adopted for MPGs



The DEEP project had through its' activities of establishing MCCs and MPGs helped foster peace building and social harmony among Tamils, Sinhalese and Muslims. But it was observed that only in Welikanda and KP Central MPG were members from different communities present (either both Tamils and Muslims or Sinhalese and Tamils or Sinhalese and Muslims).

3.3 Sustainability of MPGs

On the question of sustaining the functions of the MPG's and managing it properly, respondents stated that they had confidence to manage it themselves in the future or to have links with CBOs or local NGOs to assist them, which was only 7.4 percent of MPGs.

Table 3.10: Sustainability of MPGs

Ways to sustain	Frequency	Percent
1. Confident to continue by own	287	75.9
2. Links established with CBO/NGO	28	7.4
3. Any other way (Cooperatives, Society etc)	31	8.2
4. No answer	32	8.5

During interviews with Presidents and Secretaries of farmer organization, they stated that managing dairy organization has now become more a concern of the members who have understood the importance of such organizations for their benefits in the future

3.3.1 Establishment of Milk Collection Centers (MCC)

The DEEP project had as one of its objectives to establish Milk Collection Centers in the project areas of Batticaloa and Trincomalee districts in order to assist dairy farmers in marketing of their milk and also supply milk to milk processing centers in the province.

Table 3.11: Location of MCCs

DS division	MCC Location	Collection/month (Lts)	Avg. Price/Lt.
1. Manmunai West	Thandiyadi	748,743	48
2. Welikanda	Mutuhwella	412,080	51
3. Kinniya	Kinniya	245,780	48
4. KP Central	Kawathamunai	130,625	50
5. Manmunai West	Aythiyamalai	92,865	48

(Source: LOL, Batticaloa, 2012)

DEEP intervention helped increase the price of milk per liter from Rs. 29/- (Baseline value) to Rs. 36/- (producer price), resulting in an increase of 24.14 percent; while the CIC is offering Rs. 51/- per liter to farmers.

3.4 Dairy Farm Production Systems Improvement

3.4.1 Improving the quality and quantity of milk produced

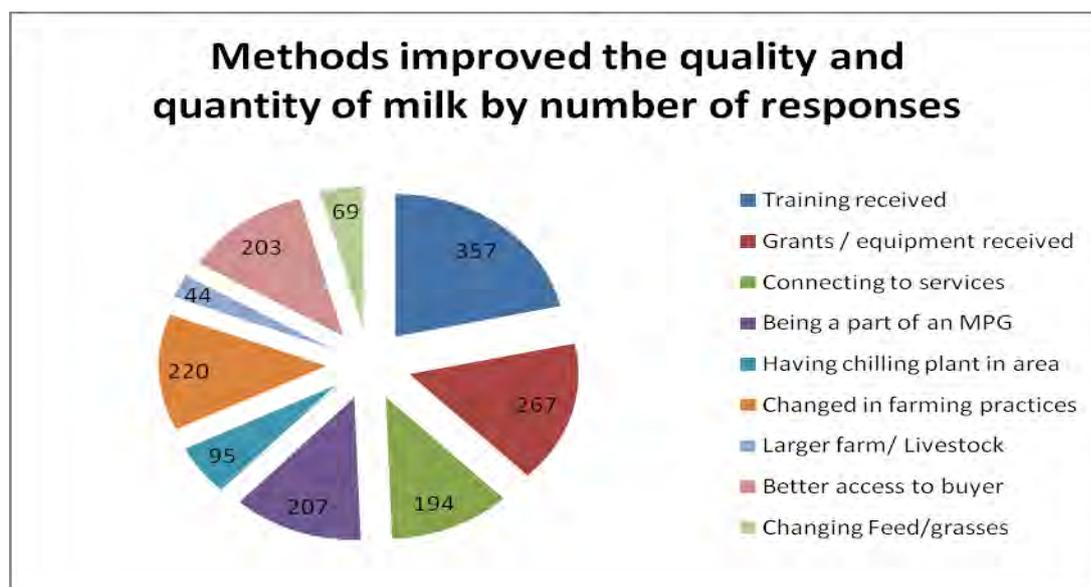
The major push factors that had helped dairy farmers improve their quantity and quality of milk produced were the trainings imparted to them (94.4% respondents) and equipments and grants provided (71%). Also connecting to service providers, being member of a MPG and changed farm management techniques had provided a boost to increase production and quality of milk. Also training programs conducted by LOL- DEEP had a significant impact on improving quality and productivity of dairy farms.

Table 3.12: Approaches that helped in improving quality & quantity of milk produced

Approaches	Frequency	Percent
1. Training received	357	94.4
2. Grants / equipment received	267	70.6
3. Connecting to services	194	51.3
4. Being a part of an MPG	207	54.8
5. Having chilling plant closeby	95	25.1
6. Changed in farming practices	220	58.2
7. Larger farm/ Livestock	44	11.6
8. Better access to buyer	203	53.7
9. Changing Feed/grasses	69	18.3

(Multiple responses for each category)

Fig.3.3: Factors contributing to improvements in milk quality & quantity



Note: beneficiaries reported receiving more than one kind of benefit

The DEEP project through provision of training on milk testing and hygienic milk collection practices had improved the quality of Milk: 90% of the milk produced is above SNF 8.5%, and Fat 3.5% (SLS 181:1983), which is a remarkable achievement of the project in the ‘Conflict-affected’ areas of the East.

3.4.2 Types of Trainings and Management Practices

The production technology is mainly indigenous/ traditional technology with local or traditional breeds being reared by majority of the farmers. Some farmers have adapted to rear cross bred dairy (cows), while most of the buffaloes are indigenous breeds. Open grazing and paddocking of animals was the common form of management present among the dairy households earlier, but now it has slightly shifted to smallholder livestock farmers adopting semi-intensive management practices.

The types of trainings imparted to beneficiaries included dairy farm management, financial management, feeding, good governance of organizations, legal matters and conflict management. The management practices were modernized or changed very much, with significant number of small dairy farmers using modern techniques in rearing the animals. Although they have adopted the use of modern veterinary medicines to control and cure diseases, there is very limited use due to accessibility to veterinary services by most of the farmers in remote villages.

Table 3.13: Types of training received by farmers (N=378)

Types of training received	Numbers	Percent
1.Dairy farm management	369	97.62
2.Financial Management	262	69.31
3.Governance	100	26.46
4.Legal/policy issues	108	28.57
5.Conflict management	109	28.84
6.Feeding	13	3.44

Note: multiple responses

Fig.3.4: Types of Trainings provided to beneficiaries



Note: beneficiaries received more than one kind of training

About 75% of the beneficiaries have rated the trainings as good and useful to them for their livelihood activities. Most of the training programs were related to livestock management and financial aspects of a business activity. Training and technical assistance focused primarily on dairy technology, business planning & capacity building of farmer organization officials, Co operatives, Governance, financial management, milk testing, gender sensitivity, and conflict sensitivity.

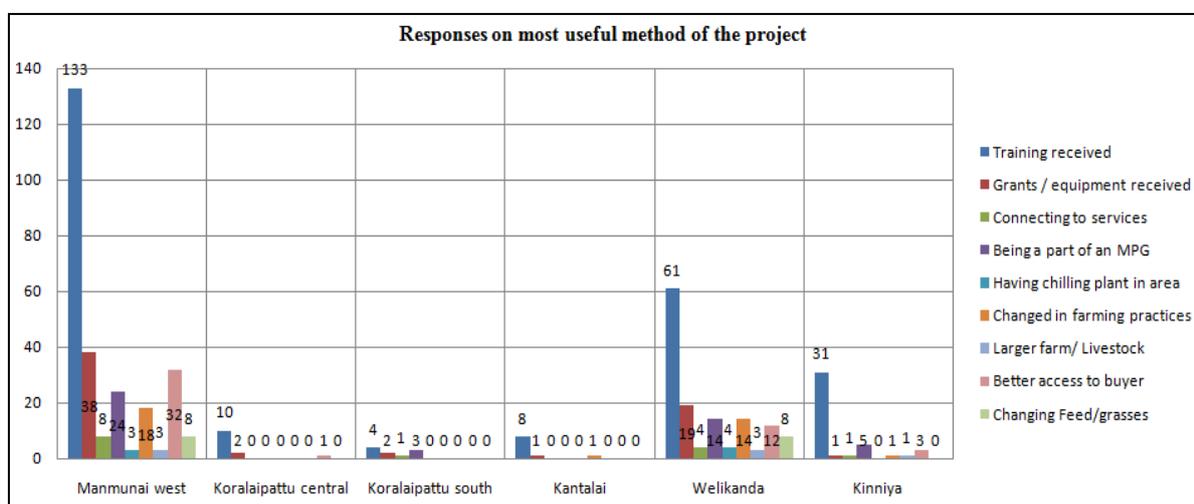
Table 3.14: Respondent’s Ratings of trainings received

Respondent’s Rating	Frequency	Percent
1.Neutral	2	0.5
2.Good	90	23.8
3.Very good	283	74.9
4.No answer	3	0.8
Total	378	100.0

3.4.3 Breed improvement through AI services

The DEEP project as one of its’ interventions in the dairy sector of the Eastern Province had conducted 1,148 AI administrations to the local cattle of farmers to improve the breed stock to enhance milk productivity of the animals. This had been one of the driving forces which helped in improving milk production per cow per day.

Fig.3.5: Responses on useful methods adopted for increasing milk supply by LOL



Trainings provided by DEEP had been identified as a useful means of improving milk productivity by the participants (Fig.3.5). This was followed by MPG membership, grants/equipments provided and better access to buyers of milk.

Table 3.15: Changes seen after the project in relation to Dairy farming

Nos. of cattle & buffalos	Milk per cow /day (lts)		number of times milk sold per week		quantity of milk sold per week (Lts/wk)		Sale price of milk per litre (Rs./lt)	
	Before	After	Before	After	Before	After	Before	After
1	1.45	5.83	1.6	5.0	19.98	19.06	16.25	39.88
2 - 5	2.192	3.314	5.870	6.86	17.654	25.76	23.93	42.67
6 - 10	2.09	4.35	6.36	6.66	27.92	45.46	25.89	44.77
11 - 20	1.54	3.82	6.28	7.42	14.83	62.08	28.70	47.71
21 - 50	2.06	2.90	10.27	7.00	48.87	58.55	32.09	48.30
51 - 100	1.34	1.4	6.40	7.00	123.20	400.00	40.50	50.00

Note: Non-responses = 30 (7.94%), Before = period of 2009, After = period of 2012

It was evident from data that milk productivity per cow, number of times & quantity milk sold weekly had increased for all herd size farmers after the project. The sale price (prices received by farmers) of milk per liter had also shown a significant increase due to the project intervention.

3.5 Volume of milk at the farm level

The volume of milk produced per household per day during the peak period showed marked variations among the DS divisions studied, ranging from 16.06 litres/HH/day in Koralaipattu South (Kiran, Batticaloa) to 46.2840.8 litres/HH/day in Welikanda (Polonnaruwa). But the overall average milk production during the peak period was 26.21 litres/HH/day. There were significant changes in the volume of milk produced by households per day after the project, among the DS areas studied.

Table 3.16: Volume of milk production/household/day (Lts./day/HH)

DS division	Before Project*	After Project*
1. Manmunai West	11.51	16.20
2. Koralaipattu Central	13.47	44.77
3. Koralaipattu South	40.80	16.06
4. Kantalai	14.51	43.67
5. Kinniya	11.25	32.92
6. Welikanda	28.61	46.28
Mean	14.49	26.21

*- Before Project = period of 2009, After Project= period of 2012

3.6 Milk disposal and marketing

Milk collected is sold through various MPGs and supplied to the nearest MMCs established in the areas. A significant number of farmers were selling milk to CIC (31%) after the project (since 2011), while the balance farmers sold their milk to MCCs through the respective MPG's in which they are members.

Table 3.17: Average Milk price per Litre by DS divisions (Rs./litre)

DS division	Before*	After*
1. Manmunai West	30.22	41.97
2. Koralaipattu Central	44.44	49.08
3. Koralaipattu South	31.35	48
4. Kantalai	36.19	51.3
5. Kinniya	51.94	52.58
6. Welikanda	35.40	52.07

Before = period of 2009, After = period of 2012

The prices received for milk supplied by farmers had shown a significant increase after the project intervention in all DS areas studied. A significant increase in milk prices received was seen in the DS areas of KP South, Kanthalai and Welikanda.

Table 3.18: Value of milk produced per household/day (Rs.)

DS division	Before Project Intervention	After Project Intervention
1. Manmunai West	296.23	305.41
3. Koralaipattu Central	212.00	480.46
5. Koralaipattu South	174.50	208.8
6. Kantalai	232.34	273.3
7. Kinniya	389.58	685.4
9. Welikanda	580.72	756.97
Mean	293.51	451.72

*- Before Project = period of 2009, After Project= period of 2012

The value of milk produced per household per day had shown significant increase in all the DS areas studied, especially in KP Central and Kinniya. This had contributed largely to increase in incomes of households after the project intervention.

3.9 Household Dairy Expenses and Income of households

3.9.1 Monthly Expenses on Dairy Farm

The expenditure of households on the dairy cattle has decreased from 50.4% spending less than Rs.1,000 per month to 39.4%; while those spending more than Rs.1000 per month had jumped to 47.61% from 12.43%. This indicates the level of adoption of modern dairy management technology and the willingness to spend more money on the cattle to reap the benefits.

Table 3.19: Change in monthly expenditures of Dairy farm

*- Before Project = period of 2009, After Project= period of 2012

3.9.2 Monthly Income from Dairy Farm

The household dairy incomes per month are shown in Table 3.19 below It was evident that variations exist in incomes received from sale of milk due to the level of output and prices received for raw milk sold. Income from milk sales was only for a period of 6 to 9 months of the year, and this too depended on the weather/climatic conditions prevailing in the areas.

Table 3.20: Changes in monthly income of Dairy farm

Monthly Income (Rs.)	Before*	Percent	After*	Percent
< than 1,000	109	28.84	64	16.93

Monthly expenses (Rs./HH)	Before* Project	%	After* Project	%
1. Less than 500	113	29.89	42	11.11
2. (501 – 1000)	78	20.63	107	28.31
3. (1001 – 1500)	11	2.91	33	8.73
4. (1,501 – 3000)	22	5.82	80	21.16
5. More than 3001	14	3.70	67	17.72
Non- responses	140	37.04	49	12.96
Total	N=378	100.00	378	100.00

1,001 -3,000	85	22.49	91	24.07
3,001 – 5,000	36	9.52	61	16.14
5,001-10,000	26	6.88	75	19.84
> than 10,000	17	4.50	55	14.55
Missing /non-responses	105	27.78	32	8.47
	N=378	100	378	100

*- Before Project = period of 2009, After Project= period of 2012

It was observed that significant changes in monthly incomes from dairy enterprises at the end of the project for the households occurred (Table 3.19). The dairy household income of less than Rs.5,000 per month was among 60.85% of households before the project, while this figure declined to 57.1%. Meanwhile the percent of households receiving dairy income above Rs.5,000 per month was 11.3% which later had increased to 34.3%. This increase had tremendous impact on the household expenses on personal as well as dairy related activities. This was partly attributed to adoption of modern technology in dairy management and improving living conditions.

3.10 Uses of dairy incomes

Figure 3.6 below provide various options of spending at three different levels at studied areas. The dairy incomes were used for various purposes by the households, but the major purpose was to buy staple food items (45.9%) for daily consumption. Only 4.4% of the households purchased medicines from the dairy incomes for the animals.

3.10.1 Impact of income changes on the household

About 84% of respondents stated that the increased income from dairy production had helped improve their family conditions through spending more on children’s education, better health care, housing improvements, purchase of new household goods and increased savings.

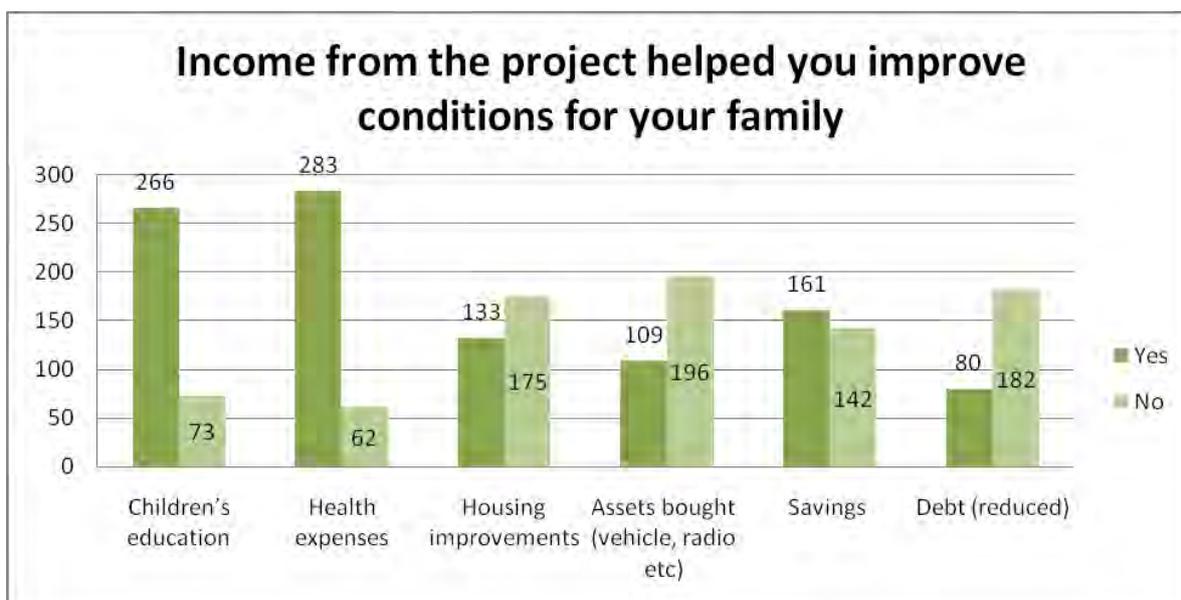
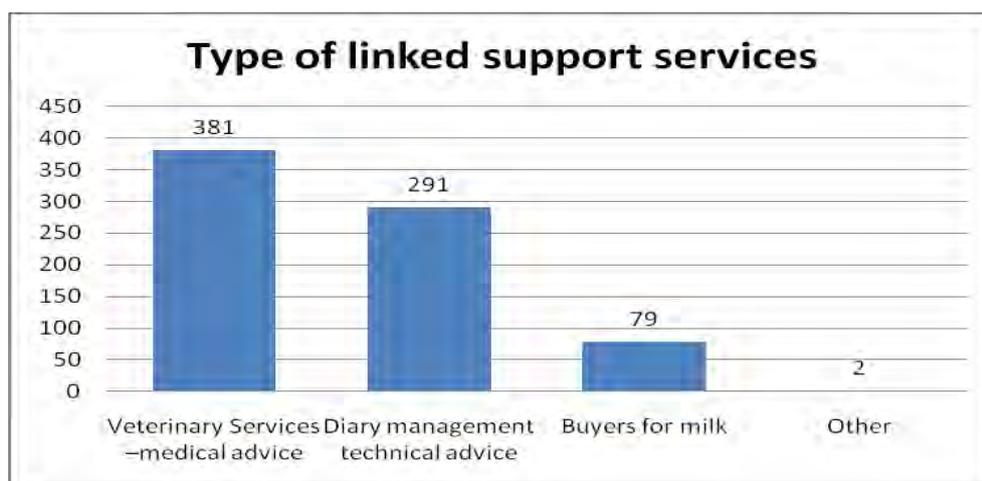


Fig.3.6: Pattern of use of increased income from dairy production

3.11 Linkages with support services

The major service provider to the dairy farmers in the study areas was the Dept. of Animal Production and Health (DAPH), which through its Veterinary Surgeon Range offices located at various places in each DS division, had Veterinary Surgeon's offices that provided veterinary services to the dairy industry. The DAPH was also responsible in providing Artificial Insemination (AI) services to dairy farmers, although this was not up to the expected levels due lack of transport facilities and AI technicians at the VS offices. The AI procedure was only showing 40 to 50% success rate at the farm level. About 91% of the respondents stated that they had been able to get linked with various support services through the DEEP project participation, to help them increase milk production. These services included veterinary services, dairy management advice and milk buyers.

Fig.3.7: Types of linkages with support services



It was found that only 34% of farmers were selling their milk to CIC or other buyers, while the rest were disposing their milk mainly through the MPGs to the nearest MCC at the end of the project (June 2012).

3.12 Equipment provided, Grants disbursed and uses

Under the DEEP project LOL had provided milk collection cans to individual dairy farmers and milk testing units to MPGs to produce quality milk for processing. MPG officials had been trained in the milk testing units and this had helped in collection of quality milk at MPGs and MCCs.

DEEP disbursed 3,510 Small Grants to the dairy farmers in the project areas at the rate of Rs.20,000 per beneficiary to purchase upgraded breeds of cows for milk production and to increase farm size. About 2,570 improved breed cattle had been purchased by farmers in the project areas. Some farmers had constructed cow sheds (915 sheds) for housing cattle under the semi-intensive management system.

The floods of December 2010 and January 2011 affected many dairy farmers in terms of loss of cattle and damage to cow sheds and pasture plots established. Flood Relief assistance to dairy

farmers affected was undertaken by LOL DEEP in February-March 2011 and assistance was provided to 2,426 farmers (almost 52% of beneficiaries) for the and repairs to damaged cow sheds.

3.13 Milk Chilling Centre establishment and benefits

On the question of how chilling plants (MCCs with chilling facilities) will help the dairy farmers, many (84% farmers) stated that it will link farmers to dispose milk to other outside markets, it would create some job opportunities in the MCCs for youth (57% farmers) and it would bring about a more efficient process of milk collection and disposal (75% farmers).

Fig.3.8: Benefits of Chilling Centers to dairy farmers

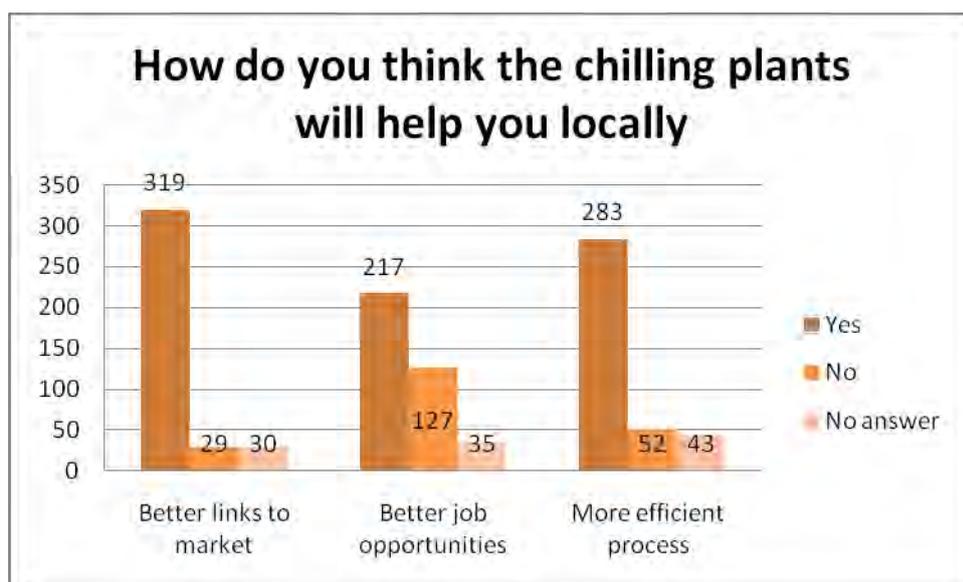


Table 3.21: Perceptions on advantages of the Chilling Plants

Advantages	Frequency	Percent
1.No wastage	161	47.1
2.No processing cost	11	3.2
3.Increased & reliable income	28	8.2
4.No wastage and no processing cost	5	1.5
5.No wastage and increased & reliable income	20	5.8
6.No wastage and any other	17	4.9
7.Any other benefits	100	29.3

Dairy farmer's perceptions on the advantages of the establishment of chilling centers in their villages were assessed. Many farmers (47%) viewed that they help in reducing wastage through milk spoilage. It was also expressed that chilling centers can help in securing a higher level of reliable income for them.

Table 3.22: Processing Centre assistance to community (N=325)

Ways of assistance	Frequency	Percent
1.Increase and continuous income	104	32.0
2.Daily marketing opportunities	87	26.8
3.Job opportunity opportunities	62	19.1
9.All of above	152	46.8

Milk processing center is seen by dairy farmers as an opportunity to increase their incomes, solve marketing problems and creates opportunities for some employment at the village level (Table 3.23). Hence the establishment of milk chilling centers through DEEP project has been a tremendous benefit to dairy farmers of the project areas.

This was evident in the enthusiasm shown by MPGs and dairy farmers in helping to supply milk to the MCCs in their DS areas. This had helped MCC in increasing the volume of milk chilled and processed for further value addition. Nestle and MILCO are the competitors in the areas in collecting fresh milk for small and large dairy farmers.

3.14 Annual Performance Indicators of DEEP Project

The annual performance indicators and targets set through the Baseline Survey were analyzed again to compare the current achievements with actual targets set.

Table 3.24 below shows the results of the analysis and the outcomes. It is evident that significant improvements over the Baseline benchmarks compared to the targets were observed in dairy related annual income (75.13% increase), micro enterprises established (140% increase), dairy producers trained (115% increase), productivity of cow/day (57% increase), milk collected from MPGs of standard quality (97% increase) and improved MPG linkages with service providers (84.7% increase).

Table 3.23: Annual Performance Data Table (APDT)– Achievements

Performance Indicator	Target	Achievement	Remark
1. increase in dairy related annual income	60%	Rs.22,530.36, (75.13% increase)	Increase based on Base line survey findings
2. small dairy farmers benefiting	4000	4000	
3. micro enterprises participating in USG assisted value chains (MPG established)	40	56 (140% increase)	based on end line survey findings
4. jobs created by USG assisted enterprises	0	110	based on end line survey findings
5. dairy producers trained	4000	4600 (115% increase)	based on end line survey findings
6. increase in productivity of milk/cow/day	25%	1.36 liter/cow/day, (57% increase)	Increase based on end line survey findings
7. milk collected from MPG/MCCs meeting pre-established quality standards	90%	97%	Increase based on end line survey findings
8. improved MPG linkages to business service providers	40%	84.7% (Increase of 44.7%)	
9. Microenterprises participating in USG assisted value chains (Milk collection Centers (MCC) established	4	6 (increase of 100%)	based on end line survey findings
10. supply contracts/agreements between CIC and MCC	2	4 (increase of 100%)	based on end line survey findings
11. value of milk purchases from smallholder dairy farmers per quarter	0	\$609,600	At the price of Rs 45.00 at the rate of 38.1 liter/ week / HH for a quarter period (3 months) @ exchange rate of 1US\$=135 LKR

(Source: APDT table, Baseline Survey, 2010)

CHAPTER 4

SUMMARY AND RECOMMENDATIONS

The Endline Study was able to expose some of the salient features of the LOL-DEEP Project impacts on the dairy industry in the districts of Batticaloa and Trincomalee of the Eastern province. It was also instrumental in identifying certain issues related to sustainability of the project activities once LOL phases out of the project areas.

4.1 Summary

4.1.1 Socio-economic dynamics of Beneficiary farmers

The average age varied from 41 to 46 years, with the mean age was 43 years. This indicates that a young population of dairy farmers was interested in the DEEP activities in the areas. Primary level of education was found to be high (46 to 55 percent). A majority of respondents (more than 70%) were engaged in farming, livestock production or fishing as their primary means of livelihood in all DS areas surveyed. This moderate level of education could have been the reason for observing the interest of farmers in participating in dairy management trainings.

4.1.2 Social mobilization and formation of MPGs

Through the efforts of DEEP staff and farmer cooperation the DEEP project was successful in forming 56 Milk Producer Groups of dairy farmers, with all communities participating. This had helped foster ethnic harmony and peace building in the areas where either Tamils, Muslims or Sinhalese reside as minorities. These MPGs were managed by farmer elected committees and had sound financial management practices that were imparted to them through DEEP's training programs.

4.1.3 Establishment of Milk Collection Centers (MCC)

The DEEP project had established five (5 MCCs) in the project areas that were responsible for collection and processing of milk supplied by MPGs formed in the DS areas. These MCCs were very successful in collecting a large volume of milk from the dairy farmers through the MPGs. The MCCs were also paying a high price for the milk supplied based on the quality after testing.

4.1.4 Improving the quality and quantity of milk produced

The major push factors that had helped dairy farmers improve their quantity and quality of milk produced were the trainings imparted to them (94.4 percent respondents) and equipments and grants provided (71 percent). Also connecting to service providers, being member of a MPG and changed farm management techniques had helped to increase production and the quality of milk.

4.1.5 Types of Trainings and Management Practices

The types of trainings imparted to beneficiaries included dairy farm management, financial management, feeding, good governance of organizations, legal matters and conflict management. The management practices were modernized or changed very much, with significant number of small dairy farmers using modern techniques in rearing the animals.

4.1.6 Breed improvement through AI services

The DEEP project had conducted 1,148 AI administrations to the local cattle farmers to improve the breed stock to enhance milk productivity of the animals. This had been one of the driving forces which helped in improving milk production per cow per day.

4.1.7 Increases Volume of milk at the farm level

Milk productivity per cow, number of times and quantity milk sold weekly had increased for all herd size farmers after the project. The sale price (prices received by farmers) of milk per liter had too shown a significant increase. The volume of milk produced per household per day during the peak period showed marked variations among the DS divisions studied, ranging from 16.06 litres/HH/day in Koralaipattu South (Kiran, Batticaloa) to 46.2840.8 litres/HH/day in Welikanda (Polonnaruwa). But the overall average milk production during the peak period was 26.21 litres/HH/day. There were significant changes in the volume of milk produced by households per day after the project, among the DS areas studied.

4.1.5 Ease of Milk disposal and marketing

Milk collected is sold by dairy farmers to close by MPGs and supplied to the nearest MCCs established in the areas. Only a small number of farmers were selling milk the CIC (31percent), while the balance farmers sold their milk to MCCs through the respective MPG's in which they are members. The prices received for milk supplied by farmers had shown a significant increase after the project intervention in all DS areas studied.

4.1.6 Improvements in Farm gate price and Value of milk sold

Variations were observed in the price obtained for milk sold, with the MCCs paying Rs.41.97/Lt, in Manmuani West DS area and Rs.52.58/Lt. in Kinniya DS area. The average price for milk received by the households was only Rs.49/lit.

The value of milk produced per household per day ranged from Rs.209 to Rs.757, and was on average Rs.451.72 . It was highest in the Welikanda DS area, where the animals were cross-bred cows; to a lowest figure of Rs.209 per household/day in Koralaipattu South (Kiran) DS area.

4.1.7 Changes in Household dairy incomes and uses

The dairy household income of less than Rs.5,000/- per month was among 60.85 percent of households before the project, while this figure declined to 57.1 percent. Meanwhile the percent of households receiving dairy income above Rs.5,000/- per month was 11.3 percent which later had increased to 34.3 percent. About 84 percent of respondents stated that the increased income from dairy production had helped improve their family conditions through spending more on children's education, better health care, housing improvements, purchase of new household goods and increased savings.

4.1.8 Service providers

About 91% of the respondents stated that they had been able to get linked with various support services through the DEEP project participation, to help them increase milk production. These services included veterinary services, dairy management advice and milk buyers. The DAHP was providing the required veterinary services to the dairy farmers in all the areas, including providing medicines and AI services. Veterinary Surgeons (VS) were available in all DS areas to implement the veterinary services and government programs. VS and AI technicians had mobile contacts with Dairy Cooperative officers and farmers to provide assistance whenever required.

4.1.9 Equipments and Grants disbursed and investment leverage

The LOL DEEP office had disbursed 3,510 Small Grants to the dairy farmers in the project areas to purchase upgraded breeds of cows for milk production and to increase farm size. About 2,570 improved breed cattle had been purchased by farmers in the project areas. Some farmers had constructed cow sheds for housing cattle. Data also revealed that some farmers had invested their own money along with the grants given to purchase heifer cows or calves.

4.1.10 Milk Chilling Plant and benefits

Many beneficiaries (84 percent farmers) stated that it will link farmers to dispose milk to other outside markets, it would create some job opportunities in the MCCs for youth (57 percent farmers) and it would bring about a more efficient process of milk collection and disposal (75 percent farmers). Around 47 percent of farmers viewed that they help in reducing wastage due to milk spoilage. It was also expressed that chilling centers can help in securing a higher level of reliable income for them.

4.1.11 Improvements in Annual Performance Data Indicators

The annual performance indicators and targets set through the Baseline Survey were analyzed for comparison with current performance, it showed that significant improvements over the targets were observed in dairy related annual income (75.13 percent increase), micro enterprises established (140 percent increase), dairy producers trained (115 percent increase), productivity of cow/day (57 percent increase), milk collected from MPGs of standard quality (97 percent increase) and improved MPG linkages with service providers (84.7 percent increase).

4.1.12 Challenges and Opportunities for Dairy Enterprises

The most important challenges faced by dairy farmers in the GN areas studied are the problems of animal diseases, poor nutrition level of animals, lack of pastures to feed animals, limited access to grazing land, water accessibility and moving animals to other areas during the paddy cultivation periods.

There is a vast potential for developing new dairy enterprises related to milk processing and value added products manufacturing. The large herds available in the project areas and introduction of modern dairy management practices by LOL DEEP have triggered some entrepreneurs to invest. But there are still bottlenecks in financial support to entrepreneurs.

4.2 Lessons Learnt

Through the implementation of the DEEP program in the Eastern Province of Sri Lanka since 2009 for a period of three years, Land O'Lakes has learnt a few lessons in attempting to enhance the productivity of smallholder dairy farmers and increasing household milk production and incomes.

1. Through social mobilization and trainings of smallholder dairy farmers it is possible to enhance the social capital in rural areas.
2. Empowerment of women has been a driving force behind changing management systems in dairy production and adopting modern technology.
3. Dairy herd genetic improvement through AI services has paid its' dividends through increased milk productivity per cow and dairy incomes.
4. Entrepreneurship skills of dairy farmers can be enhanced through training programs and education.
5. Advocacy at the regional and national levels is essential for linking smallholder dairy farmers with service providers.
6. Grants given in the form of equipments and cash caused a dependency attitude among people and cannot be sustained in the long run. These funds could have been utilized for pasture development or to support value addition activities of MPGs.

The lessons learnt through DEEP program implementation could help LOL in programming new projects in the Eastern Province or elsewhere in Sri Lanka in the future.

4.2 Recommendations

The Land O'Lakes has phased out from implementing the DEEP program in the Eastern province. This Final Project Review study provides some recommendations for partner organizations and stakeholders (MPGs, MCC's and CIC Agribusiness) to adopt in order to sustain the benefits of the project among the beneficiaries.

- 1. Develop a practical and effective plan to be advocated to the regional and national institutions involved in livestock production to promote pasture development and nutritional enhancement of dairy cattle.**
 - Needs advocacy work with officials of the Ministry of Livestock Development and local Dairy Farmers' Organizations.
- 2. Improve availability and affordability of high/cross bred cows by establishing more breeding farms and promoting more private breeding farms.**
 - Establish more breeding farms with incentives to small dairy farmers with subsidies etc. through advocacy with officials of the DAPH and Ministry and Dairy Cooperative officials.
- 3. - Promote SME dairy processing and feed manufacturing industry to cater to enhance concentrate cattle feed supply and providing better linkages with financial institutions, both state and private for investment.**
 - Potential entrepreneurs should be identified with the help of the Dept. of SME in the project areas and linked to financial institutions to invest in processing and feed manufacturing industries.

All the above needs a lot of advocacy work at the regional and national levels and thus mobilizing dairy farmer groups is vital. This could be done by some CBOs and NGOs operating in the project areas.

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APPENDIXES

- 1: Scope of Work (SOW)
- 2: Composition of Team
- 3: List of Key Informants
- 4: Data Collection Tools
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- 6: Key Informants Discussions –Batticaloa, Trincomalee Districts and Welikande
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- 8: MPG Questionnaire
- 9: MCC Questionnaire

Appendix -1 Scope of Work (SOW)

1. Scope of Work for the Evaluator

The evaluator conducted the following services:

- a. Undertook literature review of the project documents and other relevant documents.
- b. Organized and undertook field visit to collect the data using quantitative method to address objectives of this end survey. The following target areas were carried for the end survey:

1. Batticaloa District:

Koralai Pattu Central - Rithethenne, Jayanthiyaya, Punanai

Koralai Pattu South- Vakaneri

Manmunai West: Ajithyamalai North, Ajithyamalai South, Nediynamadu,

Manipuram, Vavunativu, Echentivu, Villavettuwana, Karavetty, Panchenai

2. Welikanda:

Welikanda: Muthuwella, Athugala, Muthugal, Mahinthagama, Aselapura,

Menikdeniya, Thalgaswewa, Kudapokuna,

3. Trincomalee District:

Kinniya: kakkaimunai, Ayiliyadi, Eachentheevu, Idemen, Munaichchenai,

Vaananuru, Upparu, Kuttikarachi, Katkuli, Mahamaru, Nadoottu, Periyakenya

Kanthale: Agbopura, Rajeweva

- c. Survey participants were small-scale dairy producers and relevant stakeholders as defined in the selected criteria of beneficiaries of the program.
- d. Regarding quantitative data collection, the estimated samples sizes were collected using random selection of survey participants.
- e. Considered following items to be addressed during the process:
 - a. Household dairy incomes
 - b. Milk yield per breed
 - c. Volume of milk liters at the farm level
 - d. Farm gate price per liter of milk
 - e. Value of milk liters at the farm level
 - f. Cows per farm
 - g. Milk disposal and marketing
 - h. Uses of dairy incomes
 - i. Employment at the farm level
 - j. Service providers (vets, input supplier, AI, transport, finance, etc.)

- k. Current farm production technologies, practices and management
- l. Current farmer organizations
- m. Providers of assistance and training (NGOs, governmental agencies, financial institutions, donors, other organizations)

2. Deliverables

The following deliverables were expected at the Final Project Review evaluation:

- a. One (1) hard copy and an electronic version of the report including, but not limited to:
 - i. Introduction;
 - ii. Protocol, Methods and Tools;
 - iii. Analysis: What the program intended to accomplish versus what was actually found in target areas;
 - iv. Findings: Problems and constraints that might happen during the process of the activities;
 - v. End survey values: the values for relevant indicators from the Results table as well as other indicators discussed with the program team;
- b. One (1) hard copy and an electronic version of the final Presentation prepared based on the final report;
- c. A final presentation to the Land O'Lakes/ Sri Lanka DEEP program and stakeholders;
- d. Original questionnaires prepared by field team;
- e. An electronic version of all datasets in Excel or MS Access format;
- f. Electronic files of applications, modules, and scripts developed to organize, process and analyze the raw data; and
- g. High quality pictures of the process and some survey participants.

Appendix -2

Composition of Team

The following were the members of the Team that conducted the Field Survey, data analysis and preparation of the Final Baseline Report.

1. Dr.M.M.M. Mahusoon, Team leader, Head/Animal Science, EUSL
2. Dr.P.Sivarajah, Project manager, Head/Agri. Economics, EUSL
3. Dr. M. Pagthinathan, Coordinator, Senior Lecturer in Animal Science, EUSL
4. Mr. M.S.M.Nafees, Coordinator, Lecturer in Animal Science, EUSL
5. Ms. K. Saranyah, Field Enumerator
6. Mr. Kesavanath, Field Enumerator
7. Ms. G. Jayapiradha, Field Enumerator
8. Mr. A. Thinesh, Field Enumerator
9. Mr. E. Sanjayaranj, Field Enumerator
10. Ms. C. Manithy, Field Enumerator
11. Ms. T. Mirththika, Field Enumerator
12. Ms. M. B. F. Jemziya, Field Enumerator
13. Ms. L. Lavanya, Field Enumerator
14. Ms. K. Sivashankary, Field Enumerator
15. Mr. T. Sumanthiran, Field Enumerator
16. Ms. S. Dasinna, Field Enumerator
17. Ms. J. Jayapraha, Field Enumerator
18. Ms. V. Menaga, Field Enumerator
19. Ms. A. Hematharshini, Field Enumerator
20. Ms. S. Nivhanthi, Field Enumerator
21. Ms. W. Shanika, Field Enumerator
22. Ms. S. Jeyapriya, Field Enumerator
23. Ms. Y. Inthujaa, Field Enumerator
24. Ms. S. Kavitha, Field Enumerator
25. Ms. S. Kirubasine, Field Enumerator
26. Mr. S.J. Nuwan, Field Enumerator
27. Mr. M. L. H. P. Medenaa, Field Enumerator
28. Mr. K. Kunakeerthan, Field Enumerator

Appendix -3

List of Key Informants

1. Dr.K. Sivalingam Breeding consultant Land O' Lakes.
2. Dr. Shanmugalingam Veterinary Surgeon, DAPH-Manmunai West
3. Dr.Rifhan, Veterinary Surgeon, DAPH-Kinniya
4. Mr. Shanmuganathan, LDI, DAPH, Batticaloa
5. Mr. Pushpathas AI, Technician, DAPH-Manmunai West
6. Mr. Upananda, LDI, DAPH Welikandah
7. Mr. Risvar, Marketing Manager, Hayleys Animal Health

Appendix 4

Sampling methodology and Sample Size

A. Baseline Sample Size Calculations and Study Locations

Sample size for the baseline survey was calculated based on the Sampling Guide from FANTA¹ and was calculated in Microsoft Excel. The sample size was based on the formula showed in Figure 3.2.1.

$n = D [(Z_{\alpha} + Z_{\beta})^2 * (sd_1^2 + sd_2^2) / (X_2 - X_1)^2]$	
KEY:	
n	= required minimum sample size per survey round or comparison group
D	= design effect for cluster surveys (use default value of 2, as discussed in Section 3.4)
X ₁	= the estimated level of an indicator at the time of the first survey or for the control area
X ₂	= the <i>expected</i> level of the indicator either at some future date or for the project area such that the quantity (X ₂ - X ₁) is the size of the magnitude of change or comparison-group differences it is desired to be able to detect
sd ₁ and sd ₂	= <i>expected</i> standard deviations for the indicators for the respective survey rounds or comparison groups being compared
Z _α	= the z-score corresponding to the degree of confidence with which it is desired to be able to conclude that an observed change of size (X ₂ - X ₁) would not have occurred by chance (statistical significance), and
Z _β	= the z-score corresponding to the degree of confidence with which it is desired to be certain of detecting a change of size (X ₂ - X ₁) if one actually occurred (statistical power).

Figure 3.2.1 – Sample Size Formula²

The sample size was calculated from data collected from a previous USAID project. This data was at the farmer household level, and included measures of number of dairy cows, milk productivity, and household dairy incomes. Averages and standard deviations for these variables were calculated from this data set. The annual household dairy income variable was selected to calculate the sample size. Table 3.2.1 shows the sequence followed to calculate the sample size.

¹ Robert Magnani - Sampling Guide - December 1997 - Food and Nutrition Technical Assistance Project (FANTA) Academy for Educational Development

² This figure was taken from: Robert Magnani - Sampling Guide - December 1997

MEAN AVERAGE - DETECTING CHANGE		
Variable	Revenue per year (UGS)	
Entity	Households	
Cluster Sampling?	n	
D		1
Average (Reference)		15359.97
Std Dev (Reference)		17601.21
X1		15359.97
X2		19967.96 30% Increase
sd1		17,601.21
sd2		22,881.58
1 - alfa		95.0%
1 - beta		80.0%
Zalfa		1.645
Zbeta		0.842
n: Sample elements (Large Pop)		242.7
Finite Population (N):	4,000.00	# of expected beneficiaries
n/N		6.1%
n: Sample elements (Finite Pop)		228.8
n: Sample elements (Households)		228.8
Minimum Sample Size (30)		228.8
Contingencies		10%
n: Sample elements (Households)		251.7
Elements / HH:		1
Number of HH		251.7
Number of clusters (30; 30 to 50+)		1
HH / Cluster (50; 40 to 50)		251.7
n: Sample elements (HHs)		251.7 (250 HHs)
n: Sample elements (HHs) in pop		251.7 (250 HHs)
n: Sample elements (Households)		251.7 (250 HHs)

Table 3.2.1 – Sample Size Estimate

A new variable (X2) was created assuming the project increases household dairy incomes by 30%, using the average household dairy income variable (X1). The expected number of beneficiaries for this program is 4,000 households. Table 3.2.1 shows the sample size calculations using these two variables. The resulting sample size was 228, which has the statistical power to detect these changes (from X1 to X2) in the population of interest.

Also, a second sample size was calculated to estimate the average household income with a 95% confidence interval (alfa). This indicated the necessity to random sample 277 households and its calculations are shown in Table 3.2.2.

MEAN AVERAGE		
	X1	X2
Value (u)	15,359.97	19,967.96
StdDev	17,601.21	22,881.58
Range as a % of Value	13%	13%
Range	1,996.80	2,595.83
Zalfa/2	1.9600	1.9600
n: Sample elements (Large Pop)	298.5	298.5
Finite Population (N):	4,000.00	4,000.00
n/N	7.5%	7.5%
n: Sample elements (Finite Pop)	277.8	277.8
n: Sample elements (Households)	277.8	277.8
Minimum Sample Size (30)	277.8	277.8
Contingencies	10%	10%
n: Sample elements (Households)	305.6	305.6
Elements / HH:	1	1
Number of HH	305.6	305.6
Number of clusters (30; 30 to 50+)	1	1
HH / Cluster (50; 40 to 50)	305.6	305.6
n: Sample elements (HHs)	305.6	305.6
n: Sample elements (HHs) in pop	305.6	305.6
n: Sample elements (Households)	305.6	305.6

Table 3.2.2 – Sample Size Estimate

Thus, the greater sample size was taken for the survey (277). Then, drop-out rate of 10% was considered, and the number of households for the sample size 305 which was rounded up to 310 households.

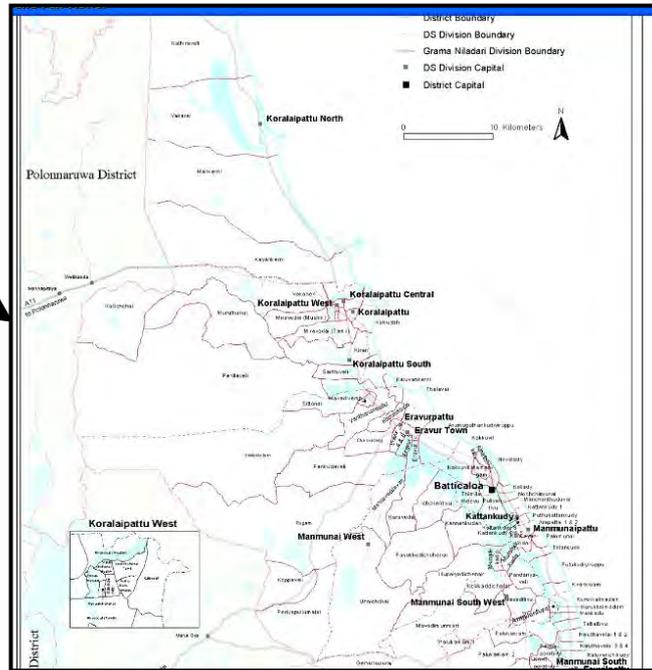
Appendix -5

Location of Study Areas-Districts, DS & GNs

Study Locations: District, DS Division and GN Division

District	DS Division	GN Division(sample size)
1.Batticaloa	Manmunai West	Echentivu (55)
		Vavunativu (31)
		Thandiyadi (21)
		Karavetty(04)
		Ajithyamalai South (37)
		Nediyamadu (23)
		Manipuram (15)
		Ajithyamalai North (23)
	KP Central	Punanai (5)
		Rithithenne (5)
		Jayanthiyaye (03)
KP South	Vahaneri (11)	
2. Trincomale	Kinniya	Kakkamunai (19)
		Ayiliyady (06)
		Nadu-oottu (03)
		Mahamaaru (02)
		Katkuli (02)
		Kuttikarachchi (02)
		Munaichenai (02)
		Eachenteevu (01)
		Idiman (01)
		Waanaru (01)
		Upparu (01)
		Periyakinniya (01)
	Kantale	Rajawewa (08)
		Agpopura (02)
3.Polonaruwa	Welikanda	Muthuwela (08)
		Mahinthagama (26)
		Aselapura (01)
		Menikdeniya (01)
		Karapola (27)
		Athugala (18)
		Kudapokuna (05)
		Muthugala (08)

Appendix -6 Location of study districts in Sri Lanka's map



Appendix 7

Key Informants Discussions – Batticaloa, Trincomalee Districts and Welikanda

■

A. Batticaloa District

Places where discussions were held: Manmunai West (Ajithyamalai North, Ajithyamalai South, Nediymadu, Manipuram, Vavunativu, Echentivu, Villavettuwana, Karavetty, Panchenai), Koralai Pattu Central (Rithethenne, Jayanthiyaya, Vakaneri) and Welikandah (Muthuwella, Athugala, Muthugal).

Majority of the households have livestock, mostly cattle. Cattle are raised on semi intensive and extensive system. Some of them are feeding concentrate feed to the cattle. Most of them do not construct housing or shelter for the livestock. All the dairy animals are local breeds, and a few households had cross bred cows. Women's involvement in cattle rearing was minimal, with keeping the paddock area clean.

Milking is rarely done in most of the animals. Even if they milk the animals, the milk production per cow is around 2 to 4 bottles per day during peak period, and about 0.5 to 2 bottles per day during the lean period. Almost all the households are given the milk to milk collecting centre of the MPG and take to the milk chilling centre (MCC) at Illuppadichchenai, Thandiyady, CIC and Kavathamunai. Milk was also used for home consumption (0.5 to 1 bottle/day/ household) and also sold to neighbours. Marketing of milk is not a problem to dairy farmers in all the DS areas.

During the dry season water to feed was taken from the river: no water problem faced. Rupees 2000-3000/month is the expenses for 5 milking cows, mainly for vaccination, disease control. Peak season normal milk output from local breed is 2-3 litter/day, and lean season milk output: 1-2 litter/day. Calving is generally occurred July to September.

cannot determine the date of calving as January (mostly common one) cz some just deliver

Trincomalee District and Welikande

Places where discussions were held at Kinniya and Kanthale

Nearly all the households have a few livestock, mostly local breeds of cows or buffaloes. Many of the households are having marginal profit from their livestock. Many people who were traditional dairy farmers had lost their animals during the 'war', and had adopted other employment activities. At present, those people are able to rear more livestock. Mostly open grazing system of rearing is practiced, and no additional feeds or housing is provided. Only a very few households, who had cross-bred animals, practiced semi-intensive system of rearing, with provision of housing and additional feeding. Many persons reported that government support for livestock production was poor/weak, especially with AI services being minimal in the areas.

Appendix 8

Dairy Household Questionnaire Dairy Enhancement in Eastern Province (DEEP)

Final Project Review (FPR)

District (1:Batti 2: Trinco 3:Polo)	
DS division	
GN division/ Village	
Veterinary Range	

INTERVIEWER TO COMPLETE ASSIGNMENT RECORD			
E-Code	Name of Enumerator	Signature	Date Interview Completed
S-Code	Supervisor's Name	Signature	Date Checked
<p>Conducted by:</p> <p>FACULTY OF AGRICULTURE, EASTERN UNIVERSITY, SRI LANKA SUB AWARDED BY: <i>LAND O' LAKES, INT. (UNDER USAID COOPERATE AGREEMENT FOR DEEP)</i> March 2012</p>			

1. HH identification Information

1.1 Respondent's Name		1.2 Respondents' relationship to the HHH (use codes in HH composition table)	
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1.3 Who is the main HH member involved in the project?

1. HHH		2. Spouse		3. Son		4. Daughter		5. Other - specify	
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1.4 Is this HH member a part of the Milk Producer Group (MPG)

1. Yes		2. No		1.4.1 If no, why not?	
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1.4.2.If yes, who is the HH member that is holds the membership in MPG?

1. Head of household		2. Spouse		3. Son		4. daughter		5. Other - specify	
----------------------	--	-----------	--	--------	--	-------------	--	--------------------	--

1.5 how long have you been involved in the project? (in years)

1. less than 1 year		2. 1 year		3. 1.1 - 1.5 yrs		4. 1.6 - 2 yrs	
---------------------	--	-----------	--	------------------	--	----------------	--

Main activity of HH member	If Employed: Primary Occupation	Secondary Occupation	Other sources of income	Monthly income
1. Employed	1. Farming / livestock/ fishing	1. Farming / livestock/ fishing	1. returns from investments and assets	1. Less than 5000
2. Unemployed (seeking work)	2. Daily wage labour	2. Daily Wage labour	2. remittances	2. 5001-7000
3. Household work	3. State sector salary	3. State sector salary	3. pension	3. 7001-10,000
4. Student	4. Private sector salary	4. Private sector salary	4. Samurdhi	4. 10,001-15,000
5. Disabled	5. Self employed – micro and large	5. Self employed- micro	5. Public assistance	5. 15,001-25,000
6. Elderly	6. Business – medium and large	6. Business – medium and large	6. Other- specify	6. 25,001-50,000
7. Other (Please specify)	7. Other (please specify)	7. Other (please specify)		7. more than 50,000
	88 Not Applicable	88 Not Applicable		

1.6 How did you hear about this project?

1. The GN		2. Neighbour		3. Other dairy farmers		4. Project staff		5. Other - specify	
-----------	--	--------------	--	------------------------	--	------------------	--	--------------------	--

2. Questions under component 1: increase Quantity and Quality of raw milk through training and technical assistance

2.1 What is the name and location of the Milk producer group you belong to?

1. Name of MPG		2. Location	
----------------	--	-------------	--

2.2 How many members in your group? How many are male? How many are female?

1. Total		2. Male		3. female	
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2.3 What ethnic groups do they come from and how many from each ethnicity? (This should include different ethnicities no? instead of male female)

1. Sinhala (%)		2. Tamil (%)		3. Muslim (%)	
----------------	--	--------------	--	---------------	--

2.4 How were farmers chosen to join the MPGs? (looking for eligibility criteria - geographic location, experience, farm size etc) (open ended)

--

2.5 What are the advantages and disadvantages of being a member and working through the MPG?

1. Advantages	2. Disadvantages
---------------	------------------

2.6 What are the types of training you have received?

1. Diary farm management		2. Financial Management		3. governance		4. Legal/policy issues		5. conflict management	
6. Other - specify									

2.7 Could all the members attend the training?

1. Yes		2. No	
2.7.2 If no, why not?			

2.8 Overall how would you rate the training you received?

Very Bad		Bad		Neutral		Good		Very Good
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2.9 What components/training were most useful/valuable to improve your dairy project (explain - open ended)?

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2.10 Did your group receive any equipment?

1. Yes		2. No	
2.10.1 If no - why not?			
2.10.2 If yes, list what was given	1. Milk Cans	2. Quality testing kit	3. Manuals
			4. Other - Specify

2.11 Has your MPG received small grants for buying livestock, dairy inputs, equipment?

1. Yes		2. No		3. Not yet		4. Don't know	
2.11.1 If yes list what was given (specify)							
2.11.2 What was the value of the goods you received? (Rs)							
2.11.3 what was the value of your own contribution? (Rs)							

2.12 Have you established a building for your MPG?	1. In progress		2. Completed		3. Not yet		4. No such plans
2.12.1 Any remarks regarding this?							

2.13 Have you been linked with any support services?	1. Yes	2. No	3 IF YES, What assistance have you received? Specify				
2.13.1 Veterinary Services							
2.13.2 Dairy management technical advice							
2.13.3 Buyers for milk							
2.13.4 Other - Specify							

3.1 Is your MPG a part of the Cooperative Society/Milk Chilling Centres (MCCs)

1. Yes		2. No		3. Not yet		4. Don't know	
--------	--	-------	--	------------	--	---------------	--

3.2 How many have been set up?

3.3 How far is the chilling plant from your farm?

1. less than 100m		2. 100 - 500m		3. 500 - 1000m		4. 1000 - 1500m		5. More than 1500m
-------------------	--	---------------	--	----------------	--	-----------------	--	--------------------

3.4 How are the cooperative societies/chilling centres functioning? Who runs them? Who is employed there? Are the MPGs members involved? Explain

3.5 Were local people trained to work in the chilling plants?	1. Yes	2. No	3.5.1 if No, Explain	
3.6 Is CIC buying the milk			3.6.1 if NO, Explain	
3.7 Are there other buyers for the milk?			3.7.1 if NO, Explain	
3.8 Can they meet the required 5000lts per day?			3.8.1 if NO, Explain	

4: Impacts of the Project

4.1 Through this project, have you been able to improve the quality and quantity of your Milk?

1. Yes		2. No	
--------	--	-------	--

4.2 If YES, How? Can have more than one answer

1. training received		2. Grants / equipment received		3. connecting to services		4. Being a part of an MPG		5. Having chilling plant in area
----------------------	--	--------------------------------	--	---------------------------	--	---------------------------	--	----------------------------------

	6. changed in farming practices		7. larger farm/ Livestock		8. Better access to buyer		8. changing Feed/grasses		9. Other - specify
4.2.1	What has been most useful? Explain								
4.2.2	If project has not helped, why not?								

4.3 What have been the changes you have encountered before and after the project in relation to Dairy farming

		Before	After	Remarks/how has this change happened?
4.3.1	Cattle			
	Buffalo			
4.3.2	Number of buyers			
4.3.3	Milk per cow (lts)			
4.3.4	Number of times milk is sold per week			
4.3.5	Quantity of milk sold per week (lts)			
4.3.6	Price of sale Rs/ltr			
4.3.7	Quantity of milk sold for middlemen per week (ltr)			
4.3.8	Price of sale for middlemen (Rs/ltr)			
4.3.9	Income from dairy - Monthly/RS			
4.3.10	Monthly Expenses (for feed/maintenance) RS			

4.4 Have your dairy management practices changed as a result of the project?

1. Yes		2. No	
--------	--	-------	--

4.5 If YES, in what areas has it changed?

	Yes	No	What is the result of this change
4.5.1 Adding preservatives			

4.5.2 Access to markets			
4.5.3 Feeding system			Go to 4.5.6
4.5.4. Breeding			Go to 4.5.7
4.5.5 Other			

4.5.6 Feeding System

Kind of grazing system:	1. Zero grazing	2. Open/free range	3. Semi-intensive	4. Others (specify)	
Where do you graze your cattle:	1. own land	2. land of relatives	3. Public land	4. Free graze	5. Others (specify)
Do you produce pasture or fodder?	1. Yes		2. No		
If yes, Pasture spp	1.	2.	3.	4.	5.
Extent of pasture spp					
Fodder spp.	1.	2.	3.	4.	5.
Extent of fodder spp.					
Do you feed paddy straw (conserved pasture)?	1. Yes		2. No		
If Yes, Quantity/day/animal					
Where do you get paddy straw?	1. Own		2. Purchased		
Do you feed tree leaves?	1. Yes		2. No		
If yes, Kind and quantity					
Do you use concentrate feed?					
If yes, kind and quantity	1. Coconut poonac	2. Rice bran	3. Commercial feed	4. Kitchen waste	

4.5.7 Breeding

Type of breeding:	1. AI	2. NS
If NS	1. Supervised	2. Random
If AI, From which VS range did you get the facilities?		
Cost per service		
Are you satisfied with the AI Services and their performance?	1. Yes	2. No

4.6 Are you satisfied with the project in general?

1. YES	2. NO	4.6.1 Why?	
--------	-------	------------	--

4.7 Has the income from the project helped you improve conditions for your family?

	Yes	No	How have you been able to do this?
4.7.1 Your children's education			
4.7.2 Health expenses			
4.7.3 Housing improvements			
4.7.4 Assets bought (vehicle, radio etc)			
4.7.5 Savings - in Rs			
4.7.6 Debt (reduced)			
4.7.7 Other – specify			

Credit

Loan from other sources

Did you receive any small grant for dairy activities?	1. Yes	2. No	
If Yes, How much?			
For which activities you spent the grant?	1. Animal purchasing	2. Housing	3. Others

4.9 Veterinary Services

Do you have access to Veterinary facilities?	
If Yes, Which Veterinary Range?	
Details of Services obtained	
If No, Why?	

5: What are the issues for sustainability?

5.1 how do you think the links established with markets/veterinary support will continue after the project?

--

5.2 How are MPGs managed?

5.2.1 Do they have a committee that is elected and functioning?	Yes	No
5.2.2 Are they registered?	Yes	No
5.2.3 Are there accounts/book keeping that is done?	Yes	No
5.2.4 Do the members make collective decisions?	Yes	No

5.3 How do you see this MPG continuing after the Project? Explain how you think this will happen/any concerns

--

5.4 How do you think the chilling plants will help you locally?

5.4.1 better links to market?	Yes	No	remarks	
5.4.2 Better job opportunities?	Yes	No	remarks	
5.4.3 More efficient process	Yes	No	Remarks	

5.6 What are the advantages and disadvantages you see of the Chilling plants?

5.6.1 Advantages	5.6.2 Disadvantages

5.7 How will the processing centre help your community?

5.7.1 Advantages	5.7.2 Disadvantages

6. Any other comments made by Respondent

--

Observations by Interviewer (Write details of what was observed at the household)

Appendix – 9
DEEP - Final Project Review

Milk Producer Group (MPG)–
Structured Interview Guidelines

Name of MPG :.....

Date of establishment :.....

No. of members:

Gender: Male:..... Female:.....

Ethnic group: Tamil..... Muslim..... Sinhalese.....

Infrastructure facilities: Building: Own/Rented:

Equipment: Own/LOL aid:

Types of equipment:

Milk collection (L/day): Start..... At present..... Milk

price (Rs./L): Start..... At present.....

Basis for milk collection: Fat content/none/others (specify):

Do you use any preservatives? :

Name of MCC where you dispose the milk:

Mode of transport: From beneficiaries to MPG:

From MPG to MCC:

Criteria to select office bearers of your MPG:

.....

.....

Frequency of meeting of office bearers: Weekly/Monthly/Other specify).....

No. of members regularly attending the meeting.....

Appendix – 10
DEEP - Final Project Review

Milk Collection Centers (MCC)-
Structured Interview Guidelines

Location of MCC :.....

Date of establishment :.....

No. of MPG registered :.....

Infrastructure facilities: Building: Own/Rented:

Equipment: Own/LOL aid:

Types of equipment:

Milk collection -Cattle (L/day): Start..... At present.....

Milk collection -Buffalo (L/day): Start..... At present.....

Milk price - Cattle (Rs./L): Start..... At present.....

Milk price - Buffalo (Rs./L): Start..... At present.....

Basis for milk collection: Fat content:

SNF :

Do you use any preservatives? :

Mode of transport:

Where do you dispose the collected milk:

Are you processing the milk:

If yes, What kind of products:

What is your future plan? :

How many employees are working? :

Any other comments:



USAID
FROM THE AMERICAN PEOPLE

LAND O'LAKES, INC.
INTERNATIONAL DEVELOPMENT
Innovative Solutions for Global Prosperity



Dairy Enhancement in Eastern Province, Sri Lanka: Successes and Lessons Learned

Since 2009, Land O'Lakes International Development has been working to increase the incomes of farmers in Eastern Sri Lanka through a robust dairy development program that was made possible by the American People through the **U.S. Agency for International Development (USAID)**. Known as Dairy Enhancement in Eastern Province (DEEP), the three-year program strategically targeted eastern Sri Lanka for economic development efforts, given the region's marked level of underdevelopment following the cessation of more than 25 years of ethnic conflict, and the devastation brought on from the 2004 Indian Ocean earthquake and tsunami.

With many of the farmers in and around Eastern Province's districts of Batticaloa and Trincomalee traditionally focusing their livelihoods on rice and other paddy farming, they have faced significant challenges in making ends meet. Income from paddy work is often insufficient to cover household costs, and it typically requires them to work at locations far from home. Moreover, as farmers are typically only paid once every six months, it complicates their ability to adequately manage household finances. While most farmers owned at least one local breed cow before DEEP, their animals' low yields,

insufficient information about how to increase productivity, and poor market access meant that dairy also historically failed to provide farmers with the resources they needed. Moreover, the economic infrastructure needed to glue the pieces of the value chain together had fallen apart following so many years of protracted conflict.

Consequently, the goal of DEEP was to establish a functioning dairy value chain for at least 4,000 farmers that would link them to functioning markets, and take the requisite steps that would enable them to markedly increase their incomes in a sustainable manner. To achieve this goal, the project focused on three program components: increasing the quantity and quality of raw milk through targeted training and technical assistance; establishing milk chilling center (MCCs) cooperatives that were linked to a network of milk producer groups (MPGs); and establishing modern dairy processing facilities within Eastern Province. As much as possible, the program also sought to rebuild trust across formerly isolated groups – Muslim, Tamil and Sinhalese – through the creation of inclusive, democratically operated cooperative structures, while working to minimize economic imbalances in the region.

Crucial to the success of this public-private alliance was the involvement of **CIC Agri Businesses**, a diversified Sri Lankan agribusiness with 18 affiliated companies. New to dairy processing, CIC recognized that partnering with Land O'Lakes through DEEP would not only help redress longstanding economic imbalances in Eastern Province by uplifting the region's primarily Tamil populace, but it could yield substantial economic profits for them in the long run. Through DEEP, CIC agreed to set a new standard for farm-gate milk prices that even exceeded government recommendations, they provided inputs to farmers at wholesale prices, and they complemented USAID's support of \$3.75 million with \$4.5 million in parallel investments that grew the dairy sector in Sri Lanka, including the construction of a feed mill and enhanced milk processing center in Eastern Province, which used DEEP farmers' milk to produce yogurt for nationwide sale.

The goal of this report, prepared in 2012 a few months prior to the program's culmination, is to provide a qualitative assessment of the impacts the program made, through a range of findings and success stories. Interviews were conducted with over 50 individuals to prepare this report, including with farmers, at MPGs, MCCs, local NGO partners and with staff from CIC Agri Businesses.

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Background

At the inception of the program, there were a number of challenges that had to be surmounted through the effective implementation of the DEEP program. Chief among them was sufficiently encouraging farmers in Eastern Province to restart dairy efforts, after the entire industry had fallen into such massive neglect. Residents had only received relief-focused hand-outs during the war, and were unaccustomed to working with programs that required that they invest their own time and material resources in order to achieve success. Farmers needed other options for survival beyond paddy farming, which only paid them every six months, and required strenuous physical labor on plots of land they typically didn't own and that were located far from their homes.

As a result of the war, the region's economic and physical infrastructure had also fallen into disrepair. The dairy value chain was inefficient and weak, breed quality was poor, private sector investment was minimal, farmers felt no incentive to improve their farming methods, and there was a pervasive feeling of distrust between communities and different ethnic groups that hindered meaningful cooperation.

Meanwhile, the multiple layers of administrative structure at national, provincial, district, divisional and village levels, along with government authorities such as Mahaweli Development Authority, also complicated implementation at the outset. Consequently, DEEP staff had to work carefully to ensure that all interested parties were sufficiently apprised and supportive as the project moved forward.

However, despite all of these challenges, the cessation of war also provided numerous meaningful opportunities for moving forward. The Sri Lankan government was prioritizing economic development in the East, and in March 2011 spearheaded the idea of increasing farm-gate milk prices for smallholders. Moreover, despite the skepticism expressed by some government officials at the outset, CIC's commitment to the project and the financial resources they provided to complement USAID's helped allay misgivings and prove to farmers, the government, banks and the private sector that reviving the dairy value chain would be a lynchpin to vastly improving life for smallholder dairy farmers in Sri Lanka's Eastern Province.



Results Against Targets

Target	Result
Form 40 Milk Producer Groups (MPGs)	<ul style="list-style-type: none"> → Formed 56 MPGs → Constructed 14 MPG buildings and 42 mini MCCs
4,000 dairy producers benefiting from USG assisted value chain	<ul style="list-style-type: none"> → Trained 4,160 Farmers - 44% female, 56% male
Formation of 4 co-op societies/ Farmer Associations which will take care of MCC operations	<ul style="list-style-type: none"> → Established 4 MCCs and an additional mini MCC
Establishment of a processing plant with capacity to process 25,000L per day	<ul style="list-style-type: none"> → CIC established processing plant in Punanai → New plant in Dambulla opening in October 2012 → Increased milk collection - 1.7 million liters collected in 2011
Increase Artificial Inseminations (AI)	<ul style="list-style-type: none"> → 1,148 AI Administrations
Create 110 jobs	<ul style="list-style-type: none"> → Created 105 jobs
Improved linkages with service providers/ financial leverage	<ul style="list-style-type: none"> → Bank loans LKR 20.2M (\$157.2K) → DAPH (supplied crossbred cows) LKR 1.9M (\$14.8K) → Mahaweli Land - LKR 8.9 million (\$69.2K)
60% increase in dairy related annual income	<ul style="list-style-type: none"> → 75% Increase in Annual Income → Farm gate price per liter rose from LKR 29- 51
45% of DEEP dairy farmers are female	<ul style="list-style-type: none"> → Training - 44% female, 56% male → Small grants - 47% female, 53% male
Other	<ul style="list-style-type: none"> → Disbursed 3,510 Small Grants at rate of LKR 20,000 each
	<ul style="list-style-type: none"> → 2,843 cattle purchased
	<ul style="list-style-type: none"> → 651 cattle sheds constructed
	<ul style="list-style-type: none"> → Improvement in milk quality: 90% of the milk produced is above SNF 8.5%, fat 3.5%
	<ul style="list-style-type: none"> → Distributed grass cuttings for 361 farmers
	<ul style="list-style-type: none"> → Flood relief for 2,426 farmers
	<ul style="list-style-type: none"> → Peace building through MCCs/MPGs - 58% Tamil, 19% Sinhalese and 23% Muslim

DISCLAIMER: This report is made possible by the support of the American people through the United States Agency for International Development (USAID). The contents are the sole responsibility of Land O'Lakes and do not necessarily reflect the views of USAID or the United States Government.

Key Lessons Learned

Changes in Farming Practices are Possible:

At the beginning of the program, government veterinary officials expressed skepticism that the program could succeed at expanding farmers' use of artificial insemination (AI), citing a cultural aversion to the practice as the core issue. In Manmunai West, the District Veterinary Surgeon was initially incredulous at DEEP's target of performing 500 AIs in that area for 2010, since she was only able to carry out 47 AIs in 2009. However, veterinary officials' support grew markedly after DEEP carried out 353 AIs in Manmunai West in 2010, and 785 AIs in the Manmunai West, Kinniya and Welikanda

areas in 2011. When interviewed for this report, farmers invariably said they were open to using AI when available; most had simply never known about the practice of AI or the existence of improved breeds before the program.

A wide range of additional changes in farming practices were perceptible, including a willingness to focus on herd quality over quantity, openness to constructing cowsheds and moving away from free-grazing, purchasing productivity-enhancing inputs, and actively making use of available veterinary services.

From Relief to Development: Different Modes of Assistance Can Transition Community Attitudes:

DEEP began shortly after the culmination of the 26-year civil war, and the vast majority of farming families in the area had internally displaced multiple times and forced to live in refugee camps at various points. The assistance they received in these settlements from the Sri Lankan government, NGOs and intergovernmental agencies was invariably in the form of hand-outs of food, shelter and livelihood inputs.

When Eastern Province farmers first learned that DEEP would require them to invest their own time and material resources as a precondition for participation, many flatly refused to participate, and there was a general sense of resistance.

But, as farmers learned more about the DEEP grants and training they would receive, participation started to increase. Those who didn't own a cow purchased one, some began selling their unproductive animals for

improved-breed in-calf heifers, and still others went in search of their local Livestock Breeders Cooperative Society to apply for membership. Ultimately, the majority of farmers accepted the DEEP beneficiary requirements and became active dairy farmers.

Conducted in open areas such as harvested paddy fields, household courtyards and small community centers, and available to all – including mothers who needed to carry their infants along – the training programs helped bring community members together and change mindsets after the war.

DEEP Beneficiary Requirements

- Own at least one cow
- Membership in a Livestock Breeders Cooperative Society
- Actively engage in dairy farming
- Participation in the DEEP training program
- Willing and able to contribute their own funds to match the DEEP grants for purchasing an improved breed animal or constructing a cattle shed

Flexible Training Sessions Enhanced Female Participation and Leadership:

Despite historically low levels of female participation in dairy trainings (only 6% of those interviewed during the baseline said their husbands supported them to attend such meetings), DEEP proposed to achieve 45% female participation by the end of the project. Many considered this to be an unusually high target at the outset, since women are not typically considered the owners of livestock, even when they are their primary caregivers.

Initially, there were indeed far more than women at both the community meetings and DEEP trainings. When it became evident that male participation at trainings was erratic due to their involvement in paddy cultivation and in other income generating activities, DEEP staff explicitly encouraged female participation by making clear that

women could represent their husbands or fathers at the training programs.

Female participation surged as a result, particularly in Manmunai West, where it reached over 50%. Many men in DEEP communities also began to change their mindsets, and acknowledged that women should be the ones who were trained, given their primary roles in dairy work.

Through DEEP, many women advanced to leadership positions in DEEP cooperatives, and gained employment through the MPGs and milk collection Points. By the end of the program, 44% of those attending DEEP trainings were women, as were 47% of those who received cash grants through the program.

Key Lessons Learned

Even Non-Beneficiary Farmers Were Influenced by DEEP:

Although DEEP focused on assisting around 4,000 beneficiary farmers, the program also impacted non-beneficiary farmers. As described earlier, few farmers showed interest in the project during initial community mobilization efforts, with some doubting how a dairy-specific program in their areas could succeed. But as the training program expanded, increasing numbers of farmers attended, including some large-scale farmers who did not qualify for grants, but simply wanted to

enhance their education. When the beneficiary farmers showed more interest in buying thoroughbred cows, non-beneficiary farmers too showed interest in purchasing cows; the same effect was observed regarding the construction of improved cattle sheds and pasture development. Meanwhile, farmers who were not members of cooperatives showed interest in supplying milk to the MCC instead of the middleman, due to the higher price and regular payment.

Technology Helped Connect Remote Farmers with Resources:

Few farmers noted historical success in receiving assistance from Livestock Development Officers or Veterinary Surgeons to care for their sick animals. But DEEP staff members were able to establish positive relationships with the government dairy officials, and got their consent to share their mobile numbers with DEEP farmers. This became an effective mechanism for

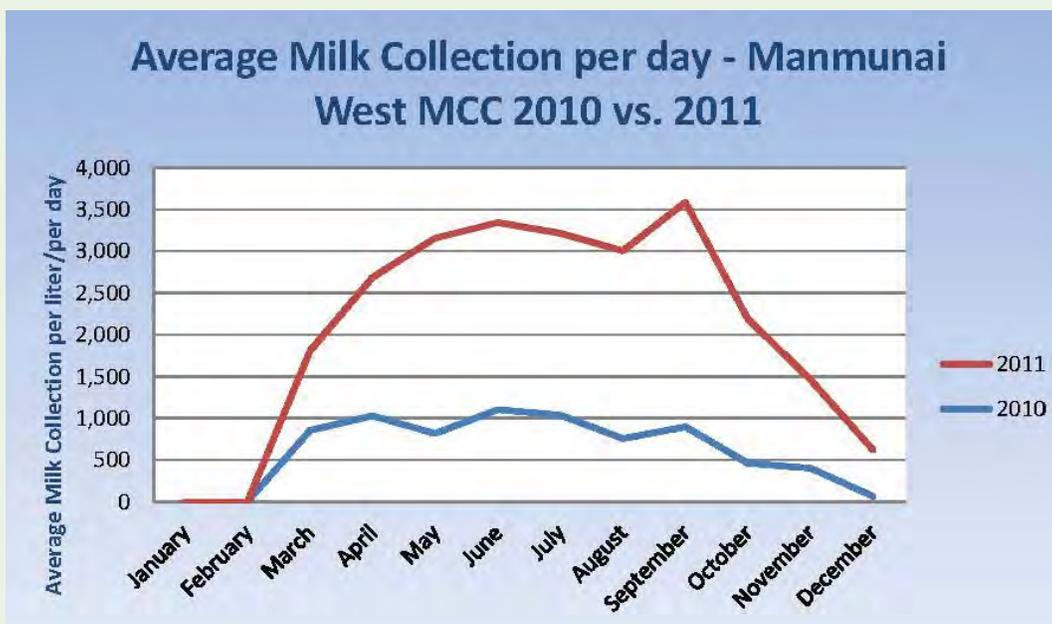
them to receive better veterinary support, especially in more remote areas, as they could virtually describe the symptoms they had observed and find out what medicine was needed. Residents also began regularly calling government vets as well as Para Vets trained through DEEP to report when their animals were in heat and read for AI, or when the birth of a calf was imminent.

Policies, Not Seasonality, Affects Milk Collections:

On the first day when the Manmunai West MCC reopened, it only collected 49 liters of milk. Little by little, the daily collections increased and peaked around 1,500 liters per day. But DEEP staff also observed a clear downward trend from August to December 2010. On the final day of December 2010, the monthly collection was only 64 Liters. When we discussed this with the cooperative and officials from the Department of Animal Production and Health, the explanation provided was that it was the lean season of poor rains. However, DEEP staff members were skeptical that seasonality could have such a large impact,

since the area has enough fodder to sustain the animals. In fact, it was Sri Lankan government orders that animals be herded to the jungles to make way for paddy farming that resulted in such low milk collections.

By establishing innovative collection routes and vehicles that would enable milk collection in remote jungle areas, and also encouraging the building of cow sheds that would obviate the need to relocate their animals, DEEP was able to ensure that milk collection did not experience a similar decrease during the same time frame in 2011.



The Crucial Private Sector Link to Sustainability



Uditha Dissanayake, CIC's General Manager for Livestock Extension



CIC invested US\$4.5M in DEEP, and built a new processing plant in Punanai

In order to create a functioning value chain for smallholders in eastern Sri Lanka, farmers needed to move beyond irregular informal sales to middlemen, and develop a sustainable market-driven link to a private sector processor willing to provide a higher farm-gate price.

Meanwhile, although **CIC Agri Businesses** and its 18 affiliated companies already had a strong commitment to Corporate Social Responsibility and a mission of enhancing Sri Lankan farmers' incomes, the company had limited experience with dairy, and was reticent to invest in the area of Eastern Province during the 26-year war that ended in 2009. Another disincentive was the lack of a common language; the majority of CIC's employees are Sinhalese and do not speak Tamil, the predominant language spoken by farmers in Eastern Province.

DEEP incentivized CIC to develop its dairy capacity because of the program's core goal of supporting public-private partnerships with financial and technical resources. DEEP not only provided CIC with funds and technical guidance to process dairy, but it also provided them with solid supply of milk from DEEP farmers.

"Through DEEP, we saw a great potential to increase our business through dairy, and we did a survey that backed up what a great opportunity it was," explained **Uditha Dissanayake**, the company's General Manager for Livestock Extension. While Sri Lankans consume about 1 billion liters of milk per year, they're only producing 250 million liters, meaning that there's a huge unmet demand.

Through the USAID-funded Dairy Enhancement in Eastern Province (DEEP) program, Land O'Lakes International Development partnered with CIC Agri Businesses through a public-private alliance that enabled over 4,100 farmers to

increase their incomes about 75 percent. Complementing USAID's assistance of \$3.75 million, CIC invested \$4.5 million of its own resources towards expanding the dairy industry in Sri Lanka, specifically in Eastern Province.

"One of the things that really intrigued and encouraged us to move forward with the project was Land O'Lakes' great experience in dairy, engagement with the private sector and value chain approach, beyond just mobilizing and collecting milk from smallholders," noted Mr. Dissanayake.

As of March 2012, CIC was selling 50,000 cups of yogurt a day around the country with DEEP farmers' milk, as well as 15,000 small packets of milk, designed for young children. The company plans to open a new dairy plant in October 2012 in the town of Dambulla, adjacent to Eastern Province, which will enable it to further expand yogurt processing and expand into other dairy products like cheese, with a goal of capturing a 30 percent market share in Sri Lanka's yogurt sector by 2013.

A diversified seed-to-shelf agribusiness, CIC was also eager to build upon on its "double bottom line" investments through DEEP, which could financially benefit both CIC and smallholder farmers simultaneously. Prior to its partnership with the DEEP program, CIC had already established two huge demonstration farms encompassing over 10,000 acres that it uses to teach new farming technologies to over 20,000 rural smallholders.

"More than 70 percent of Sri Lankans living in rural areas rely on agriculture and livestock for their incomes, but field level extension is poor. So, we have been using our farms as a real opportunity to demonstrate best practices to Sri Lankan farmers," said Mr. Dissanayake.

After the government announced a difficult-to-enforce measure to guarantee milk prices would be at least LKR 50



CIC is currently producing 50,000 cups of yogurt each day with DEEP farmers' milk



CIC's dairy plant manager shows off their DEEP milk truck

(\$0.39) per liter, Land O'Lakes persuaded CIC to pay DEEP farmers one rupee more than that, and sell the farmers their agricultural inputs and cattle feed at the wholesale price. "The 4,000-plus out-grower farmers involved in DEEP also need new technologies in breeding, feeding and animal care to reach their full potential. We see an opportunity to introduce them to inputs and services that can enable them to do more with less," explained Mr. Dissanayake.

Consequently, despite the impending culmination of the DEEP program and the financial resources it provides, CIC is committed to continuing and expanding upon their new partnership with smallholders in Eastern Province going forward. "We are eager to build on the successes of DEEP, from working with the cooperative societies and milk producer groups that have been established, to continuing to improve their milk quantity and quality through technical assistance."

To continue these efforts independently, CIC established and staffed a Northeast Development Program in 2011, whose mission is to continue developing agriculture in Eastern Province, with a particular focus on dairy. The company also plans to establish a dairy-specific development unit staffed by officers focused on quality assurance and dairy extension services, and to establish 15 additional milk collection centers over the next few years that will boost CIC's daily milk supplies by an additional 50,000 liters.

"We're in the midst of putting together a comprehensive business plan for the East, and we plan on conducting village and regional-level workshops and forums here to continue developing the area's rich potential for dairy. Through these efforts, we're hoping to develop concrete solutions to the constraints that farmers face," he said.

CIC has already made some inroads towards addressing some of farmers' pressing needs, including facilitating even timelier access to payments. "In January 2012, we began piloting a new mobile milk payment program called Money Saving Tomorrow with 15 farmers through Sri Lanka's National Development Bank. The program uses a SIM card and enables farmers to get paid for their milk every three days. We're now exploring how we can use this kind of technology to also provide farmers with market data on quality, prices and production needs," Dissanayake said.

However, one of the remaining challenges for CIC as it moves ahead with dairy development after DEEP ends is that of language. Mr. Dissanayake says that CIC plans to hire several of the Tamil-speaking extension agents employed through DEEP. "But we need to go beyond this and recruit more Tamils to really succeed in our efforts. Beyond our economic goals in the region, we think that we are part of something larger and more important now that the war is over. We have an important role to play in partnerships where Sinhalese, Tamils and Muslims can work together. That motive goes beyond economic imperatives." ■

"We think that we are part of something larger and more important now that the war is over. We have an important role to play in partnerships where Sinhalese, Tamils and Muslims can work together."

New Bargaining Power Boosts Confidence and Self Reliance



Muhammed Mustapha Buhari and Muhammed Hadji Nias



Mr. Nias admires his cooperative's milk chilling tank

When the **Kawathumunai Self-Help Group** first formed in 1980, they didn't have a chilling tank, transportation or generators, nor did they have the bargaining ability to adjust the price at which they would sell their milk.

According to general manager **Muhammed Hadji Nias**, they eventually received a chilling tank a number of years back from Nestlé, which at least provided them a regular buyer for their raw milk. "But we completely had to depend on Nestlé, and were only getting about 26 rupees (\$0.20) per liter for our milk," explained Mr. Nias. "There was nothing we could do to demand a higher price."

Through the USAID-funded Dairy Enhancement in Eastern Province (DEEP) project implemented by Land O'Lakes International Development, they were encouraged to register as a formal cooperative, which enabled them to bargain for the higher milk prices from CIC Agri Businesses. The cooperative society consists of seven milk producer groups (MPGs) and each has a representative on the board.

Land O'Lakes provided them with a wide range of assistance, including a 2,500 liter capacity chilling tank, a generator, a vehicle with carrying capacity, forty 40-liter milk cans, equipment and training to test for milk quality and adulteration, record books and cards. Kawathumunai's building was also upgraded.

In addition to these items, all 600 members of the Kawathumunai cooperative – who are a mixture of Tamils and Muslims – benefited from a wide variety of trainings that improved the quality and quantity of their dairy yields. Before the training, they didn't know when or how to contact veterinary surgeons, nor did they have any understanding about milk quality.

"We now have the means to test our milk and determine the quality on our own," noted **Muhammed Mustapha Buhari**, the cooperative's president. "In the past, people would bring their milk at any time of the day. But now that we all understand how bacteria develop, our members bring their milk in early so that it doesn't spoil. Also, our members now all use metal milk cans, instead of the less hygienic plastic containers that most of us used in the past."

Over time, the cooperative was able to start demanding a higher price for its members' milk, which now averages 50 rupees per liter (\$0.39). The milk-chilling center doesn't earn a profit, but they do collect 3 rupees (\$0.02) per liter from their MPGs to cover maintenance costs.

"While most of the cooperative's members primarily focus on paddy farming, and just do dairy on the side, some of our members have switched entirely to dairy farming," noted Mr. Nias. "Our dairy incomes are so much higher and come every 15 days, whereas we only get paid once every six months through paddy farming." In addition to the income members are getting by selling their milk, he noted that some are selling calves for money, and the majority is drinking more milk at home. This provides additional nutritional benefits to families, especially women and children who require extra calcium and protein.

While Mr. Nias clearly showed great pride in the chilling tank, milk cans and other types of materials DEEP provided, he said that was not the program's greatest gift to his community. "The most important thing we got through our partnership with DEEP was self-confidence. Now we don't have to rely on anyone else or be forced into accepting an unfair price. CIC Agri Businesses is now offering us a competitive price for our milk. But, if they stop being competitive, we feel a sense of confidence from knowing we can go elsewhere."

Dairy Lights the Way as a Family Rebuilds



Devanayagam



Pushpalatha



The whole family is excited about getting electricity soon

After losing nearly everything they owned during Sri Lanka's 26-year civil war, **Devanayagam** and his wife **Pushpalatha** are slowly rebuilding their lives and their home. When they were resettled to the area of Vahanery in the outskirts of Batticaloa in the country's Eastern Province, they made ends meet by laboring in nearby rice paddies and trying to eke a bit of milk from their local cows.

But, with the inception of the USAID-funded Dairy Enhancement in Eastern Province (DEEP) project implemented by Land O'Lakes International Development, they were able to purchase a crossbreed cow with a LKR 20,000 (\$154) grant provided by the program. They also invested 35,000 rupees (\$270) of their own savings towards the purchase of a second crossbreed cow, which they care for together with their 13 local breed cows. The couple was astounded by the difference in production.

"I now get eight liters of milk per day from the crossbreed! It would take eight local cows to produce that much," exclaimed Pushpalatha. DEEP has encouraged farmers to maximize their labor and minimize environmental pressures by focusing on fewer, higher producing cows.

More than the impact of improved production, the couple says the largest transformation has come from joining the **Vahanery Milk Producer Group (MPG)**. Vahanery is one of 56 MPGs established through DEEP that feed into four Milk Chilling Center (MCC) cooperative societies. This enables the couple to pool their milk with their neighbors and command a substantially higher price than they could have when selling their milk on their own to middlemen. They also benefited from DEEP's five training modules, which improved their knowledge of animal care and breeding.

"We used to sell our milk to a middleman, who would pay us 20-25 rupees (\$0.15-0.19) per liter. But now that we're

part of an MPG that's selling to CIC Agribusinesses, we've doubled our milk income to 40-50 rupees (\$0.31-0.39) per liter. This totals up to 6-7,000 LKR (\$46-54) every 15 days," explained Pushpalatha, who cares for the cows and manages the family's finances. Currently, only three cows are milking, but there are seven that she will be able to milk in the near future. They hope to continue expanding their herd using bull studs, but currently have no access to artificial insemination (AI) services.

The couple has been selling their milk through their MPG for the past year-and-a-half, and, since paddy work is seasonal, they are spending increasing amounts of time focused on dairy. But a remaining conundrum is that when they work in the paddies, they must temporarily move their cows into the jungle to prevent them from freely eating the paddy crops, a measure required by the government for those without cowsheds. They hope to build a shed for their animals in the near future to obviate that burden.

When asked how their growing incomes have impacted their lives, Devanayagam quickly excused himself into the home, and proudly returned with a box of electrical wire in hand. "We started with nothing and rebuilding takes time. But we're finally going to have electricity again very soon!" he exclaimed. ■

"We started with nothing and rebuilding takes time. But we're finally going to have electricity again very soon!"

Delighting in Time with Her Daughters



Seethai Velayutham stands with her herd



DEEP enabled her to boost her income while having more time to spend at home with her daughters



“I don’t have to beg from anyone to achieve my dreams.”

A widowed mother of three girls, it used to be a struggle for **Seethai Velayutham** to have sufficient time with her daughters, since she was forced to spend so much time laboring in the local paddies in order to make ends meet.

But when she got a small grant from Land O’Lakes through the USAID-funded Dairy Enhancement in Eastern Province (DEEP) project for 27,000 rupees (\$208), she was able to add one improved breed cow to her small herd of seven local breed cows. Seethai also learned how to improve production through DEEP’s training modules, which enabled her to refocus her livelihood and how she spent her time.

“I’m now getting 10 liters a day from the three cows that are currently milking, compared to maybe two liters a day that I would get from two,” explained Seethai. But more than just the enhanced production she’s achieved through trainings on animal feeding and care, she’s now earning substantially more money for her milk.

In the past, Seethai has no choice but to sell her milk to a middleman for approximately 30 rupees (\$0.23) per liter, and was unable to request a higher price. But now that she joined a cooperative formed through DEEP – which is selling raw milk for the major Sri Lankan agribusiness CIC to process into yogurt – she’s earning 48 rupees (\$0.37) per liter. That means she’s earning 14,400 rupees (\$111) per month from dairy compared to 1,800 rupees (\$13.88) a month before – which makes a tremendous difference in her quality of life.

Although Seethai was interviewed during the “lean season” of scarce water, which impacts milk production, she said she has already ceased working in the paddies, and is making ends meet exclusively with her dairy income. She is also in the process of securing a loan with other members of her cooperative to buy another improved breed cow – with the MPG serving as her guarantor – something that would have been very hard to successfully secure on her own.

Seethai is also involved with *seettu*, a Sri Lankan version of a Rotating Credit and Savings Association (ROSCA) that is popular among women. While *seettu* does not provide Seethai with any interest on her money, when her turn in the rotation comes, she plans to use the bulk sum she will receive to continue expanding her herd.

“I grew up in the middle of the war, and I don’t have much of an education. I am working to provide a better life for my daughters,” she explained.

Seethai’s goal of truly making an impact on her daughters’ lives seems more tangible now that she’s able to spend more time at home, and nurture them hands-on. “When I was doing labor work, I would come home late and the kids would have to wait for their meals. Now I’m able to spend more time with my daughters, and make sure they grow up right. And I don’t have to beg from anyone to achieve my dreams.” ■

From “Middleman” to MPG Member



Chitravel Poopalapillai used to be a “middleman,” and charged a fee to transport farmers’ milk to buyers



Chitravel is now earning much more money selling his own milk through a DEEP MPG than he ever did as a transporter

While efforts to transform the dairy sector in Sri Lanka’s Eastern Province have had a transformative impact on smallholder farmers, what impact would they have on the middlemen who formerly profited from purchasing farmers’ raw milk at extremely low prices? Would their livelihoods be imperiled?

According to former middleman **Chitravel Poopalapillai**, the USAID-funded DEEP program implemented by Land O’Lakes International Development might have removed his incentive to collect and transport milk for others – since DEEP created a functioning value chain that provides farmers with higher prices than Chitravel ever could – but he’s now making more money through the program than he ever did before.

“In some circles, middlemen get a bad name, even though I was just providing a service where I charged four rupees (\$0.03) per liter to carry others’ milk a long distance to the buyer,” explained Chitravel. “But, honestly, now that I only have to worry about getting my own milk to the Vahanery MPG, and they can take care of getting it to the CIC processing plant in Punanai,

it’s saved me a great deal of time and effort!” He has become so personally invested in the MPG, in fact, that he’s become the group’s secretary.

A full-time dairy farmer with 30 local breed cows, Chitravel also received a grant of LKR 20,000 (\$154) that he combined with his own savings of LKR 17,000 (\$131) to buy a Jersey crossbreed. He says he’s now earning LKR 15,000 (\$115) every 15 days from dairy, which is far more than his income had he been working as a middleman. “Land O’Lakes’ partnership with CIC increased the price we’re getting to LKR 48 (\$0.37) per liter, so I’m not feeling any economic loss!”

Even though he already has 30 animals, he said he wants to save more money to replace more of his cows with improved breeds. “I have to admit that I have no life without animals, they mean everything to me. But I have also learned that I can earn more with fewer, improved breed animals. My dream is to help my daughter buy her own home within the next few years, so I’m committed to earning and saving as much as I can now.” ■

“Now that I only have to worry about getting my own milk to the Vahnery MPG, and they can take care of getting it to the CIC processing plant in Punanai, it’s saved me a great deal of time and effort.”

Finding Her Own Voice Through Cooperative Development



No longer isolated, Saithoon Umma Umar Lebbe says she's found her voice, and is no longer shy about speaking her mind



Mr. Uwais, center, is one of only four men in Saithoon Umma's 150-person MPG

For most of her life, **Saithoon Umma Umar Lebbe** says she felt isolated and rarely dared to speak with the men in her midst, because of cultural gender barriers. But, like a geyser ready to explode, she ultimately reached a point where she could no longer bear to remain voiceless. “I said to the women around me, we have to develop this developing world!”

Now – the antithesis of someone who feels silenced – Saithoon Umma, 47, animatedly described in rapid-fire sentences the momentous feeling of finding her voice. “We started our society on September 24, 2004, and were just a small group of 10 or 15 women who decided to come together to save money and improve our quality of life,” she said, adding, “We had all been displaced several times because of the war, and thought we might be able to get help from the government and NGOs if we formed a society.”

Indeed, life was enormously difficult for Saithoon Umma during the war. First displaced in the mid-1990s to a nearby jungle, in 2007 she was displaced once again to a refugee camp near the town of Welikanda, but later faced trouble there, too. After the war ended in 2009, a member of parliament moved her to the town of Jayanthiyaya, and provided her with a deed to the land where she now lives.

Although dairy has long been the primary source of income for people in Jayanthiyaya – with some of them working in the paddies or raising poultry to supplement their incomes – the women never bulked their milk together before they began receiving assistance from Land O’Lakes through the USAID-funded Dairy Enhancement in Eastern Province (DEEP) project.

“Since we had no direct connection to a processor, we used to sell our milk to a middleman who gave us advance money and bought our milk for about 25 rupees (\$0.19) per liter,” Saithoon Umma explained. “But, through the DEEP program, we were able to transform into a producer group and sell our milk together to CIC, which is paying us 51 rupees (\$0.39) per liter.” The milk processing center that CIC established in Punanai with the support of DEEP is only a few kilometers away from her home.

With her income doubled, Saithoon Umma has been building up her savings, putting money towards her children’s education, buying furniture for her household, and contributing funds towards the sattu Rotating Savings and Credit Association, which she plans to use for purchasing another cow when her turn at getting a lump payout comes. “I realized over time that something had changed inside me, and that I had the strength within me to provide for my

family. I no longer felt isolated or scared to speak with men. And I knew I had some power and strength of my own.”

Beyond the direct training they received, Saithoon Umma says that she was particularly inspired to learn from others’ successes. “Through DEEP, I was able to visit a private dairy farm established by a mother and son, which initially sold only 5-10 liters a day,” she recalled. “They had almost given up, but the son wanted to continue. And, due to their fortitude, they now have a fridge, cooler and processing plant. From two cows, they now have a real dairy farm. Seeing that success first-hand inspired me. I want to help the women I’m working with reach that level, too.”

Since 2009, Saithoon Umma’s group has grown to 150 people, only four of whom are male. When the only male member present, **Mr. A.A. Uwais**, was asked why he chose to join a women’s group, he said, “I didn’t think women could do everything on their own, and felt that maybe they needed a man’s support.”

Later in the discussion, Mr. Uwais excused himself to help one of his children nearby. Saithoon Umma used that opportunity to say, “I don’t mind if men want to join our group and share in our growing wealth. But I can tell you with certainty that we women can do this on our own!”

Feeding a Growing Desire for Inputs



Udayanga Gampolakotuwa's MPG is tapping into the growing need for inputs



Mr. Gampolakotuwa points out some of the components of his "secret blend" of animal feed



With increasing numbers of farmers across Sri Lanka's Eastern Province enriching their livelihoods through dairy development, it has created a growing need for inputs and services that can maximize productivity. And so, while most of the MPGs connected to Land O'Lakes' USAID-funded DEEP program have been focusing their efforts on milk collection, some have decided to focus on producing the inputs needed to meet this growing demand.

At the beginning of 2012, as a result of the business development training they received through DEEP, the **Mahindagama MPG** decided to capitalize on area residents' burgeoning desire for premium animal feed. Using materials sourced from Colombo, and training they received through DEEP and their newfound partnership with a government Livestock Development Officer, they developed their "secret blend" formulation of seven specially selected ingredients.

According to the MPG's President, **Udayanga Gampolakotuwa**, they're producing 2,000 kilos of animal feed per month in response to the volume of orders they have already received in just the first few months after start-up. He said, "We are really excited about the possibilities of our new enterprise. For each kilo of feed we sell at 30 rupees (\$0.23), we are making a net profit of 20 rupees (\$0.15). That income is

benefiting the 71 members of our cooperative and employing three people who operate the business."

In addition to Mahindagama MPG's hand-mixed formulation of animal feed, which is designed to best meet the needs of lactating cows, they are also now serving as a local agent for Hayley's Agriculture, a major producer of pet, livestock and poultry feed that is serving all of the other MPGs in the area.

Having only been in operation for four months, it was hard for Mr. Gampolakotuwa to predict how large the MPG's potential market might be. "Right now, it's only MPGs here in the Welikanda cooperative that are purchasing our feed, and we're using our new link to the government veterinary service to share knowledge with other areas."

Encouraged by their early success, the MPG is already looking into buying machines to assist with grinding the feed ingredients and sewing the feedbags. Looking forward, Mr. Gampolakotuwa said, "We would ultimately like to produce more over time, and find a way to market our feed outside of Welikanda. But, our next step will be to get our special formulation registered. We've already begun that process, and expect that we will get approval to move forward within the next month." ■

"We would ultimately like to produce more over time, and find a way to market our feed outside of Welikanda. But, our next step will be to get our special formulation registered."

Justice for Humans and Animals Alike



Ajith Bandara, center, the MPG's president, says the community is now looking after animals like family members



A member of Menikdeniya MPG tests the temperature of milk for freshness

“Before, we were treating animals like animals in the jungle; now our cows are looked after like members of the family. Today, there’s justice for animals!”

Before the members of the **Menikdeniya MPG** came together in August 2010, the farmers were scattered, and doing their best to make ends meet with the 32 rupees (\$0.25) per liter they typically received from the local middleman.

According to the group’s secretary **Asela Pushpakumara**, who has been rearing animals for over 20 years, “We had all been looking after animals like animals. Now, we rely on animals, and have started becoming more purposeful about how we’re managing our farms. We are no longer just going through the motions.”

Mr. Pushpakumara and other members of the Menikdeniya MPG explained that before they began receiving assistance through the USAID-funded Dairy Enhancement in Eastern Province (DEEP) program implemented by Land O’Lakes, they had no understanding about which breeds were the most productive, how to care for their animals, where their animals should graze, nor did they care about whether their animals produced milk or not.

In this part of the island, while Sri Lankans have a practice of keeping their animals in the jungle so that they could freely graze and not consume the

paddy harvest, a major focus for DEEP has been promoting zero grazing, and keeping fewer, high-producing animals at home in cattle sheds, where they can be fed regularly with grasses, fodder and minerals.

According to **Ajith Bandara**, president of the Menikdeniya MPG, “When we were working alone to make money from our milk, our lack of knowledge was a real challenge. We had no artificial insemination or hybrid animals, no real place to sell our milk, and no standards for quality.”

Because they are able to sell their milk directly to CIC Agri Businesses, they are now getting at least 51 rupees (\$0.39) per liter, compared to the 32 rupees (\$0.25) provided by the middleman to whom they used to sell their milk.

Members of the Menikdeniya MPG note that since they’ve only been working collectively for the past year, they’re trying to reinvest whatever income they earn back into dairy. This has included artificial insemination services, which cost about 300 rupees (\$2.31), and members are also using their earnings to provide their animals with supplementary mineral feed. “We weren’t even aware that AI was a possibility before, but we’ve already started using this practice. We can see for ourselves the results

– we’re getting hybrid animals – and this never would have been possible if we were using a bull stud,” noted Mr. Pushpakumara.

As the residents of the Menikdeniya MPG live on land designated for a Mahaweli program, which is a large government-led rural development program, they have also been able to tap into wider government resources through DEEP.

One opportunity this provides is the potential for opening up breeding farms. One member explained that if a female calf is born on a breeding farm on Mahaweli land, the government will provide 6,000 rupees (\$46) per month to feed her adequately for six months, and then she can be sold to another farmer. The Mahaweli authority also promised to give them 60 cattle sheds, with 39 completed so far. The chief priest of this Buddhist Sinhalese community also donated 32 animals to the villagers.

In addition, through their new connection to CIC, the farmers at Menikdeniya are able to access a range of

agricultural inputs, including Napier grass cuttings, although they’re still hoping to bargain for a lower price. Members are also discussing how they can expand their cooperation beyond dairy, to purchase paddy seed at a reduced price.

President Ajith Bandara noted that beyond the business benefits, working together through a cooperative has increased the sense of unity among the 71 members, 25 of whom are women. “Now we’re not just talking about our animals all the time, but about other things, as well. We are starting to develop other informal community arrangements that we never had before, such as having everybody contribute time and resources when there’s a funeral.”

Meanwhile, the MPG is in the process of working to secure a group loan that would enable 15 of their members to purchase additional animals. “We never thought of trying to get financing in the past. But, why would a bank give a loan to support an animal that’s living in a jungle?” Mr. Bandara asked rhetorically. “Before, we were treating animals like animals in the jungle; now our cows are looked after like members of the family. Today, there’s justice for animals!” ■

“Finance Minister” Determined to Grow Her Herd



“Finance Minister” Siththy Marliya
Hamoordeen



Siththy Marliya's daughter



Siththy Marliya and other women of the
Ritheethenna MPG

Now that she’s managed to increase her herd from just one cow to 11 in just two years, **Siththy Marliya Hamoordeen** says there’s nothing she won’t do to grow her dairy business.

Starting off with only one cow, she was able to get a second animal through a small grant of LKR 20,000 (\$154) provided through DEEP. Later, when it was her turn to get cash through her sattu Rotating Savings and Credit Association, she bought another two. She then pawned her jewelry and worked through her 124-member **MPG in Ritheethenna** to get another two cows through bank loans. “Jewelry is of no use to me, so I sold it all. But a cow has real value, and every 15 days I can get more money!”

“Including my calves, I now have 11 cows in just two years, and the increased income is really changing my life,” she says.

From the 23 rupees (\$0.18) per liter she used to get when she sold her milk to a middleman, she’s now earning LKR 48 (\$0.37) per liter and is getting 8-10 liters per day from the three cows that are milking.

That farm-gate price will increase to almost LKR 50 (\$0.39) per liter when her cows get a bit older, and can produce the higher fat content milk that fetches an increased price. “I’m very grateful to Land O’Lakes and the people in America who are helping people like me increase our incomes.”

Noting that she’s the “finance minister” in her family, she said her husband did not object when she decided to sell her jewelry to purchase more cows. “My goal for now is to just keep investing whatever money I can into buying more hybrid cattle, and potentially move into sheep and goat rearing before long, too.” ■

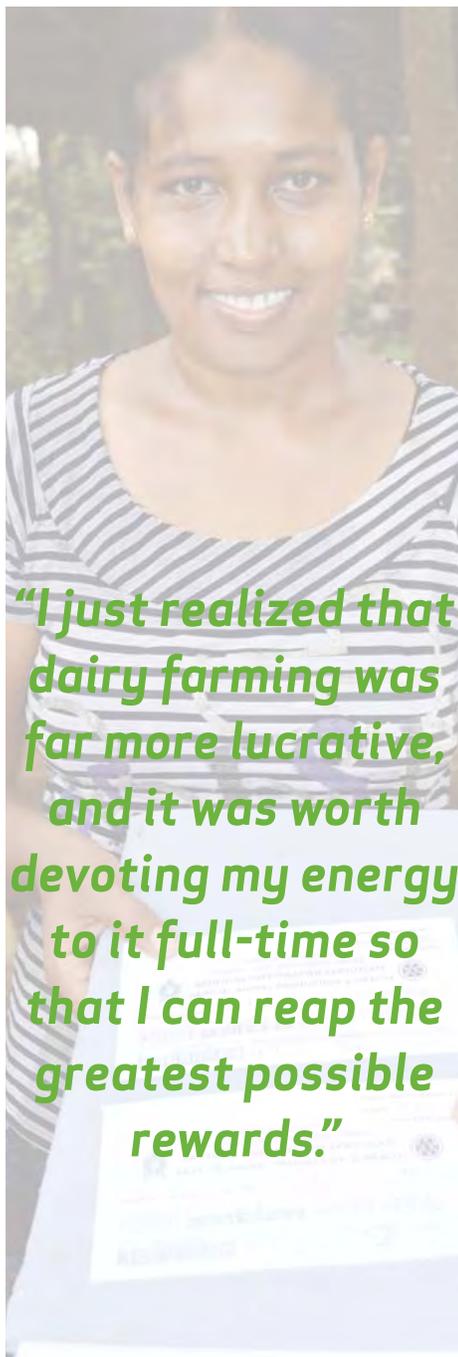
Putting Her All Into Dairy



Chandrika Jayasinghe proudly displays the AI certificates for her cows, who were just inseminated



Chandrika's son helps with feeding one of their calves



“I just realized that dairy farming was far more lucrative, and it was worth devoting my energy to it full-time so that I can reap the greatest possible rewards.”

Two months ago, **Chandrika Jayasinghe** decided it was finally time to close down the small clothing shop she'd managed for over a decade. “I just realized that dairy farming was far more lucrative, and it was worth devoting my energy to it full-time so that I can reap the greatest possible rewards.”

Along with her husband **Ajit Kumara de Silva**, the couple has been increasingly focused on dairy over the past three years, and on improving their breed through artificial insemination. With a 20,000-rupee (\$154) grant from DEEP and her own contribution of LKR 40,000 (\$308), Chandrika was able to obtain her first hybrid animal.

“My first cow was so incredibly productive and would yield up to 15 liters a day. I was so motivated by her output that I decided to sell my unproductive local cows for LKR 60,000 (\$462), which allowed me to buy two more improved breed cows,” Chandrika recalled. Saying she had simply never known about the concept of artificial insemination before DEEP or even of the existence of hybrid breeds, she proudly presented certificates showing that her two new cows had been inseminated the day before our meeting.

Although the couple had purchased a basic cowshed to shelter their local breed cow from the intense heat and rain, they decided to upgrade the structure once they got involved with DEEP and started caring for improved breed cows. With LKR 65,000 (\$501) of their own funds, which was matched by LKR 39,000 (\$300) from the government's Mahaweli project, they were able to purchase a superior cowshed, which provides grazing stalls and a clean channel to catch animal waste.

The couple also purchased a cutting machine, to ensure they could supply their cows with adequate grass, and they're giving their animals four kilos of concentrated feed each day, which is made by the Mahindagama MPG nearby.

Chandrika says she received a wide variety of training through DEEP on feeding, breeding and animal care, the way the program connected her to the local veterinary officer was particularly helpful. She laughed and said, “Now, when I call the vet, he comes immediately, because he knows what good animals I have!” ■

Raising the Roof and Opening Her Home



Sagarika Rasnayake has expanded her home with her milk earnings, and now opens it to the community for a WFP-run feeding program once a month



D.D. Kamalawathie, at right, is now able to afford productivity-enhancing inputs that the MPG deducts from her milk earnings.

When **D.D. Kamalawathie** and **Sagarika Rasnayake**, the current treasurer and president of the **Malinda Pubudu Dairy Farmers Society**, decided to form an MPG in their community through the USAID-funded DEEP project, only four or five people were active dairy farmers. “We all had a few local cows, but very few of us focused on trying to get milk during the war,” recalled Kamalawathie.

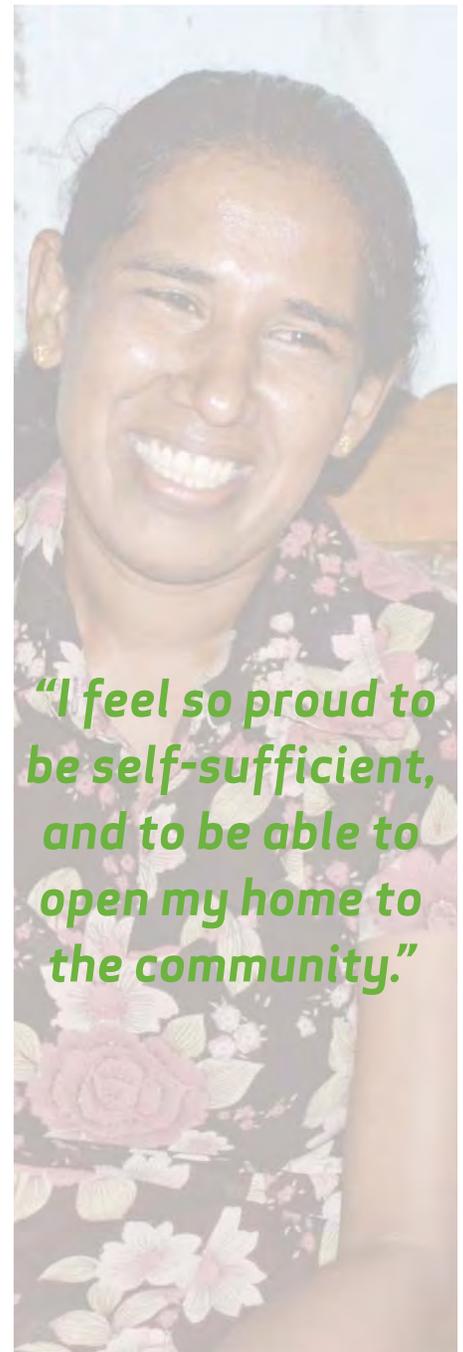
Initially, the women began supplying their milk to another DEEP mini-point nearby. But by persuading their neighbors about what they might achieve by working together through the program, in short order, the women were able to mobilize 43 members, and establish their own mini-point as their volumes grew. So far, 31 of the group’s members have each received grants of LKR 20,000 (\$155) to purchase cattle.

They have also seen a marked improvement in their quality of life from their dairy incomes, which have risen from 12-15 rupees (\$0.09-0.12) per liter to 52 rupees (\$0.40). Sagarika recalled, “Earlier, we never thought about milk prices, and we didn’t have

a regular buyer. Now we don’t have to work through a middleman, and are able to pay for any inputs we need by having them deducted from our milk money.”

While Kamalawathie said she learned about animal husbandry, feed and animal care through DEEP, her most valuable learning was about how to recognize and treat Mastitis. “In the past, I would have sold an animal with this condition, but now I will simply call a vet for treatment.” Also, she no longer lets her animals graze freely, and has instead constructed a cattle shed that has also helped boost productivity.

In terms of the personal impact the program had made on her life, Sagarika pointed out how she had substantially improved the square footage of her home and had even raised the roof, thanks to her dairy earnings. The MPG not only holds its regular meetings in her home, but she also hosts a monthly clinic on her porch that weighs children and provides them with nutritional supplements from the World Food Programme (WFP). “I feel proud to be so self-sufficient, and to be able to open my home to the community,” she said. ■



“I feel so proud to be self-sufficient, and to be able to open my home to the community.”

A Formerly Fractured Community Unites Through Dairy



Thushari Priyadarshani, a Sinhalese, says the program enabled her community to finally come together across ethnic lines



The Welikanda MCC never anticipated their milk tank would reach capacity in less than two months



Mr. Thiruyoganathan, a Tamil, says that the mistrust and suspicion that once pervaded in his community have evaporated

As a result of Sri Lanka's 26-year ethnic conflict, the communities that now comprise the **Welikanda Cooperative Society** used to consist of groups of Sinhalese, Tamils and Muslims who worked in complete isolation from one another, despite living in close proximity and receiving similar government funding through the Mahaweli Development project.

“The biggest change is that all members of the community now work together as if they were the child of the same mother, whether we are Sinhalese, Muslim or Tamil.”

and finances far better. Plus, we're able to access insecticide, pesticide and other things for our paddies from CIC at a wholesale price.”

While the MPG was established a while ago, Welikanda's chilling center only opened on February 9, 2012. While DEEP worked with all beneficiaries, including in Welikanda, to develop business plans for growth, they never anticipated the community would get engaged with dairy so quickly.

When told that if they could have an MCC valued at more than LKR 10 million (US \$90,735) in their community if they started working together across religious and ethnic lines, the residents were up to the challenge and agreed to ensure that their MCC would have a multiethnic Board of Directors.

According to President **P.G. Aberatena**, most of their members are increasing their focus on dairy, since it provides at least 500 rupees (\$3.90) in income per day. “When we are doing paddy work, we'd only get paid every six months. Now that we can get definitive money every 15 days, it helps us plan our lives

According to Center Manager **Mr. Thiruyoganathan**, “When we first opened in February, we were just collecting 1,400 liters per day. In less than two months, we've already nearly reached capacity with the 2,400 liters a day we're receiving. We didn't think this could happen for another year. If we received just five more cans per day, our 2500-liter tank would overflow!”

In terms of dealing with the fact that they've reached maximum capacity so early, the Board is mulling over several ideas until they can access a second chilling tank, including establishing outlets along the main road where they can sell boiled raw milk, or beginning small-scale curd processing.

“I think members will be more focused on quality if they are more connected to the final product that their milk is going towards. I've been working in dairy for over 30 years, but it was only through DEEP that I acquired the skill to look at milk cans and check for quality,” noted Mr. Aberatena.

But despite all of their early success in bulking milk, Center Manager **Thushari Priyadarshani**, a Sinhalese, felt that wasn't the group's greatest achievement. “The biggest change is that all members of the community now work together as if they were the child of the same mother, whether we are Sinhalese, Muslim or Tamil. We came together in a way we never would have before because of DEEP.”

Mr. Thiruyoganathan, who is Tamil, concurred. “During the war we suspected each other and we even didn't smile or speak to each other, although we have been living in neighboring villages. Today, the community is totally cooperating with one another. Because of this, they have lots of assets in areas we never thought possible. And we take pride that we have a chilling facility in our little remote community.”

Feeling “Proud and Strong”



Ms. Nilanthi's life has been transformed in just three months, through her participation with DEEP, with her income going a long way towards supporting her family



A member of Ms. Nilanthi's MCC comes to pick up the milk at her mini-point



Loading the milk in the collection truck

After spending the past four years milking local breeds, **H.L. Nilanthi** never imagined she could see such a transformation in her life in less than three months. But after getting her first crossbreeds with LKR 150,000 (\$1,168) of her own savings and a LKR 20,000 (\$155) grant from the USAID-funded DEEP program in early January, she's already seen a great deal of change.

Ms. Nilanthi currently has four crossbreed cows, including two that are still calves, along with seven local breed cows. While she only gets a maximum of three liters of milk per animal from the local cows, she's getting eight-to-10 liters from the crossbreeds.

“In the past, I would let my local breed cows freely graze. But now I'm getting grass and keeping my animals in the cowshed. Prior to DEEP, I sold my milk to the government-owned processor Milco, which gave me about 35 rupees (\$0.27) per liter,” Ms. Nilanthi explained. “But now that I'm involved with a cooperative and we're connected to DEEP, I immediately started getting 50 rupees (\$0.39) per liter, and Milco increased their price, as well.”

As recently as last year, Ms. Nilanthi says she had difficulty covering her daughter's tuition. But now, her husband's income goes towards family expenses, and she can use her milk money to pay for her daughter's school fees.

Through DEEP, Ms. Nilanthi says she participated in five training modules on AI, feeding, business planning, cattle management, and constructing a cowshed. “Earlier, I was just rearing animals without any real knowledge. Now I know how to determine calving dates in advance, I know what to feed them, I've started cultivating hybrid Napier grass that can withstand drought, and I'm building a second cattle shed, so that I don't have to keep any of my animals in the jungle.”

Ms. Nilanthi has a mini-milk collection point on her land, and she uses a lactometer, and conducts alcohol testing on site. She also collects a separate sample for the MCC to conduct further testing. “Now that my animals are close at hand and I am earning some funds by staffing this mini-point, I am saving tons of time, and can spend more energy focused on my family.” She has two young daughters, and is already dreaming of paying for their college educations.

Through her MPG, Ms. Nilanthi is purchasing feed and mineral supplements for her animals, and has also registered her cows with the veterinary department.

One thing she never expected was the extent to which the 106 members of her cooperative would band together to help each other out beyond pooling their milk. “Many of the parents identified the problem of overcrowding at our local kindergarten. And so we decided to work together in shifts over the course of five days to make the bricks needed to expand the school. I never knew we could achieve so much by working together!” she exclaimed.

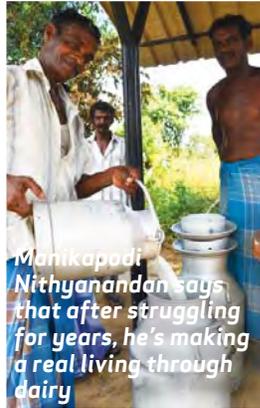
Ms. Nilanthi has also started to exert subtle pressure on her husband that he perhaps switch to doing dairy full-time, too, as his income in the local civil security force is poor. “He helps out, but right now I'm doing the lion's share of the work and my dairy income is covering the majority of our expenses. It makes me feel proud and strong.” ■

“I'm doing the lion's share of the work and my dairy income is covering the majority of our expenses. It makes me feel proud and strong.”

Reviving Livelihoods for Returning Refugees



Mini-point employee **Kandappu Vedhanayakam** stands by as a young girl deposits her milk



Manikapodi Nithyanandan says that after struggling for years, he's making a real living through dairy



MPG President **Thambipodi Vijayaratham** is now also serving as a paravet and agro-input supplier for his neighbors in remote Panchenai

From a distance, it is somewhat hard to imagine how anyone ekes out a living in the remote area of **Panchenai**, where roads pockmarked from wartime battles stymie nearly every mode of transport, with no businesses in sight.

More easily seen are the large “NEHRP” initials on every roof, signifying that their owners were internally displaced from the conflict at least once, and were resettled back on their own land using a cash grant provided by the North East Housing Reconstruction Program to rebuild their homes.

And yet, after some 30 minutes of driving down a bumpy road in seeming desolation, a girl appeared in the distance, riding a bicycle laden with small milk cans that was bound for the mini-milk collection point further down the road. According to **Kandappu Vedhanayakam**, who has gained employment recording quantities and testing the quality of the milk that's delivered, they are collecting about 200 liters per day from 183 members.

By developing a detailed map that outlines collection routes and gets milk to the chilling center on time for daily pick-ups by CIC, even the residents in this remote community of Panchenai have seen an improvement in their livelihoods through DEEP.

“During the dry season, like it is now, life used to be very difficult in these parts. We only had dairy to rely on and we could barely eke out a living from it,” recalled Mr. Vedhanaykam, who is earning 4,000 rupees (\$31) per month to staff the mini-point.

“We didn't always have enough food for the household, and we were always depending on the middleman for money. He would pay us substantially less for our milk than he sold it for,” recalled Mr. Vedhanaykam. In the past, residents would

get 25 rupees (\$0.19) per liter from the middleman. Today, they're being paid at least 47 rupees (\$0.37) per liter, and closer to 50 rupees (\$0.39) when milking from an older cow whose milk has a higher fat content.

Since the low price provided by the middleman was typically insufficient for residents to cover family expenses, Mr. Vedhanaykam said he and others would rely on advance loans from the middleman, which caused them to spiral into a vicious cycle of indebtedness.

Having a small milk collection point close to home and being paid so much more per liter has made a big impact on the lives of residents like **Manikapodi Nithyanandan**, who was at the mini-point to drop off his milk. “When I returned to this place in 2007 after spending six months in a refugee camp, I had to rebuild from nearly nothing. Life was a struggle.”

But as a result of DEEP, Manikapodi is earning a regular stream of up to LKR 14,000 (\$101) a month, with payments coming every two weeks. “Now that I can make a real living through dairy, I've opened up bank accounts for both of my children, purchased health insurance for everyone in the family, and I've even saved 40,000 rupees (\$311). Do you think I'm going to buy a TV with that money? No, I'm buying another cow!”

Meanwhile, MPG president **Thambipodi Vijayaratham** remains close at hand to provide hands-on animal care or veterinary supplies to the community when needed. Trained by Land O'Lakes and his father to be a paravet, DEEP connected him to an agro-input provider in Batticaloa. “I now maintain a stock of veterinary supplies for the community. When someone has an issue, we'll call the vet together to describe the issue. If it's something that can be solved with the supplies I have on hand, I can simply sell those products on demand. ■

Connecting Farmers to Formal Financing



Despite the learning curve for Manmunai West's managers when the center first opened, they are now successfully selling 3,000 liters of milk a day to Nestlé and CIC



Through the financial linkages facilitated by DEEP, Periyathamby Kandalingam was among the 40 members of Manmunai West MCC who were able to secure group loans

Getting a bank loan used to be an impossible dream for dairy farmers like **Periyathamby Kandalingam**. Not considered credit-worthy by formal banking institutions, he and countless other farmers in Sri Lanka's Eastern Province instead relied on getting cash advances with accruing interest from the informal milk collectors, whom they remained beholden to until they could pay off their debts with more milk.

But, through Dairy Enhancement in Eastern Province (DEEP), a USAID-funded program implemented by Land O'Lakes International Development, that paradigm has begun to change for people like Mr. Kandalingam. So far, DEEP farmers have been able to borrow LKR 12 million (US \$108,883) from formal banking institutions.

DEEP advised the dairy farmers to open up individual savings accounts with a formal bank, so that the small grants provided by the program would be credited to their bank accounts, and they could begin on the road of becoming credit-worthy. In many cases, the banks began proactively pursuing more clients in these farming communities, as they began to see more money being credited to these individual accounts, seeking them out to provide loans.

While most DEEP farmers still cannot get secure loans individually, they are able to apply for group loans through their cooperatives. At **Manmunai West**, where Mr. Kandalingam is a member, the MCC is guaranteeing loans through People's Bank for 40 members, including 20 who have already used the funds to purchase a cow.

Manmunai West Livestock Breeders Cooperative (MWLBCS) President **Sinnathamby Kathirkamapodi** freely confesses that he faced a major learning curve when the cooperative's chilling center first opened. Aggregating milk for 1,429 members across 17 MPGs was logistically challenging, and they needed technical training to manage the center, which supplies milk to both CIC and Nestlé.

"We had minimal knowledge when we first started chilling, but Land O'Lakes explained spoilage, and provided a lactometer for quality testing, as well as training on how to test for water adulteration and fat content," recalled Mr. Kathirkamapodi. Even more important for him, he says, was the training he received on forming a cooperative society, including the importance of transparency and keeping immaculate records.

"We wouldn't be able to facilitate these loans for our farmers if we didn't keep our books in total order," Mr. Kathirkamapodi explained. "In order to receive the money, our farmers must submit to the bank a cattle voucher and a health certificate that is issued by the area's Veterinary Surgeon certifying that the cow is in good health. MWLBCS then pays back each loan at the rate of 2,700 rupees (\$21) per month, and we deduct that payment from members' milk money, without charging any interest." After being rejected by People's Bank when he first tried to get financing on his own, Mr. Kandalingam was able to negotiate a bank loan for LKR 80,000 (\$623) through Manmunai West to purchase an improved breed cow.

In addition, through their newfound connection to CIC, those who are also doing paddy farming are now able to access fertilizer and other agricultural input supplies at wholesale prices. Another exciting result of Manmunai West LBCS's new relationship with CIC is that the company has just announced it will provide four of the MCC's farmers with a scholarship of LKR 1.5 million (\$11,680) to learn modern plowing techniques in Thailand, and purchase their own tractor.

The cooperative's amazing success through DEEP continues to amaze Mr. Kathirkamapodi, who says they moved from collecting only 50 liters when they first opened to nearly 3,000 liters a day now. He said, "We have real competition with two buyers, and our members have a sense of excitement about the future." He went on to say, "We never thought this dream could come true – the formation of the MCC, the cooling tank, the vehicles, and so many people with increased incomes. We want to thank the American people and Land O'Lakes for making this all possible." ■

Falling Down and Getting Back Up, For Good



MPG President Pathmanathan Jeyarajah went village to village to convince others to join Aythiyamalai and bulk their milk



Padmarahini Naharajan, the group's treasurer, turned to dairy as a means of survival after her husband's disappearance during the war



“We decided our fate, and none of this would have been possible if we hadn't come together as a cooperative.”

In 2007, **Padmarahini Naharajan** and her husband were displaced from their home due to the intense fighting in their neighborhood. When her husband went missing at the height of the conflict, never to return, she realized she had to persevere, and continue providing for herself and her two children.

Initially, she toiled in the fields, and sold a small amount of milk to a middleman who demanded the price of around 25 rupees (\$0.19) per liter in order to get by, but life was a struggle.

When she and neighbor **Pathmanathan Jeyarajah** learned about the USAID-funded Dairy Enhancement in Eastern Province (DEEP) program implemented by Land O'Lakes in January 2010, they were eager to form an MPG in their area. But, so few people were focused on dairy farming at the time, they were only able to collect seven liters of milk from the entire village at the outset.

Mr. Jeyarajah, now the president of the **Aythiyamalai MPG** recalled, “We took our seven liters of milk and sold it to Nestlé. We then started going around to eight nearby villages that we never

had any real connection with before and worked to mobilize residents by showing the price we were getting. A new village would join, and provide another 10 liters.”

He noted that some people were reticent to join, because they were indebted financially to the middleman, and so it took time to wean everyone off of that support. “There used to be three middlemen in the village, but now we've chased them all away!” laughed Mr. Jeyarajah. Today, Aythiyamalai has 112 members across eight villages, 70 of whom are actively milking.

Although the Sri Lankan government issued a recommendation in March 2011 to set the national price of milk at 50 rupees per liter, it had difficulty enforcing the price increase on the ground. But when DEEP convinced CIC to exceed that farm-gate price by one rupee per liter, it set a competitive price that other buyers, such as Nestlé, had to meet.

“While the government took the initiative to set the nationwide price increase, it was Land O'Lakes that enabled us to come together as a society to sell our milk, demand the price, and move beyond selling to a middleman.



Members of Aythiyamalai MPG feel that the greatest gift was becoming a cooperative, which gave them and other nearby villagers a chance to negotiate a fair price for their milk

We decided our fate, and none of this would have been possible if we hadn't come together as a cooperative," Mr. Jeyarajah insisted.

Since Ms. Naharajan, Aythiyamalai's treasurer, began devoting herself to dairy farming, she's increased her herd from one to six cows through artificial insemination (AI). "I just didn't know about AI before, but now I understand how to improve the quality of my breed. I used to just keep cattle. I didn't know that I could really manage my farm as a business." With her increased income, Ms. Naharajan has begun sending her children to a better school in Batticaloa, she's renting a motorbike for transport, and she's saving money for a better cattle shed.

Meanwhile, Mr. Jeyarajah has become an agro-input dealer for Hayley's Agro Animal Health, which delivers inputs that farmers are able to purchase on credit. Currently selling about 8,000 rupees' (\$62) worth of agro-inputs from his home each month, he calls the agro-input dealer or vet to seek out advice when someone has a problem, and he can provide them with whatever products they need. He said, "These connections were never possible for

us before, nor did we have access to veterinary care before DEEP."

Perhaps even more important than their new connections to veterinary inputs and services, Mr. Jeyarajah has noticed a perceptible change in the cohesion between the Hindu and Christian Tamils in their community. "There's now a real awareness forming across our society, and we're forging a real sense of unity with our new neighbors in the various villages nearby."

Despite the impending culmination of the DEEP program, the group feels confident about their future prospects. "Now that DEEP is over, we are strong and we can run by ourselves. At the outset, we fell down and got up; we fell and then we got up, again and again. Now, we are strong and can stand straight on our own," said Mr. Jeyarajah. "We know the story of Land O'Lakes and how it grew to be so big. One day, we hope to become the Sri Lankan Land O'Lakes!"

He added, "I hope you can come back in another four years, and see the real difference this program has made, when all of our crossbreeds are grown and have replaced all the local breeds!" ■



"Now that DEEP is over, we are strong and we can run by ourselves. At the outset, we fell down and got up; we fell and then we got up, again and again. Now, we are strong and can stand straight on our own,"

For One Woman in Dairy, the Third Time's the Charm



Ms. Diluka was on the verge of quitting dairy when she revived her dairy business through DEEP



Exasperated and at her wit's end, **Ms. Diluka** was so upset about her constant losses in dairy farming that she had nearly given up. In fact, she had just sent five of her remaining cows to live with neighbors when she learned about the USAID-funded DEEP program in 2011.

Hailing from the town of Thasgaswawa, Ms. Diluka started dairy farming in 2005 with about 20 local animals. Like many Sri Lankans, she kept her animals in the jungle, so that they could freely graze there instead of potentially eating up the paddy crops. But, leopards ate eight of her cows in 2006, and several more were killed by disease in 2007.

"I decided to lend five of my cows to neighbors, because they were more of a hassle than they were worth, and I was only getting a meager 18 rupees (\$0.14) per liter for their milk." Ms. Diluka recalled, "It was around that time that I met with a Land O'Lakes mobilizer. When I learned about the phenomenal price increase I could get if I joined the MPG in Thasgaswawa, I got excited."

So, Ms. Diluka brought the five animals back from her neighbors' land, and she invested another 100,000 rupees (\$778), including 20,000 (\$155) from a DEEP small grant, to buy three more high producing animals. She said, "The difference in production between the local breeds and the Jersey crossbreeds was phenomenal. Compared to 1.5 liters per day before, my new improved breed cows produce about 6 liters per day each." Right now, she's earning 15,000 rupees (\$116) per month, but she expects that to rise to 52,800 rupees (\$411) within another year.

"In the past, life was quite difficult for my husband and me, and we worked hard to make ends meet for our large family. And so, I pawned all of my jewelry to buy our land, and we

sold three animals to cover our home's construction," Ms. Diluka explained.

Now, that both she and her husband are focused full-time on dairy, Ms. Diluka says that their earnings are sufficient to cover their day-to-day needs. But, if everything goes according to her business plan, Ms. Diluka believes that in two years, she will not only be able to get her jewelry out of hock, but that her family will be living very comfortably on dairy earnings alone.

"I found the business development planning sessions I attended through DEEP to be particularly helpful, because I learned how to improve my family's income. It was through that process that I realized we'd have enough to live on if I could milk four high-producing animals year-round, and sell a total of 32 liters per day," she said

Through DEEP, she received a wide range of training on animal care and links to veterinary services, which has made a tangible impact on how she now runs her farm. "When I learned about AI, I wondered why I didn't know about this option before. I decided to register my animals with the local veterinary service – something I never would have done for my local breeds. But disease control is particularly important to me now, having lost so many animals in the past."

For Ms. Diluka, another benefit of working with the cooperative is the interaction it has brought with people she otherwise would never have met. She was pleased to report, "Initially, there were only 35 people at the village level who were part of my cooperative, but now six villages with 106 people are taking part. Before DEEP, I didn't really interact with folks from other areas. Now, people are working together and we're building trust and friendships that we never had before." ■

ANNEX D: DEEP Partners and Stakeholder Contact List

Institution	District	Contact Person	Position	Phone/Mobile	E mail
CIC Agribusinesses Leverage Partner	Colombo	Mr. Keerthi Kotagama	CEO	+94112688200	keerthi@cicagri.com
	Colombo	Mr. Waruna Madawanarachchi	CEO, CIC Seeds & DEEP Focal Point	+94777733541	wpm@cicagri.com
	Batticaloa/Punani	Mr. Uditha Dissanayake	GM, Livestock Extension	+94772365909	uditha@cicagri.com
GOSL Partner					
Ministry of Economic Development (MOED)	Colombo	Mr. Nihal Somaweera	Additional Secretary	+94112669096	nihalsomaweera@sltnet.lk
MOED	Colombo	Dr. Sagarika Sumanasekara	Deputy Director, Regional Development	+94718101904	sagarika_sumanasekara@yahoo.com
EPC Officials					
Ministry of Agriculture & Animal Production	Trincomalee	Mr. K. Pathmanathan	Secretary	+94773876364	epmagri@sltnet.lk
Department of Animal Production & Health (DAPH)	Trincomalee	Dr. T.K. Thavarajan	Provincial Director	+94773470874	-
Ministry of Agriculture & Animal Production	Trincomalee	Dr. Gnanasekaram	Director, Planning	+94262222441	-
District Officials	Batticaloa				
District Secretary		Mr.Arumainayaham & Ms. Charles	District Secretary	+94652222235	gabatti@sltnet.lk
DAPH		Ms. Amirthalingam	District Vet Surgeon (DVS)	+94652222397	-
Department of Coop Development		Mr. Kulasegaram	Assistant Commissioner for Cooperative Development (ACCD)	+94652222862	-
Department of Agrarian Development		Mr. Rushanthan	Assistant Commissioner	+94652222471	-
DAPH	Batticaloa Koralaipattu	Dr. (Ms.) Kevapattige	Div. VS	+94716054033	-

	Central DSD				
District Officials	Trincomalee				
DAPH		Dr. Nizamuddeen	DVS	+94779132527	dvstrinco@sltnet.lk
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Department of Coop Development		Ms. Rajini	ACCD	+94774054733	-
District Officials	Polonnaruwa				
Mahaweli Authority of Sri Lanka	System B Welikanda	Mr. Ranjith Perera	Resident Project Manager	+94272259423	-
Divisional Secretariat	Welikanda DSD	Mr. D.K.A. Premalal	Divisional Secretary	+94272259085	-
DAPH		Dr. (MS) Sanjeevani	Div. VS	+94273278237	-
DAPH		Mr. Upananda	Livestock Officer	+94724620857	-
Department of Cooperatives		Mr. Dharmatilaka	Cooperative Inspector	-	-
MCCs					
Manmunai West MCC	MW DSD Batticaloa	Mr. Kathirama Podiyar	President	+94772405676	-
Kawathamunai MCC	Koralaipattu DSD Batticaloa	Mr. Buhary	President	+94774014847	-
Kinniya MCC	Kinniya DSD, Trincomalee	Mr. Musthafa	President	+94778307108	-
Muthuwella MCC	Welikanda, Polonnaruwa	Mr. Abeyrathna	President	+94729526464	-
Semi Governmental					
Milco	EP	Mr. Kanagarajah	Regional Manager	+94776128579	-
Private Sector					-
Hayleys Agro, Animal Health Division	EP	Mr. Riswar Sathar	Sales Promotion Officer	+94773613669	risvar.sathar@gmail.com
Nestle Sri Lanka	Batticaloa	Mr. Balasingham	District Manager	+94772992722	-
NGO					
Kinniya Vision	Trincomalee	Mr. Zaifullah	President/Director	+94773539101	-
Shakthi Foundation	Trincomalee/Kan tale	Ms. Chathurani	Chair Person/Coordinator	+94772321515	shakthichathu@gmail.com
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AECOM/Chemonics	Batti/Polon	Ms. Melony/Mr. Pradeep	COP/DCOP	NA	NA
Financial Institutions					
Bank of Ceylon	Batticaloa	-	Branch Manager	+94652227410	
Bank of Ceylon	Bat. Valaichenai	-	Branch Manager	+94652257708	-
People's Bank	Batticaloa	-	Branch Manager	+94652224480	-
National Savings Bank	Batticaloa	-	Branch Manager	+94652224478	-
SANASA Bank		-	Branch Manager	+94652258044	-
NDB Bank	Polonnaruwa	-	Branch Manager	-	-