



Foreign Agricultural Service,  
United States Department of  
Agriculture



*A MOD model farmer in the Northern Province takes a lead role in promoting MOD's best practices amongst her community of women dairy farmers. She is pictured near the automatic water dispenser installed post-MOD interventions, which ensures 24-hour water availability to the animals.*

# SRI LANKA MARKET-ORIENTED DAIRY PROJECT

## MIDTERM EVALUATION

MAY 2020

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# Midterm Evaluation of the Market-Oriented Dairy Project

Program: Food for Progress

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Implemented by: International Executive Service Corps (IESC)

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## ACRONYMS AND ABBREVIATIONS

|       |                                         |
|-------|-----------------------------------------|
| AIDA  | All Island Dairy Association            |
| BCS   | Body Condition Score                    |
| CLA   | Collaborating, Learning, and Adapting   |
| DF    | Demonstration Farms                     |
| DPC   | Dairy Productivity Categories           |
| EI    | Engagement Index                        |
| EOP   | End of Project                          |
| FAT   | Percent Milk Fat                        |
| FDI   | Foreign Direct Investment               |
| FFPr  | Food for Progress                       |
| FGD   | Focus Group Discussion                  |
| FMD   | Foot and Mouth Disease                  |
| GDP   | Global Dairy Platform                   |
| GM    | General Manager                         |
| GOSL  | Government of Sri Lanka                 |
| HA    | Hectares                                |
| IR    | Intermediate Results                    |
| KII   | Key Informant Qualitative Interviews    |
| KPI   | Key Performance Indicator               |
| l/d   | Liters Per Day                          |
| LDI   | Livestock Development Instructor        |
| LSD   | Large Scale Dairy                       |
| M&E   | Monitoring and Evaluation               |
| MIS   | Management Information System           |
| M&M   | Mentoring and Monitoring                |
| MOD   | Market-Oriented Dairy Project           |
| MOU   | Memorandum of Understanding             |
| MT    | Metric Tons                             |
| N-MOD | Non-MOD                                 |
| OPIC  | Overseas Private Investment Cooperation |
| PAFG  | Participatory Action Farmer Group       |
| PAR   | Participatory Action Research           |
| PMP   | Performance Management Plan             |
| PPI   | Public Private Investments              |
| PPP   | Public Private Partnership              |
| Rs.   | Rupees                                  |
| RSI   | Retail Suppliers of Inputs              |
| SAAP  | Smallholder Agribusiness Partnership    |

|      |                                         |
|------|-----------------------------------------|
| SEAF | Small Enterprise Assistance Fund        |
| SMSD | Small and Medium Scale Dairy            |
| SNF  | Solids-Not-Fat                          |
| SO   | Strategic Objective                     |
| SRL  | Survey Research Lanka                   |
| TOC  | Theory of Change                        |
| TOT  | Training of Trainers                    |
| TMR  | Total Mixed Ration                      |
| UF   | University of Florida                   |
| USD  | United States Dollar                    |
| USDA | United States Department of Agriculture |
| VFM  | Value for Money                         |

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## **EXECUTIVE SUMMARY**

The U.S. Department of Agriculture (USDA), through Food for Progress (FFPr), funds the Market-Oriented Dairy (MOD) project in Sri Lanka. The project has two main objectives: increase the quantity and value of milk produced and improve the trade in safe and high quality milk. MOD has six activities to accomplish these objectives: increase capacity of extension services, increase the supply of inputs to dairy farmers, increase the access to finance, improve the market linkages between buyers and sellers, improve the quality and safety of milk produced, and create and strengthen the dairy association to better serve the interests of all stakeholders.

The project is at its mid-point of its 5-year project life, and the USDA requires an evaluation to assess if the project is on track to meet its targets and whether any mid-course corrective actions are needed in the time remaining. The evaluation team engaged MOD stakeholders using Participatory Action Research (PAR) to understand the activities, outputs, outcomes and impacts of MOD's interventions. The team worked closely with MOD staff to ensure that data collected was useful to them. There were 59 key informant interviews (KIIs) and one focus group discussion (FGD) conducted with stakeholders, and the data analyzed using Atlas.ti software. Enumerators interviewed 211 dairy producers, of which 186 were MOD dairy farmers and 31 were dairy producers but not currently participating in MOD's intervention). The 31 N-MOD producers were registered to enter as MOD participants in the future, and they served as a counterfactual group.

### **Events Impacting MOD**

Starting in 2017, conditions changed rapidly from what was in the project design. MOD's funding was delayed until late in the first year (2018) because of delays in monetization of U.S. commodities. The macroeconomic situation in Sri Lanka began to change with growth of gross domestic product falling in the first three years from over 4 percent to under 3 percent and a currency devaluation of 30 percent (Rs.150 to Rs.180 per USD). The agricultural sector experienced a continued drought which reduced forage production – the main feed ingredient. Areas in the Northwest Province experienced floods and loss of livestock. In 2019/2020, an outbreak of army worms in the maize crop affected planned silage production, and in the Northwest Province and parts of the North Central Province an outbreak of foot and mouth disease (FMD) closed the area to MOD activities, milk production declined, and processors reported decreases of 20 percent – 25 percent in milk supplies. Some of these occurrences are symptoms of climate change with drought and flooding in the same year. In 2019, a terrorist attack set back interest by investors on the foreign direct investments (FDI) expected for the dairy sector. Finally, the Government of Sri Lanka (GOSL) and the United States Government (USG) were to sign a Memorandum of Understanding (MOU) agreeing to collaborate on MOD activities. However, the MOU has not been signed partly because of the changes in political rule in the country and the upcoming parliamentary elections scheduled for the summer. During the evaluation, the entire

country is in a shelter-in-place policy since March 2020 to counter the spread of the COVID-19 virus.

### **Volume, Value and Milk Quality**

Notwithstanding these extraordinary events, MOD maneuvered adeptly to carry out its planned activities. MOD has three main objectives: increase the volume of milk entering the formal market channel, increase the value of milk sales, and improve the quality of milk.

**Volume of milk production.** The annual increases in milk production by MOD farmers is falling below the projection made at the baseline. The estimate for the end of project target of 87,820 MT was too high, in part because processors were solely responsible for nominating producers achieving 39.6 l/d for a 180 day lactation at the baseline. Processor interviews and government data at the baseline indicated there were sufficient numbers of producers plus large scale dairies (LSDs). The contrary has rather been true, and processors have asked to lower the requirement to now include those producing below 25 l/d. The number of LSDs have fallen because of bankruptcies. In addition, volume of milk produced by MOD farmers started off slow because of the delay in funding in project Year-1 and conditions described above affected Year-2 production. However, production in the first six-month period of Year-3 improved (32,107 Metric Tons (MT)) and milk production is on track to exceed Year-2 totals (41,543 MT). It is not certain that MOD will meet the end of project (EOP) annual total of 87,820 MT, and the target volume will need to be lowered. Processors could have indicated 20 l/d which would have been closer to the actual situation at the baseline.

**Value of milk sales.** Producers are receiving higher prices because processors are paying more for milk because of the shortages of available milk and rising consumer demand for fresh milk products. In the first six-month period of Year 3, the value reported was USD \$17 million. The value of the formal milk sales from MOD producers will likely meet the target of USD \$35.2 million by the EOP.

**Milk quality.** In the producer surveys conducted by the evaluation team, producers reported that percent milk fat (FAT) and solids-not-fat (SNF) values in their milk increased because of MOD's interventions. Processors do not pay producers on quality but only on FAT and percent SNF in the milk. In this regard, MOD is achieving its goal of higher prices based on higher FAT and SNF values. However, experts agree that Sri Lankan milk is not up to international standards which presents challenges for modernization of the industry. Starting at the farm and throughout the supply chain, the infrastructure is not adequate to protect milk quality measured in low bacteria and somatic cell counts. More infrastructure investments in cooling are needed. With the recent decline in supplies, processors focused on procuring all available milk and were willing to take poor quality milk and did not reject milk because of the scarcity at the time. The baseline evaluation report determined that the proposed indicator to "reduce the rejection rate of producers' milk by 80%" was not a relevant indicator in improving quality. Milk rejection rates were low then, and they are even lower now, because of the decline in milk supply. The USDA indicator was changed to "percent of beneficiary farmers earning higher prices than before the start of the project intervention, due to improved milk quality." Higher prices are paid to producers based on

FAT and SNF (components in the milk) and not based on the quality measure in bacterial and somatic cell count. In addition, there has been a general increase in prices paid by the GOSL and because processors are facing a supply shortage.

Processors have fallen into poaching the supplies of other processors' dedicated producers until recently, instead of working with MOD staff to develop the capacity of dairy farmers or collecting evening milk. This practice has lessened recently with increased supplies of milk; however, MOD will need to address how in the time remaining in the project it plans to confront the milk quality issue and move Sri Lankan milk closer to international standards. This is a major challenge for the MOD team, especially when the processors do not believe this is a high priority at this time.

### **MOD's High Achievements**

MOD has accomplished a number of milestones set out in the Performance Management Plan (PMP). In some cases they have already met and exceeded EOP targets. It is worth noting some of the important achievements that will have a lasting impact on the dairy sector.

**Memorandum of Understanding (MOU).** MOD has been active in obtaining 24 MOUs with public and private sector organizations. These MOUs afford MOD's senior staff to form relationships and have access to chief executives of key companies and government departments. MOD has a business philosophy that it engages in dialogue and negotiations with stakeholders in an open and transparent approach. This means that MOD is not a "one and done" project when the project ends, but it will have sustainable impacts long after the project ends because of the stakeholders nurtured in the private sector. There is evidence already that processors have bought fully into the MOD philosophy of training.

**All Island Dairy Association (AIDA).** MOD and its consultants have engaged with the dairy association to build its capacity to now having a general manager (GM) in place and 21 paying members who represent key industries and companies. AIDA is a self-governing body and not influenced by the GOSL, although its representatives are invited to meetings. AIDA, with assistance from MOD consultants, developed a 3-Year Strategic Plan, Action Plan, and a charter for the organization. It held knowledge forums for members and non-members, and it prepared a draft policy paper on recognizing fodder as a crop. MOD's partner, Global Dairy Platform (GDP), is assisting AIDA in its development.

**Training.** MOD's training program is the lynch pin to delivering MOD's resources and achieving long-term impacts on the dairy industry. MOD conducted training of trainers (TOT) for government and processor field extensionists in four modules. These trainings are composed of technical and business modules. Department of Animal Health and Production (DAHP) officials said that MOD was providing a valuable service to its livestock development officers (LDOs) and its instructors (LDIs) and artificial inseminators (AIs). A CEO of a processing company remarked that, ***"MOD's training is not the orthodox type of training that has been done for decades but it offers a fresh approach starting with a short training and then carries on into "mentoring and monitoring" of the producer."*** MOD staff work with individual producers, input suppliers and cultivators to meet targets in an individual's action plan. In field interviews, respondents were very satisfied with the assistance provided by the MOD team.

## Challenges Faced by MOD

**Producers with less than 40 l/d for 180 day lactation.** The number of producers achieving 40 l/d is lower than the baseline estimate so reaching the target volume of 87,820 MT will present a challenge. As seen in Table E.S.1, the majority of MOD producers interviewed by the evaluation team produce less than 25 l/d. MOD can include the 25 – 40 l/d producer which will increase producer numbers but milk production targets will not be reached. MOD can create a class of producers who are in MOD, but they will need to get over 30 l/d to receive the full-package of MOD interventions, e.g. assistance with financial services, etc. These lower production producers could be near a demonstration farm (DF) and able to see good dairy practices.

**Table E.S. 1: Current Milk Production**

|                    | MOD        | %     | NMOD      | %     |
|--------------------|------------|-------|-----------|-------|
| <25 liters/day     | 133        | 71.9% | 22        | 71.0% |
| 25 - 40 liters/day | 30         | 16.2% | 4         | 12.9% |
| 40 - 60 liters/day | 13         | 7.0%  | 3         | 9.7%  |
| >=60 liters/day    | 9          | 4.9%  | 2         | 6.5%  |
|                    | <b>185</b> |       | <b>31</b> |       |

**Access to finance for dairy farmers.** Dairy farmers face difficulties in obtaining loans. Banks experienced high rates of defaults loans to purchase the New Zealand/Australian dairy cattle. Banks soured on loans to dairy farmers. Low interest rates that were offered by banks at the start of MOD are not available at this time. Other problems faced are the time from a producer's first enquiry with a bank loan officer to receiving the funds can take many months. Banks want to hedge their risks and will request a guarantor for the loan. Bank loan officers are not familiar with dairy enterprises, so this increases the time of applications. MOD understands the situation and now does more work with SAPP and banks to procure loans for farmers. Banks are more prone to lend when a processor is supporting the farmer and paying off the loan with the milk check. MOD can help banks to identify those producers who are likely to qualify for loans and can assign a MOD business trainer to assist the producer in necessary steps to final acceptance. The business trainer can enter into a contract to be paid as milestones are achieved in obtaining the loan with the largest share of fee paid on the back-end. In some cases, producers have debt obligation with banks and the business trainer can help with a work-out on the outstanding loans.

**Achieving economies of size of a Large Scale Dairy (LSD).** At the start of the project, there were over 60 LSD that were in the initiation stage of development. These large enterprises would create the opportunity for large volumes of milk and at lower cost of production because of larger volumes of milk produced. Cross-bred dairy cows were imported, and it soon became apparent there was the lack of feed and management skills for these large dairies. Farms defaulted on their loans, and banks incurred losses. Banks came to view all dairy enterprises as high risk investments. MOD assists a few of the remaining LSDs with hands-on-training of farm staff. The LSD model is suitable in the higher elevations of the Central Province. LSDs would benefit from regular visits by an experienced dairy nutritionist who can assess body condition score (BCS) and then advise on an appropriate Total Mixed Rations (TMR) using available feedstuffs.

## **IESC and MOD Performance in Fulfilling FFPr Mandate**

USDA's mandate is for the FFPr to support the expansion of private enterprises in the agricultural sector. This is the overall benchmark by which to judge the performance of IESC and the MOD. The evaluation team addressed several questions relevant to this benchmark.

**Is IESC implementing MOD in line with their agreement?** The creation of a strong private dairy industry will have a long-lasting impact after MOD concludes. IESC put forth an ambitious program to address weakness throughout the dairy value chain in Sri Lanka. All segments of the value chain are being addressed with varying levels of effort and success. Overall, IESC's efforts to increase production and productivity by small and medium size dairy (SMSD) producers and large scale dairy (LSDs) is in line with expectations for expansion of the dairy production base. The collaboration with eleven dairy processors is a key component in the formal dairy value chain. The expansion in the domestic trade for milk is occurring according to the terms of the agreement, but not to the rate proposed for a number of reasons outside the control of IESC and its implementing team. These events include weather, disease, political, terrorism and a pandemic.

**Are MOD interventions appropriate?** MOD's interventions are appropriate in building the private sector's capacity to take the lead in development of a modern dairy industry. Besides working one-on-one with processors, MOD assists the industry's All Island Dairy Association to help the industry address challenges requiring participation among members and with the government agencies. MOD works with the government's Ministry of Agriculture and the Department of Animal Health and Production (DAPH) to strengthen their capacity to facilitate the private sector development. However, the GOSL has a legacy of putting up obstacles for free markets approach in land, water, and services (artificial insemination and health services) that crowds out the more cost efficient private sector. MOD staff struggle with this challenge, and it is apparent because the GOSL delays signing a MOU with the USG.

**Are MOD interventions achieving project goals and objectives?** MOD is seeing the industry respond to its initiatives to create a market-oriented dairy sector. Dairy producers said in interviews that MOD trainings are impacting their profitability and producers are adopting practices and slowly investing in the operations. The volume of milk is increasing but not at the rate projected because of the lack of producers producing at 40 l/d. MOD may want to ask for a reduction in volume to around 70,000 MT at the end of project (EOP). Value of milk sales reported by processors has increased and will likely meet its target of US\$ 35.2 million by the (EOP). Producers are paid on FAT and SNF (milk components for which a producer is paid). Based on field interviews, milk quality as measure in FAT and SNF is improving for producers who adopt MOD's 10 Best Practices. MOD can work with milk processors to address the milk quality expressed in low somatic cell and bacteria counts.

**Is IESC managing the project and technical approach professionally, ethically, and effectively?** Several executives at dairy processing companies said that the MOD staff were very professional and showed a sincere interest in ensuring that their producers and staff benefited from trainings. The efforts that MOD staff make to follow-up with producers is unique and proving to

be effective having tangible results. MOD staff mentioned that they take particular effort that producers supplying different processors are not in the same training. This provides a sense of trust between the processor and the producers.

**Recommendations for mid-course corrections.** The evaluation team finds that MOD has an ambitious set of activities, and a few of these are in the start-up phase. Ten recommendations are presented for consideration by MOD staff that would further enrich the accomplishments made by MOD. These recommendations are explained in more detail in Chapter 10.

**Rec. #1. Small and Medium-Scale Dairy (SMSD).** Continue to focus on the dairy enterprises of 30 to 40 l/d and above to boost their production to 80 to 100 l/d. MOD needs to expand its DFs from approximately 40 to 100 DFs by the end of Year-4. The reason for more DFs is that they are located closer to clusters of producers so that farmers (direct and indirect beneficiaries can have easy access. We found examples where a DF farmer is helping a N-MOD farmer grow forage near his farm. This reduces the amount of travel time and cost by MOD's regional staff to better focus on these clusters. With more training at DFs (instead of in classrooms), MOD can push more interventions directly to the field and producers. There are opportunities for practical materials like videos to be shown at DFs. It is advisable to work more closely with processors to increase the volumes of milk from existing SMSDs. MOD can also assist processors planning to establish model dairies that are producing 25 l/d or less. MOD can provide guidance to processors' field agents, but MOD should expect that the processors will take full responsibility for these smallholder producers with their model farmers.

**Rec. #2. Large-Scale Dairy (LSD).** MOD currently works with 14 LSDs. Other LSDs can be brought into MOD's sphere of influence. The recommendation by the professors at the University of Florida (UF), which is an implementing partner of the MOD project, is that MOD needs to concentrate on these LSDs because of the potential for more milk production. The quality of the milk is higher because some LSDs have coolers, produce large volumes and have direct collection at their farm. Some of these producers are paid over Rs.100/l for their milk. LSDs need a dairy nutritionist to visit their farms regularly to monitor feed rations and conditions of the animals. MOD would contract a dairy nutritionist from the region who visits LSDs on a regular basis for consults on dairy rations and herd conditions.

**Rec. #3. Up-stream retail suppliers of inputs (RSIs) and services to dairy producers.** MOD continues to support entrepreneurs that link to producers with quality input supplies. RSIs include field agents, breeders, seed suppliers, machinery and equipment, veterinarians, artificial inseminators, forage cultivators, silage makers, and retailers of chemicals and fertilizers. MOD continues to monitor the market demand for these products to ensure that supply matches demand. MOD continues to promote RSIs at dairy producer gatherings and at DFs). Processors need for these RSIs to function so that dairy farmers have access to quality inputs.

**Rec.#4. Improved milk quality in the supply chain.** MOD needs to work with all stakeholders to improve the quality of milk entering the formal market channel from the cow to the processing plant. Processors need to make more investments in cold chain. Cow comfort/care, shed design,

and good hygiene practices are necessary for improved milk quality. Places for contamination are at the shed, use of plastic cans, and mixing evening milk with next morning fresh milk. More on-farm testing of milk, which is done by only a few processors, can be increased. MOD can work with processors on pilot programs to collect evening milk. In field interviews, a majority of women mentioned willingness to collect and delivery evening milk.

**Rec.#5. Access to finance for dairy enterprises.** MOD is providing financial training to producers and meeting its projected targets. However, banks and their loan offices are not making loans to dairy farmers. MOD needs to develop training programs for loan officers and inject other interventions with the four banks that signed MOUs to educate and facilitate loan making. Loan officers need to be properly trained and exposed to the business of dairy enterprise. In an interview, a bank executive said he plans to have loan officers undergo a training program in lending to dairy farmers. MOD can assist with these trainings and arrange for loan officers to visit producers and DFs.

**Rec.#6. Dairy School for Young Dairy Farmers.** The dairy industry faces a shortage of young men and women willing to own and to operate commercial dairy operations. MOD needs to work with processors to create a pathway to ownership. Several processors discussed a program for establishing model farmers. This program could be a public-private partnership (PPP) between a local university and processors. MOD can provide specific training materials and facilitate this PPP between processors and the university and a dairy school or program in the US. MOD can support AIDA to consider the feasibility of this program, and MOD can have a volunteer who knows the US program to advise on the program.

**Rec.#7. Value Added Dairy Products.** MOD can provide greater support to small-scale dairy initiatives supporting producer groups that are processing local products, e.g. toffee, ghee, yoghurt, and other indigenous food products. ACTED and the Small-Scale Agribusiness Project Program (SAPP) are supporting these efforts. These projects are women-focused and offer small business opportunities for income generation and improved nutrition in the use of dairy products. MOD can assist with training in good dairy management, as it is currently doing.

**Rec.#8. Expand AIDA Initiatives.** MOD achieved success in establishing AIDA as the voice of the Sri Lanka dairy industry. AIDA would benefit from more frequent visits by the MOD consultants of the Global Dairy Platform (GDP) to work with the general manager (GM) and the steering committees. AIDA needs to encourage company executives to engage their mid-level staff in working committees. AIDA can lead in developing milk standards for the industry and engaging the Government of Sri Lanka (GOSL) in needed regulations and oversight. One segment of the sector not represented directly are milk producers, and MOD and AIDA can look at ways to expand their membership in AIDA.

**Rec.#9. Analytics of MOD’s “10 Best Practices.”** The evaluation found that MOD’s 10 best practices being promoted to dairy farmers have a positive effect on milk production, and levels of SNF and FAT in the milk. MOD contracts with Survey Research Lanka (SRL) to conduct field surveys and collect data to report on USDA indicators. MOD, working with SRL, can further examine the Wave data to better predict the likelihood of a producer’s dairy herd achieving better performance by adopting MOD’s best 10 practices. SRL can merge processors’ data on volumes, prices, FAT and SNF with Wave producer survey data to analyze herd performance over time. The analysis would better identify those producers who would be good credit risks for applying for loans for their dairy operations.

**Rec.#10. Support for fodder and forage Production research and extension.** MOD recognizes feed as a major constraint to dairy production. Though it does not have a research mandate, MOD can collaborate with the Ministry of Agriculture and its relevant departments for innovative solutions to overcome the complex constraints faced by the Sri Lankan dairy producers in forage-fodder production. This recommendation would support the need to address forage and fodder constraints which vary by agro-ecological zones. The competitiveness of dairy in Sri Lanka needs to be a forage-based system, and MOD can support applied research to address feed for dairy cows.

## **1. BACKGROUND AND OVERVIEW**

### **1.1. Purpose and Design of the Evaluation**

The MOD project is at its mid-point of its 5-year project life, and the USDA requires an evaluation to assess if the project is on track to meet its targets and whether any mid-course corrective actions are needed in the time remaining. The evaluation team engaged MOD stakeholders in a participatory process (using PAR to understand the activities, outputs, outcomes and impacts of MOD's interventions). The team worked closely with MOD staff to ensure that data collected leads to useful findings that can be implemented. The evaluation team draws on tools such as outcome harvesting, which focuses on identification of outcomes of the project and then through the PAR approach identifies those activities which best impact those outcomes. The aim is to assess activities and their outputs as to their relevance, effectiveness, and sustainability and if they will lead to meaningful outcomes.

The evaluation design is mixed methods of quantitative and qualitative surveys to gather information. The team reviewed MOD's semi-annual reports and other documents, such as the PMP, Results Framework, Theory of Change (TOC), monitoring and evaluation plan, assessments by consultants, and the databases of Wave\_1 and Wave\_2 producer surveys. The evaluation team conducted 216 producer surveys to compare with data collected by MOD during standard monitoring and evaluation processes. Surveys included both MOD and N-MOD producers and were both face-to-face and telephone interviews. Through the literature review and subsequent discussions with MOD project team, the evaluation team identified key informants to be interviewed to gather relevant information. From the list, qualitative surveys were conducted of 59 beneficiaries, stakeholders, and implementing partners. A focus group of MOD producers was conducted in the Northern Province. Interviews were both face-to-face and Skype/phone calls. The transcripts of the interviews were coded and analyzed using Atlas.ti, a computer assisted software program. The evaluation team sought confirmation of our observations through a series of steering committee interviews with MOD staff and its partners to triangulate that the observations were in fact accurate and relevant. The MOD staff held a workshop on March 9th and 10th before the team's departure to the field. The evaluation questionnaires were refined and agreed upon during those sessions. The Project Director explained MOD activities in a PowerPoint presentation. On the field trip, the enumerators piloted questionnaires in Poonewa area on the border between North Central and Northern Provinces. In the field interviews, the team observed producers' operations and assessed interventions and practices. Photographs were taken of dairy operations (with approval of producers) to record what was being observed. Mobile data collection client, ODK Collect, was used to collect quantitative data from MOD and N-MOD producers. The field data collection was cut short on March 20th because the GOSL imposed a nation-wide curfew as a measure to control the spread of COVID-19 pandemic. Telephone or Skype interviews were then conducted from March 30th to April 2nd. Data analysis began on April 20th and ended on April

30th. The draft report was submitted to IESC for first review on May 6th and the revised draft sent to USDA on May 15th.

## **1.2. Dairy Situation**

Sri Lanka has a variety of agro-ecological zones of highland and lowland areas with different production systems for each climatic condition. There are 125,294 registered dairy farms with European crossed cattle in Sri Lanka.<sup>1</sup> The consumption of dairy products has been increasing over time and is now approximately 53 liters per capita. Sri Lanka is now approximately 40% self-sufficient in milk consumption (see Table 1.1.), though there is variation in supplies from year-to-year because of external factors, like drought. Dairy and agriculture are complementary enterprises with synergies in the sharing of crop by-products and organic fertilizer. With greater intensification because of population growth and the impacts of climate change on agriculture, agricultural producers have transitioned to becoming more reliant on dairy production.

## **1.3. Strategic Objectives and Results Framework**

The USDA’S Food for Progress (FFPr) program is funding the MOD project. It has two strategic objectives (SOs): SO1: increase agricultural productivity, and SO2: expanded trade of agricultural products. SO1 has three intermediate results (IRs) and their respective sub-IRs which will lead to an increase in agricultural productivity. MOD has faced challenges with FFPr1.2.3. “Increased Use of Financial Services” which has a “knock-on” effect on FFPr1.2.2. “Improved Infrastructure to Support On-Farm Production”, and on FFPr1.2. “Increase Use of Improved Agriculture Techniques and Technologies.”

In SO2, MOD expands trade benefits from its close relationship with the formal dairy processing industry. Producers can be confident that their increased production achieved in SO1 will be purchased by dairy processors at a fair price. This factor reduces risk that producers of a generic commodity face when selling in the informal, cash market. MOD faces a challenge in the impacting FFPr2.1.1.1. “Increased Adoption of Established Standards by the Industry.” For a number of reasons, the processing industry shows little interest in agreeing on industry standards for quality. The industry pays on FAT and SNF formulation, and there is no premium paid for meeting quality standards, e.g. somatic cell and bacteria counts. The industry is reluctant to address quality standards which has a follow-on effect on improved quality of post-production agricultural products (FFPr 2.1.1.). MOD faces a challenge to increase the use of financial services (FFPr2.2.3.1.). MOD does not give grants to dairy producers and processors but rather supports them to obtain loans from financial institutions. For a variety of reasons, banks have not made loans to MOD beneficiaries as expected, and dairy enterprises have not made the necessary investments to improve needed post-harvest infrastructure (FFPr2.1.2.2.).

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<sup>1</sup> Daniels, S. and G. Sullivan. (2018). “Evaluation of baseline estimates of the Market-Oriented Dairy (MOD) project.” US Department of Agriculture and IESC, Washington, D.C.

## **1.4. Theory of Change (TOC)**

MOD's TOC is based on the premise that a market-driven approach is necessary for a modernized dairy industry. All stakeholders in the dairy value chain will benefit from input providers (products, services), commercial producers (small, medium, large), collectors, processors, wholesalers, and retailers acting in the private sector. MOD's TOC is predicated on two suppositions: first, interventions by MOD will lead to increased investments in dairy inputs, which will lead to increased production of quality, safe milk; and secondly, that consumer awareness about quality of fresh dairy products will result in an increase in the formal trade of milk and milk products.

The quality issue for milk is not manifested in the market because there is no certification, regulations, or oversight by the GOSL. Furthermore, no feedback mechanism exists from consumer awareness about quality of fresh milk – only that consumers prefer fresh milk over reconstituted, imported powder milk. At the present time, the dairy industry does not set quality standards, and dairy processors have a low rejection rate of producers' milk because of the supply shortage of fresh milk. The baseline evaluation found that this was not an issue, and still remains a non-issue for processors. The market situation in Sri Lanka for dairy products has changed over the course of the project. Two things are working to increase producer prices: (1) MOD's interventions for those producers who adopt best practices (e.g. cows being fed a nutritious diet) are seeing an increase in their FAT% and SNF% which is the basis for how processors pay producers, and (2) the producer price for milk has increase because of the shortage of milk (e.g. processors poaching supplies from competitors' supply chain), even when the quality is not up to standards with high bacteria, high somatic cell count and possible adulteration.

MOD has six activities linked to the needs, challenges, and opportunities described in the strategic analysis, which is guided by evidence to support what has worked, what has not been working, and what is needed to be done to achieve the intended results. These activities cover the needs of the dairy industry, though the emphasis varies based on priority from the industry and level of funds available for MOD to conduct these activities.

## **1.5. Baseline Report**

The mid-term evaluation looks back at the period of the baseline report, and the current situation is much different. The baseline report was done at a time of normalcy and renewed optimism.<sup>2</sup> The dairy industry was vibrant with a large program to import dairy cattle from New Zealand and Australia to jump-start the industry. Bank loans were available to finance these operations. The expectations were high and so were the target indicators for MOD. The baseline report focused on

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<sup>2</sup> Daniel, S. and G. Sullivan. (2018). Evaluation of baseline estimates of the Market-Oriented Dairy (MOD) Project." IESC and US Department of Agriculture. Washington, D.C.

three indicators seen as important to the success of the MOD project: volume of milk, value of milk, and quality of milk. Since the baseline report was completed, economic and political changes have occurred which impact the three key indicators.

#### **1.5.1. Volume of milk**

The target number of producers at the end of the project is 5,400 producers in six provinces. The baseline report estimated the quantity of milk for the MOD project beneficiaries at 38,525 MT and the target at the end of project is 87,820 MT. The volume was projected for producers averaging 39.6 l/d for a 180 day lactation. At the mid-point of the project, MOD has identified 4,940 farmers and has engaged in providing training and other services to 3,097 producers, which is 57 percent of the target over the life of the project.

MOD is struggling to identify sufficient numbers of producers that meet the 39.6 l/d production set in the baseline report. This is a major reason the volume is below the projected estimate. Another factor is that drought and floods affected production; in addition, there have been FMD and army worms in the maize and sorghum crops. There were other disruptions because of a delay in receiving funding from monetization, political elections, and terrorist attacks. The milk production and import table shows that domestic production dropped 4.3% according to the provisional data for 2019 (see Table 1.1.), confirming the severity of the production situation in 2019. It should be noted that production is expected to rebound in 2020 because of better weather; however, the human health pandemic may have negative effects on mobility of milk and inputs to farms.

#### **1.5.2. Value of milk sales**

The baseline estimate for value of sales from commercial dairy producers was set at a lower amount, \$15,427,539, than was proposed in the project design document of US \$21,900,000. The revised sales in Year 2 was projected at \$20,362,693. The actual sale revenue in Year 2 was \$17,786,887. The short fall in milk production, as noted above, was offset by the increase in the farm-level price.

#### **1.5.3. Quality of milk**

The baseline report found that the rejection rate by processors was low and not an indicator that would signal an improvement in quality of milk. The recommendation was for the industry to agree on a standardized test for quality and that processors test producers' milk. This recommendation did not meet with industry approval, and MOD staff chose to modify the indicator to be based on producers receiving higher prices for their milk because of improved FAT and SNF of the milk from better feeding. The target for Year 2 is that 20% of the producers would receive a higher

price for their milk. By the end of the project, 80% of producers would receive a higher price for their milk because of improved quality compared to the baseline. The problem is that the industry needs to move to international milk standards, but the way this indicator reads it does not achieve this purpose. This is confounded partly because the GOSL raised the price for producers' milk based on the formula for FAT and SNF. With better feed rations, producers will receive a better price for their milk, because of increased FAT and SNF but not necessarily due to improvements in quality of the milk due to lower bacteria and somatic cell counts.

## **1.6. Dairy Statistics**

GOSL dairy statistics for 2018 and 2019 (preliminary) illustrate the volatility in domestic milk production. After a steady increase in domestic milk production, production declined 4.30% in 2019 compared to 2018 because of weather, disease, and failure of mega farms to provide sufficient feed and proper animal husbandry. Imports decreased, and processors experienced shortages of milk for processing. Processors bid up the farm price for milk.

**Table 1.1. Quantity of milk production and milk imports (liquid milk equivalent) from 2015 to 2019**

|                                                                       | 2015          | 2016          | 2017          | 2018          | 2019(p)       | Percentage Change<br>(2018 to 2019) |
|-----------------------------------------------------------------------|---------------|---------------|---------------|---------------|---------------|-------------------------------------|
| Cow Milk<br>(liters)                                                  | 311,341,320   | 306,142,447   | 329,011,951   | 391,530,600   | 374,015,943   | - 4.47%                             |
| Buffalo Milk<br>(liters)                                              | 71,122,680    | 61,050,139    | 68,903,569    | 76,160,664    | 73,566,360    | - 3.41%                             |
| Total Domestic<br>Production<br>(liters)                              | 382,464,000   | 367,192,586   | 397,915,520   | 467,691,264   | 447,582,303   | - 4.30 %                            |
| Total Dairy<br>Imports<br>(LME) (liters)<br>(1)                       | 631,602,120   | 727,745,700   | 723,867,690   | 725,295,921   | 686,583,373   | - 5.34 %                            |
| Total Milk<br>Consumed in<br>SLK (liters)                             | 1,034,832,480 | 1,182,373,841 | 1,121,783,210 | 1,192,987,185 | 1,134,165,676 | - 4.93 %                            |
| Domestic<br>Production as<br>Percent of<br>Milk<br>Consumption<br>(%) | 39%           | 38.5%         | 35.5%         | 39.2%         | 39.5%         | + .3 %                              |

Note 1. LME is liquid milk equivalent (number of liters of milk to produce one kg of powder) Source: Department of Animal Production and Health, 2015 and 2016

Note 2. No data is available on imports for 2018 and 2019 and domestic production estimates for 2019 are provisional.

<http://www.statistics.gov.lk/agriculture/Livestock/MilkProduction.html>

## **2. MOD's DATA COLLECTION SYSTEM AND EVALUATION METHODOLOGY AND DATA COLLECTION**

This chapter summarizes MOD's monitoring and evaluation (M&E) system used to collect data. The M&E team in MOD provided an explanation of their data collection methods and tools. The evaluation team developed its separate methodology for collection of data and analysis of the findings.

### **2.1. MOD's Data Collection Systems**

The MOD program has a system of data collection practices and methodologies to meet USDA's periodic reporting requirements. There are 22 MOD program performance indicators with set annual targets, and MOD reports on each of them every six months. Data are collected from various sources and using different methodologies. MOD contracted a local company (SRL) to custom-build a management information system (MIS). MOD maintains databases with two data entry operators, and hard copies are mainly held at the head office in Colombo.

#### **2.1.1. Wave\_1 and Wave\_2 Surveys**

MOD conducts surveys every six months to report to USDA on the 22 indicators. MOD contracted SRL to conduct periodic field surveys (*semi-annual beneficiary surveys*) of dairy farmers and other stakeholders engaged in MOD. MOD technical staff is directly involved in designing the survey questionnaire, field monitoring and technical assistance, training enumerators, data verification, and overseeing quality assurance processes. Both SRL supervisors and MOD M&E team randomly check completed survey questionnaires with revisits to a small sample of respondents. Based on the analyzed data verified by the MOD M&E team, the data are reported to USDA. The survey provides partial or all information for 9 of the 22 indicators (Indicators are 1 (Standard Indicator #1), 4 (Standard Indicator #3), 5 (Standard Indicator #2), 10 (Standard Indicator #15), 11 (Standard Indicator #5), 13 (Standard Indicator #11), 14 (Standard Indicator #6), 16 (Standard Indicator #9) and 21 (Custom Indicator for Activity #5)).

The first survey was Wave\_1 in March 2019, and 375 MOD producers were interviewed. At the time of Wave\_1 batch in March 2019, MOD was only working with 446 dairy farmers so SRL interviewed 345. At that time, MOD decided to use probability proportional sampling (PPS) which considers the percentage of dairy farmers in each district across the country. Since the project works in up to 16 different districts, MOD needed to make sure the sample distribution was representative of the total population but also had a sufficient number of samples for statistical purposes in each district.

In Wave\_2 in September 2019, MOD was working with approximately 1,500 dairy farmers. At that time, MOD made the decision to do cluster sampling included 288 Wave\_1 dairy farmers in addition to another 608 new dairy farmers. Again the sample size was determined on sample distribution across 16 districts while ensuring sufficient number of samples for statistical purposes in each district.

Since MOD's performance targets are annual figures, MOD decided that Wave\_3 in March 2020 (semi-annual point) did not need as large of a sample size (i.e. less statistically significant) as MOD was merely needing to estimate actual figures for mid-year point and to inform technical management of any major changes with the farmers during this six month period. MOD once again included a smaller sample of Wave\_1 batch along with randomizing all other dairy farmers resulting in 201 dairy farmers interviewed/sampled. The dairy farmers interviewed (not Wave\_1 batch) were randomly selected thus some were new, some were old, some had been interviewed before and some had never been interviewed.

### **2.1.2. Training Attendance Sheets**

The details of the direct beneficiary are collected on who had undergone MOD trainings, seminars, workshop, and conferences such as dairy farmers, commercial fodder cultivators, input retailers, private sector extension agents, public vets, public livestock development instructors (LDIs), artificial insemination (AI) technicians, MOD trainers and AIDA members. The data are collected through completed signed attendance sheets. Hard copies of attendance sheets with gender segregated data and their signatures confirming participation in the trainings events are kept in MOD head office, and data entered into the database by two data entry operators. This data provides partial or all information for 5 of the 22 indicators (Indicators are 2 (Standard Indicator #17), 3 (Standard Indicator #18 ), 6 (Standard Indicator #16), 9 (Standard Indicator #4) & 17 (Custom Indicator for Activity #1)).

### **2.1.3. Field Data Collection Forms**

There are field data collection forms developed and used by MOD. These 11 forms were developed by the technical team and are filled out by the MOD team in the field. The below data forms are available in all three languages. In some instances, field staff directly filled out the hard copy of the form and then it is uploaded in the Colombo office by data entry staff. In other instances, field staff have direct access to the MOD database and thus upload directly from the field into the database. Not all forms are uploaded into the database but instead data are inputted into excel sheets for analysis.

- (A) *Dairy farmers*: 1) Farmer Assessment form is used as initial farmer profile data sheet, 2) Key Performance Indicator (KPI) form is used to collect the farmer information at the beginning of engagement with farmer and set forth a plan for growth, 3) Dairy farmer Mentoring and Monitoring (M&M) form is used by field staff to examine the farmer performance periodically when visiting the farms and dairy farmers.
- (B) *Commercial Fodder Cultivators*: 1) Commercial fodder cultivators assessment form is used as initial cultivator profile data sheet and 2) Commercial Fodder Cultivator M&M form is used by field staff to collect data and monitor progress. These forms provide partial or all information for 3 of the 22 indicators (Indicators are 1 (Standard Indicator #1), 4 (Standard Indicator #3), & 16 (Standard #9)).
- (C) *Input Retailers*: 1) Action Plan and 2) M&M forms designed based on the KPI introduced in their input retailer action plan are cross-checked by field staff and reported to USDA input retailer's performance related indicators. This data provides

- partial or all information for 3 of the 22 indicators (Indicators are 15 (Standard Indicator #7), 16 (Standard Indicator #9), & 18 (Custom Indicator for Activity 2)).
- (D) *Storage capacity*: Dry storage data collection form is designed to collect the dry storage capacity (e.g. silage) of dairy farmers. Cool storage capacity of the dairy processors is collected via direct contact with written confirmation by the processing companies and reported to USDA. This data provides partial or all information for 2 of the 22 indicators (Indicators are 13 (Standard Indicator #11) & 16 (Standard Indicator #9)).
  - (E) *Large Farms*: 1) An assessment form is used as initial profile and for selection purposes and 2) a large farm data collection form is used to collect their milk production and sales value details and reported to USDA. This data provides partial or all information for 3 of the 22 indicators (Indicators are 7 (Standard Indicator #13), 8 (Standard Indicator #14) & 16 (Standard Indicator #9)).
  - (F) *Financial Checklist*: Used by field staff to assess the farmers needs on financial requirements and present investments. This data provides partial or all data for Indicators 9 (Standard Indicator #4) & 14 (Standard Indicator #6).

#### **2.1.4. Dairy Processors**

Dairy processing companies provide producer data on a 6-month basis on production, value prices, FAT and SNF data. MOD provides a list to each processor of producers who are MOD dairy producers. This data provides partial or all information for Indicators 7 (Standard Indicator #13) and 8 (Standard Indicator #14). In addition, processors provide data on their investments in dry and cold storage capacity and number of jobs created. This data provides partial or all information for Indicators 10 (Standard Indicator #15), 13 (Standard Indicator #11) and 16 (Standard Indicator #9). Processing companies provide information on loans made under the SAPP program. This data provides partial or all information for Indicators 9 (Standard Indicator #4), 11 (Standard Indicator 5) and 14 (Standard Indicator #6).

#### **2.1.5. Public - Private Partnerships (PPPs)**

MOD signed 24 Memorandums of Understand (MOUs) between different public and private organizations in support of project activities. These MOUs fulfill the requirement for Indicator #12 (Standard Indicator #8).

#### **2.1.6. Dialog and Saviya**

Dialog (a telecommunications company) implements the Saviya Program, an information and communication technology (ICT) platform, to transmit SMS messages of short info pieces on dairy information to producers. MOD tracks the number of registrants and reports on Indicator 20 (Custom Indicator for Activity #4).

#### **2.1.7. All Island Dairy Association (AIDA)**

MOD reports on the number of paid members of AIDA (Indicator #22 (Custom Indicator for Activity #6)).

### **2.1.8. Investment Fund**

The Small Enterprise Assistance Funds (SEAF) is a MOD partner and provides supporting documentation on debt and equity investments from the investment fund. MOD reports this data for Indicator 19 (Custom Indicator for Activity #3).

### **2.1.9. Additional Surveys**

MOD implements additional surveys as needed to gather supporting data in addition to that which is collected regularly. These data support the farmer field surveys which report on other project parameters, such as informal market values of the dairy products and farmers' knowledge on dairy. The data meets the requirements for Indicators 7 (Standard Indicator #13) and 8 (Standard Indicator #14). MOD does not collect data from N-MOD dairy farmers for counterfactual analysis. MOD uses the information for program management to make needed project adjustments and corrections based on field data. Some types of survey information used are:

1. Used the MIS database, personnel positions and placement of regional offices based farm concentrations. The regional office planned for Batticaloa was moved to Dambulla base after an assessment of the concentrations of producers.
2. Included recordkeeping in training Module 1 after the data showed a very low practice of producers keeping dairy records.
3. Grouped farmers into milk production categories based on production information from various sources. The data showed that production volumes were more likely to be achieved if technical support was customized to farms producing over 40 l/d to 60 l/d.
4. Collected data helped MOD to understand the availability of farm resources to increase dairy production. MOD is able to target technical assistance more effectively.
5. Focused on four banks and closely aligned the project with SAPP and other projects to better assist farmers to obtain financing. The data found low success rate of farmers to receive loans.
6. Used data to better understand fodder/silage requirements of farms and farmer groups which improved the training materials to develop fodder and silage entrepreneurs.
7. Surveyed trainers and training participants to revise training materials better suited to the specific needs of dairy producers.

## **2.2. Evaluation Team's Methodology for Data Collection**

The evaluation team collected both quantitative and qualitative data for the mid-term evaluation. The team consisted of an international team leader, a technical specialist (Sri Lankan) and a logistics specialist (Sri Lankan). In addition, there were four professional field enumerators to conduct the interviews. The questionnaires designed for both survey schedules were developed in a participatory approach with the MOD team members to ensure that their key questions were addressed.

### **2.2.1. Quantitative Survey**

A quantitative survey was designed and pre-tested before the start of the field surveys. The evaluation team carried out face to face (F2F) field surveys in March 2020; however, the field surveys were stopped early because of the GOSL's national curfew to address the COVID-19 pandemic. The team then conducted telephone interviews (TLP) of producers instead of F2F interviews of dairy producers. A total of 216 producers were interviewed (See Annex Table 4.1.). The survey numbers were 185 MOD producers and 31 control producers. Since the main focus of the mid-term evaluation was to collate learning for the second half of the program, MOD team members and evaluators agreed to make use of the findings of the recently concluded Wave\_2 survey as well. Our field survey was disturbed by the nation-wide lock-down due to the COVID-19 pandemic, and we had to reassess the feasible number of interviews in the middle. So, we had to settle for the above numbers. The selection of interviewees was by a two-stage cluster sample combined with random sampling within the cluster.

The larger group of dairy farmers surveyed (185) were dairy producers who were receiving MOD interventions. This group was regular dairy farmers (181) and four were model - demonstration farm (DF) producers. In addition, the evaluation team conducted one focus group of four producers in the Northern Province at the farm of a demonstration farmer.

The control group of producers were not currently receiving interventions from MOD, but they have registered to become MOD farmers in the future. There were 31 of these farmers, and they represent a control group who have not received MOD interventions. The interviews were conducted in four key MOD production zones: Mullaitivu, Anuradhapura, Kurunegala, and Nuwara Eliya (Annex Table 4.1.)

The selected producers in each group were utilized to understand the differences between MOD and Non-MOD producers. The sample of respondents were representative of MOD producers. The allocation of respondents by districts was to provide representation of the main project areas of MOD. The sample size was not large enough to address differences between different districts. Since our proceedings were disturbed in the middle, and it was not the intention of the project to compare the significance between the two groups, the interviewed sample of producers (both MOD interventions and control) do not provide adequate rigor to compare the statistical significance.

The Non-MOD farmers interviewed were provided by MOD staff, and it was what was possible to interview within the given time frame for the evaluation. The sample is representative because it includes both men and women dairy farmers. The statistics are informative, but the small sample size would not be able to extend to the larger population of Non-MOD farmers in the districts. The number of MOD farmers (185) was large enough to provide a confidence in projecting to the larger group of MOD farmers. With the given sample size we have reached saturation level of information as expected.

### **2.2.2. Qualitative interviews**

The team conducted 59 qualitative interviews of key stakeholders in MOD. The list of stakeholders included processors, bankers, extension officers, government officials, and sub-contractors. The interviews used a structured set of questions. The interviews were conducted using skype, skype phone and zoom. Transcripts were prepared after each interview, and then entered into the Atlas.ti software for analysis.

### **3. MOD DATA COLLECTION SYSTEMS**

#### **3.1. Evaluation of MOD's Data Collection System**

MOD has established a comprehensive system for tracking performance of the project to meet its desired goals. The methods used for tracking activities are transparent. It is important that MOD collects from several sources to triangulate data to confirm what is observed is accurate. Data are collected from various sources on a regular basis.

##### **3.1.1. Training attendance sheets**

A review of the hard copies was not done, but the evaluation team, in conversations with MOD staff, feels that steps are being taken to secure the information in a timely manner. In field interviews, producers said that they were very satisfied with the training and some mentioned the education materials were useful.

##### **3.1.2. Field data collection forms**

In field interviews, the evaluation team heard complaints that producers felt overwhelmed at times with the number of requests for data and that it was distracting with the delivery of technical advice. The team arranged a meeting with a successful dairy producer but he refused at first to meet with the evaluation team because he was “interviewed out” by MOD staff, and it was disrupting his work (we did meet him eventually). A regional director of MOD relayed the same type of frustration of too many M&E data collection exercises and not enough time left to advise farmers. MOD senior staff are aware of the situation and planning some solution.

##### **3.1.3. Data from dairy processors**

Processors provide information for a six-month period on MOD producers. These data will better track producers' performance going forward. The quality of the data varies by processors – some are computerized, and others are ledger – paper. The reliability of on accuracy of records could be an issue for producers in the future.

##### **3.1.4. Public-Private Partnerships (PPPs)**

In the true sense, these PPPs are agreements between the government (four MOUs) and private companies (20 MOUs) with MOD that they have common interests and will work together during the life of project (LOP). MOD serve as a facilitator between the GOSL and private companies around feed production, training and education, cold supply chain, and quality standards, to mention just a few possibilities. Data are shared with MOD that facilitate the smooth operations of the project.

### **3.1.5. Dialog and Saviya**

In surveys of producers, MOD producers were asked if they were aware of Saviya and only 25% said they were and of this group about 45% said they used/adopted it. All the producers who used Saviya found it useful. There are currently 4,006 registrants on the system, of which 1,861 are MOD producers. More demographic information on gender, age and location about the users would be useful for designing materials and targeting listeners. Saviya requires a strong government buy-in for its sustainability, and that has not happened yet because the MOU between the GOSL and USG has not occurred.

### **3.1.6. All Island Dairy Association (AIDA)**

The data reporting for this indicator is straightforward, and information is easy to collect and verify. However, the reporting of paid members alone does not give a complete picture on the important role the organization plays, and MOD senior staff and consultants have been the reason for its success.

### **3.1.7. Investment fund**

SEAF is an IESC sub-recipient on MOD with responsibility to manage the investment fund when money is transferred from the monetization of U.S. commodities. The date for monetization of commodities (valued at \$2 million) is not certain. In 2019, SEAF conducted an investor workshop for potential investors. SEAF has identified five candidate companies from an initial list of twenty; and negotiations are on-going while SEAF waits for funding.

### **3.1.8. Additional surveys**

MOD takes an evidence-based approach to improve its program activities by conducting a number of additional surveys to guide management decisions. These surveys include rapid market surveys to track demand for certain dairy inputs being promoted by MOD. One area of the population not surveyed are the Non-MOD farmers to understand the impact of MOD compared to where there is no MOD interventions. The evaluation team interviewed 31 Non-MOD farmers to draw comparisons (see Chapter 4). Policy makers can better assess the benefits and costs with and without MOD's intervention with a control group. Non-MOD farmers could be continually surveyed during the remainder of the project.

## **3.2. Performance Monitoring Plan (PMP)**

The analysis of the PMP data for the period ending March 30, 2020 segmented indicators into two groups: Group 1, indicators met or exceeded; and Group 2, indicators not met.

### 3.2.1. Successes in meeting and exceeding target indicators

Out of 22 indicators reported to USDA, MOD exceeded targets in 15 of them. In three of the 15, MOD exceeded the third year target amounts in the first six months. MOD trained trainers and there have been 7,892 beneficiaries directly trained and 23,676 indirectly trained including input suppliers (fodder and silage, artificial inseminators, input retailers), dairy producers (small, medium, and large), chilling center operators, and others. MOD trains government employees who reported positive benefits. Young entrepreneurs are starting businesses to supply forage and silage. MOD assists with business planning, financial advising, and market linkages. A successful entrepreneur grows forage, packages it, and sells to dairy producers (Box 3.1.). An impressive achievement has been the spread effect to N-MOD producers residing near to DFs (Box 3.2.). MOD has over 40 DFs, and they serve as examples of good dairy practices. Producers can see an automatic waterer, chaff cutter, concrete pads, and a proper feed bunk. A DF owner expressed pride in being recognized by MOD, local government, and their community. A demonstration farmer in the North Western Province has hosted five trainings at his farm, and farmers now visit him to discuss how to do a total mixed ration (TMR), learn about his milk machine and test his chopper. He has a calf that was separated from the mother and given 5 l/d of milk to start and after three weeks is feeding 1.5 l/d. He sees a difference in size and health compared to other calves in herd (see photograph 12).

**Box 3.1. Silage making machinery**



**Box 3.2. Focus Group Discussion at a DF in Northern Province**



### 3.2.2. Challenges in targets indicators and mitigation measures

MOD faces challenges in meeting seven six of the 22 indicators. The difficulties stem from external factors outside the control of MOD. For some of these, MOD will need to reduce the targets set for the LOP. Data are for the six-month reporting period ending March 30, 2020.

**Number of hectares of land under improved techniques or technologies as a result of USDA assistance.** 1,554 hectares (HA) have been in fodder production which is approximately 28% of the target for the project. MOD is building momentum in fodder and silage production, but it is unlikely to reach the LOP target of 5,506 HA in improved techniques. Fodder production as a commercial enterprise is early in the adoption phase, and MOD is building a demand for fodder. Fodder producers must deal with a number of issues around drought, ground water availability, army worms, and even elephant incursions.

**Volume of commodities (MT) sold by project beneficiaries.** Domestic milk production was down in 2019 (Table 1.1.). One processor reported a drop in raw milk supplies from 170,000 l/d to 104,000 l/d, and another processor experienced 20 – 25% decline in supplies. Milk production estimates are lower because of the number of smallholder farms that would be starting at 40 l/d and which puts MOD at level below the baseline estimate and on a trajectory that is lower than expected. The number of large scale dairies (LSDs) planned in MOD's projection have gone out of business because of poor planning on feeding and managing large numbers of cows in a facility. It remains unlikely MOD can reach the quantity target because of the structural situation, and the increased number of smaller farms on-line with MOD will not result in achieving the LOP volume target of 87,820 MT.

**Value of sales by project beneficiaries (USD).** Value of milk sales rebounded in the first six months of 2019/2020 compared to the 2018/2019 project year with a value of \$16.97 million. Prices paid continue to be strong so MOD could finish the 3rd year above the target of \$26.9 million. Increased prices have offset the supply shortages.

**Number of loans disbursed as a result of USDA assistance.** MOD is exceeding its target of providing financial advisory services to both men and women. However, only 10% of the Year 2 target (55 versus 540 loans) of actual loans were disbursed in the 2018/2019 project year. In the first half of Year 3, MOD is at 52% of its annual target (379 of 720 loans). MOD is at 20% of the target for the LOP (434 of 2,160). During Module 4 trainings, MOD trainers educate producers about lending requirements but the project does not guarantee loans or provide subsidies. MOD is unlikely to meet its target for the LOP of 2,160. MOD plans to continue working with the Suwashiakthi and SAPP.

**Value of loans provided as a result of USDA assistance (USD).** The value of loans to MOD beneficiaries is at 12% of the LOP target for the project (\$654,621 of \$5,600,000). This target is disaggregated for women and for men, with the project reaching 35% of the target for women, and 18% of the target for men, through Year 3. Banks are making smaller loans at less Rs. 165,000 rather than projected at Rs.500,000.

**Value of new public and private sector investment leveraged as a result of USDA assistance (USD).** Investments made up to March 30th, 2020 was \$3,970,635 which is 16% of the \$24.15 million LOP target. The delay in receiving funding slowed the engagement of banks and other lenders. The financial sector was also impacted by political change and terrorism in 2019 and a history of defaulted loans in the dairy sector. HDFC was the last of the three banks to sign an MOU with MOD in January 2020.

**Value of Overseas Private Investment Cooperation (OPIC)/USDA investment fund supported debt and/or equity financing disbursed to enterprises/individuals within**

**target areas.** This activity is hampered by the delay in monetization of \$2.0 million in commodities. SEAF conducted initial work to promote the Investment Fund with an investor workshop in 2019 and screened a list of potential investors. No scheduled delivery of commodities is planned at this time.

### 3.3. Wave\_1 and Wave\_2 Producer Surveys

The data that MOD is collecting is useful for tracking rates of adoption. A comparison was made on adoption of practices between the two sets of producers (Wave\_1 and Wave\_2), which could be associated with MOD's interventions (Table 3.1.). Wave\_2 (Column 5 in Table 3.1.) are just first-time interviewees that had received MOD interventions from March to August 2019, a shorter period than Wave\_1. The analysis found that when comparing Wave\_1 and Wave\_2 survey data, there were trends in improvements between two reporting time periods because of MOD activities. The analysis found positive improvements in practices leading to behavior change in how producers manage their dairy animals.

**Herd composition.** Wave\_1 producers reported that the number of cows in the herd increased from 6.97 heads (hd) to 9.88 hd. The percent of milking cows increased over the time period, 45% to 63% for Wave\_1. Cows purchased increased from .47 head to 1.89 head – a positive indicator of expansion because of MOD interventions.

**Fodder production and practices.** Producers reported increases in adoption of a number of improved fodder production practices. There are eleven improved fodder practices promoted by MOD. Wave\_1 producers reported increasing adoption of 10 of these for the reporting periods. The only practice that declined was mechanical harvesting of forage. Producers planting forage increased from 51% to 56% for Wave\_1 producers. Wave\_2 producers reported an initial lower percentage planting forage at 36%. MOD faces challenges in getting more producers to plant quality forages instead of collecting road side grasses.

**Feeds and feeding.** Producers reported increased use of improved forages like CO3 and Sugar graze for making silage, but their use is still low, at less than 30%. Wave\_2 producers reported less than 20% adopted improved seeds. The production of silage increased from 8% to 18% which is positive, but the adoption level still remains low. The situation will change as more silage makers enter the business because of MOD's efforts. The use of Total Mix Ration (TMR) rose from 12% to 37%. This is a very encouraging development. Wave\_2 farmers are starting at a lower level (18%) but expected to follow Wave\_1 producers in more adoption as time goes on.

**Water 24/7.** The practice of having water available 24/7 (either automatic or buckets) is a simple and cost-effective method to increase milk production. Farmers in Wave\_1 adopting this practice went from 15% to 45%, a 300% increase. Producers would benefit knowing that cows consume 30% to 60% of their daily water needs shortly after milking.

**Calf and cow management.** The initial percentages on adoption of seven calf management practices are low for both Wave\_1 (8.85%) and Wave\_2 (15.7%). The low beginning rates for calf management reflects producers' lack of understanding that the health of the calf determines future pregnancy and milk production. Wave\_1 respondents reported in the second time period to have increased adoption rates to 31.28%, which is attributable to MOD interventions. Two most important calf management practices are: (1) wean calves at three months and (2) not feeding green chop to calves before 3 months. MOD's producers increased their adoption rate by 27% for these two practices. Cow management improved for Wave\_1 producers, which will boost milk

performance. Wave\_2 producers are starting at a lower level than Wave\_1. MOD will see upside adoption for both Wave\_1 and Wave\_2 producers as training and advising continues.

**Manure management.** Cow dung is an important by-product of the dairy enterprise with uses for biogas, fertilizer, or sale. Less than 50% of Wave\_1 farmers reported some type of management of their manure. Wave\_2 farmers reported even less use. Only one farm visited had a biogas unit. Manure can be used in the home gardens. MOD can emphasize greater use of manure.

**Milk production and quality.** Producers reported in Wave\_1 that milk production increased (from 70%) from the first survey (March 2019) to second survey in August 2019 (to 84%). The new producers added in Wave\_2 said that 74% had improved milk production. For Wave\_3 (September 2019 to March 2020) the survey found 69% said production increased. This could be because of FMD and seasonality, but not sure exactly. In a second question, producers were asked if their milk quality improved. The survey of Wave\_1 producers (March 2019) found 68% said it improved and in August 2019, the percent increased to 75%. The Wave\_2 producers, with less time with MOD said 62% had improved quality. The results for the Wave\_3 survey period was 74% said improved for the period, September 2019 to March 2020.

| Table 3.1. Behavior Changes in dairy production because of MOD training - Wave_1 and Wave_2. |                                                                                  | Period 1 | Period 2 | Period 2 |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------|----------|----------|
|                                                                                              |                                                                                  | Wave_1   | Wave_1   | Wave_2   |
| Q2. - Q3.                                                                                    | Herd size and composition                                                        |          |          |          |
| Q2.a.                                                                                        | Size of the dairy herd                                                           | 15.32    | 15.66    | 12.79    |
|                                                                                              | How many cows?                                                                   | 6.97     | 9.88     | 7.99     |
| Q2.b.                                                                                        | % of cows of total herd?                                                         | 45%      | 63%      | 62%      |
|                                                                                              | How many cows are milking?                                                       | 4.48     | 5.97     | 4.30     |
| Q2.c.                                                                                        | % milking cows of total herd?                                                    | 29%      | 38%      | 34%      |
|                                                                                              | How many are dry cows?                                                           | 2.49     | 3.91     | 3.69     |
|                                                                                              | % dry cows of total herd?                                                        | 16%      | 25%      | 29%      |
|                                                                                              | How many heifers over 1 year?                                                    | 4.38     | n.a.     | n.a.     |
|                                                                                              | How many are heifer calves under 1 year                                          | 3.01     | n.a.     | n.a.     |
|                                                                                              | % Replacement heifer of total herd                                               | 48%      | n.a.     | n.a.     |
| Q3.a.                                                                                        | How many animals purchased in last few month?                                    | 0.47     | 1.89     | 2.06     |
| Q3.b.                                                                                        | How many animals removed from your herd in the last few months?                  | 1.75     | 1.58     | 1.89     |
| <b>Q4.</b>                                                                                   | <b>Fodder Cultivation</b>                                                        |          |          |          |
| Q4.a.                                                                                        | Have fodder currently planted?                                                   | 51%      | 56%      | 36%      |
| <b>Q5.</b>                                                                                   | <b>Fodder Cultivation Practices</b>                                              |          |          |          |
| Q5.1                                                                                         | Mechanized seed planter                                                          | 5%       | 17%      | 17%      |
| Q5.2                                                                                         | Mechanized fertilizer application                                                | 5%       | 21%      | 14%      |
| Q5.3                                                                                         | Mechanized Weeding                                                               | 5%       | 16%      | 12%      |
| Q5.4                                                                                         | Irrigation drip/sprinklers/rain gun/watering using hose/ have prepared drainages | 5%       | 31%      | 19%      |
| Q5.5                                                                                         | Mechanical harvesting                                                            | 45%      | 27%      | 17%      |
| Q5.6                                                                                         | Row planting and land preparation techniques                                     | 14%      | 35%      | 24%      |
| Q5.7                                                                                         | Calculate Year-round fodder requirements for herd                                | 11%      | 43%      | 26%      |
| Q5.8                                                                                         | Cultivate fodder for year-round feeding                                          | 13%      | 47%      | 32%      |
| Q5.9                                                                                         | Usage of chaff cutters to cut grass                                              | 9%       | 33%      | 19%      |
| Q5.10                                                                                        | Giving nutritious feed for all animals years around                              | 24%      | 54%      | 35%      |
| Q5.11                                                                                        | Planting fodder after separating the land for different sections                 | 20%      | 45%      | 26%      |

|              |                                                                  |      |     |     |
|--------------|------------------------------------------------------------------|------|-----|-----|
| <b>Q6.</b>   | <b>Grass and Forage Types on Your Farm</b>                       |      |     |     |
| Q6.a         | Cultivating fodder varieties that I have never cultivated before |      |     |     |
|              | C03                                                              | 8%   | 27% | 14% |
|              | Gini Grass                                                       | 6%   | 14% | 9%  |
|              | Sorghum                                                          | 7%   | 20% | 19% |
|              | Dahl dust/Grinded dahl                                           | 6%   | 24% | 11% |
|              | Rice Polish                                                      | 6%   | 27% | 14% |
|              | Silage                                                           | 8%   | 18% | 9%  |
|              | TMR – Mixed food                                                 | 12%  | 37% | 18% |
|              | Asola                                                            | 8%   | 14% | 13% |
|              | Ipil Ipil                                                        | 6%   | 7%  | 5%  |
|              | Gliricidia                                                       | 9%   | 12% | 5%  |
|              | Light Grass (Grass in young age before flowers grown)            | 12%  | 15% | 9%  |
|              | Paddy Straw                                                      | 3%   | 5%  | 5%  |
|              | Paddy                                                            | 3%   | 9%  | 5%  |
|              | Grass on the street / jungle                                     | 4%   | 4%  | 4%  |
|              | Maize                                                            | 8%   | 11% | 6%  |
|              | Atawara                                                          | 3%   | 6%  | 5%  |
| <b>Q7.</b>   | <b>Good Practices for Provision of Water to Cattle</b>           |      |     |     |
| Q7.a.        | Provide water to cattle 24/7                                     | 15%  | 45% | 27% |
| Q7.b.        | Provide water with automated delivery system                     | 6%   | 23% | 11% |
| Q7.c.        | Keep buckets of water near cattle                                | 10%  | 26% | 16% |
| <b>Q8.</b>   | <b>Good Calf Management</b>                                      |      |     |     |
| Q8.a.        | Separate calves from mother within 6 hours                       | 6%   | 24% | 13% |
| Q8.b.        | Use of calf pen or separate area for calves                      | 7%   | 23% | 13% |
| Q8.c.        | Practice weaning within 2-3 months and introduce calf supplement | 11%  | 33% | 19% |
| Q8.d.        | Calf feeding using bottle                                        | 7%   | 22% | 12% |
| Q8.e.        | Not feeding green chop to calves for 1st three months            | 11%  | 43% | 20% |
| Q8.f.        | Provide balanced feed ration to manage calf weight               | 12%  | 43% | 18% |
| Q8.g.        | Regular weighing of calves                                       | 8%   | 31% | 15% |
| <b>Q9.</b>   | <b>Good Management of Milking Cows</b>                           |      |     |     |
| Q9.a.        | First calf by 24 months                                          | 8%   | 30% | 15% |
| Q9.b.        | Impregnate cows within 3 months                                  | 8%   | 31% | 14% |
| Q9.c.        | Separate and feed the pregnant cows                              | 11%  | 31% | 18% |
| Q9.d.        | Feed Sahinda Luna to pregnant cows                               | 16%  | 33% | 21% |
| Q9.e.        | Monitor body condition of cows                                   | 28%  | 59% | 36% |
| Q9.f.        | Stop milking after 7 months                                      | 12%  | 34% | 15% |
| Q9.g.        | Having 60 - 70% milking animals throughout the year              | 12%  | 39% | 16% |
| Q9.h.        | Ensure cow gives birth every year                                | 8%   | 31% | 15% |
| Q9.i.        | Removng unproductive animals from the herd                       | 13%  | 30% | 13% |
| <b>Q.10.</b> | <b>Effluent Management</b>                                       |      |     |     |
| Q.10.a.      | Have a biogas unit                                               | 3%   | 4%  | 3%  |
| Q.10.b.      | Use dung for fertilizer                                          | 6%   | 17% | 5%  |
| Q.10.c.      | Have a pit for holding dung                                      | 5%   | 14% | 5%  |
| Q.10.d.      | Sell dung                                                        | n.a. | 12% | 4%  |
| <b>Q16.</b>  | <b>Improvement in Production and Quality of Milk</b>             |      |     |     |
| Q16.a.       | Production Improved - Yes                                        | 70%  | 84% | 74% |
| Q16.a.       | Quality Improved - Yes                                           | 68%  | 75% | 62% |

**Land area.** Wave\_1 farmers (52%) reported having one acre or more in fodder production while in Wave\_2 the percentage fell to 39%. As MOD seeks new entrants into the program, farmers have smaller herds and less land available. This is a worrisome sign that farmers do not have the available land to put into fodder for their dairy cattle. More research by MOD is needed on types of land farmers would put into forage production and best forage varieties.

**Recordkeeping.** The data from Wave\_1 and Wave\_2 found low rates of recordkeeping. Producers at MOD training said they appreciated how to estimate costs of production, yet MOD staff found producers do not keep regular records after attending training. Women are more likely to keep better records than men

**Labor.** Small and Medium-Scale Dairies (SMSDs) rely on family labor, and it is common for both spouses and the children to be engaged in caring for the livestock. Producers may employ a part-time laborer, but very few interviewed pay a full-time laborer. The availability of family labor time will be a major impediment to farmers adopting better dairy practices. LSDs hire both full- and part-time staff but finding people with the necessary skills can be a challenge (based on interviews with U.S. dairy consultants). Technologies for forage production offer the opportunity to reduce the labor required in forage production. With a new planter, one acre of land can be planted in one day by one person when before it took 16 people. The cost to plant is Rs.1,500 per acre. MOD's boost in milk sales creates jobs as found in Kenya dairy industry where each additional 1,000 liter of milk produced created 23 self-employed jobs, 50 hired employees, and three casual laborers. At the processing level, each additional 1,000 liter of milk handled created 13 full-time jobs.<sup>3</sup> It is possible that MOD is undercounting the additional employment based on these figures from Kenya.

**Loans.** Farmers mentioned the difficulty in obtaining loans from financial institutions. MOD facilitated over 2,600 producers receiving financial services up to March 30, 2020. The number of loans disbursed up to Year 3 is 434 which is 20% of the target for the LOP. Successful loans increased from 77 to 139 but the numbers are too low. The majority of loans were less than Rs.500,000 (USD \$2,777), which was projected amount at the baseline. The average loan was Rs.332,000 (USD \$1,844) for producers interviewed in Wave\_1, but new producers surveyed in Wave\_2 said their loan amount was Rs.250,000 (USD \$1,388). The trend is that banks that will lend to dairies are doing so at a lower amount.

**Investment.** Dairy farmers want to invest in their enterprises because of higher milk prices. Investments made in Wave\_1 were 154, and the number increased in the Wave\_2 to 236. Most investments were less than Rs.10,000 (Table 3.2.). Producers affiliated with processors are investing at a higher rate than producers with other processors. Female and male producers invest in their dairy operations, though men at a slightly higher level. The districts with higher producer investments are in Nuwara Eliya, Anuradhapura, and Vavuniya.

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<sup>3</sup> Muriuki, H.G. (2011). "Dairy Development in Kenya." FAO, Rome.

**Table. 3.2. Number of investments by MOD producers by Wave\_1 and Wave\_2**

| Amount of Investment (Rs.) | Wave_1 # of Producers | Wave_2 # of Producers |
|----------------------------|-----------------------|-----------------------|
| < 10,000                   | 64                    | 149                   |
| 10,000 – 50,000            | 53                    | 56                    |
| 50,000 – 100,000           | 12                    | 15                    |
| 100,000 – 250,000          | 17                    | 12                    |
| 250,000 – 500,000          | 6                     | 3                     |
| 500,000 – 1,000,000        | 2                     | 1                     |
| Total                      | 154                   | 236                   |

### 3.4. Adoption rates

MOD surveyed 345 dairy producers in Wave\_1, and 34% of respondents had not adopted any MOD practices (Table 3.3.). In Wave\_2, producers not adopting fell to 22% (195 producers out of 896), and for Wave\_3 the number not adopting was even lower at 10%. As MOD continues, more producers are adopting MOD's recommendations. The number of producers adopting at least three practices increased from 36% in Wave\_1, to 54% in Wave\_2, to 75% in Wave\_3. MOD's research found that producers doing at least three improved practices can have a 1 to 3 liters/head/day (l/h/d) increase within one week.

**Table 3.3. Rates of adoption of MOD's recommended practices**

|                       | Wave_1 |      | Wave_2 |      | Wave_3 |      |
|-----------------------|--------|------|--------|------|--------|------|
|                       | Total  |      | Total  |      | Total  |      |
|                       | C      | %    | C      | %    | C      | %    |
| Base: All Respondents | 345    | 100% | 896    | 100% | 201    | 100% |
| No Adoption           | 117    | 34%  | 195    | 22%  | 20     | 10%  |
| At least 1            | 53     | 15%  | 126    | 14%  | 19     | 10%  |
| At least 2            | 53     | 15%  | 93     | 10%  | 11     | 5%   |
| At least 3            | 36     | 10%  | 63     | 7%   | 19     | 10%  |
| At least 4            | 27     | 8%   | 37     | 4%   | 19     | 10%  |
| At least 5            | 17     | 5%   | 34     | 4%   | 10     | 5%   |
| At least 6            | 12     | 4%   | 23     | 2%   | 14     | 7%   |
| At least 7            | 8      | 2%   | 27     | 3%   | 10     | 5%   |
| At least 8            | 6      | 2%   | 23     | 3%   | 9      | 4%   |
| At least 9            | 7      | 2%   | 15     | 2%   | 9      | 4%   |
| 10 or more            | 9      | 3%   | 260    | 29%  | 61     | 30%  |
|                       | 345    | 100% | 896    | 100% | 201    | 100% |

### 3.5. Production and prices data provided by a processor

A dairy processor provided records on prices paid to MOD dairy producers for two 6-month periods. The data were volume, price, and FAT % and SNF % (see Table 3.4.). The data for 27 producers found that production increased over the two periods. Productivity per cow increased from 8.19 l/d to 10.00 l/d, a 22% increase. The change in productivity can be because of MOD interventions, as well as seasonal factors (climate, feed, and the environment conditions).

**Table 3.4. Milk revenues for dairy producers for two six-month periods**

|                         | Period #1 Mar.-Aug, '19 | Period #2, Sept -Oct. '20 | Change % |
|-------------------------|-------------------------|---------------------------|----------|
| No. of Producers        | 27                      | 26                        |          |
| Production (liters)     | 3,425                   | 4,370                     | +27.6%   |
| Liters/day              | 19.27                   | 24.28                     | +26.0%   |
| Liters/milking cow      | 8.19                    | 10.00                     | +22.1%   |
| Price (Rs)/liters       | 69.88                   | 70.55                     | < +1%    |
| FAT (%)                 | 4.17                    | 4.34                      | + 4.08%  |
| SNF (%)                 | 8.49                    | 8.71                      | + 2.6%   |
| Revenues/herd (Rs)      | 239,339                 | 308,303                   | +28.8%   |
| Revenues/herd/day (Rs)  | 1,329                   | 1,712                     | +28.9%   |
| US\$/herd/day Rs.180/US | \$7.39                  | \$9.52                    | +28/8%   |

The number of producers with cows producing in four productivity groups (0-5 l/d, 5-10 l/d, 10-15 l/d, +15 l/d) reveals a predominance in the low production levels (Table 3.5.). From period 1 to period 2, the number of producers with cows producing more milk per cow increased in 5–10 l/d and the over 15+ l/d ranges.

**Table 3.5. Producers divided into four production categories (milk per cow - l/d) in two six-month reporting periods**

| Productivity Groups | Period #1- producers<br>March-September '19 | Period #2 producers<br>October '19 -March '20 | Change in<br>number |
|---------------------|---------------------------------------------|-----------------------------------------------|---------------------|
| 0 – <5 l/d          | 10                                          | 7                                             | decrease            |
| 5 – <10 l/d         | 9                                           | 11                                            | increase            |
| 10 – <15 l/d        | 5                                           | 4                                             | decrease            |
| Over 15 l/d         | 3                                           | 4                                             | increase            |
| Number of herds     | 27                                          | 26                                            |                     |

Source. Processor data

### 3.6. Engagement Index (EI)

MOD promotes ten best practices to dairy producers to improve milk production (Table 3.6.). MOD tracks producers' adoption of each practice. The MOD technical team gave a weight of importance to each practice and the weights add to 1.00. The two practices with the highest weights are: (i) having available feed throughout the year and (ii) 24/7 water availability.

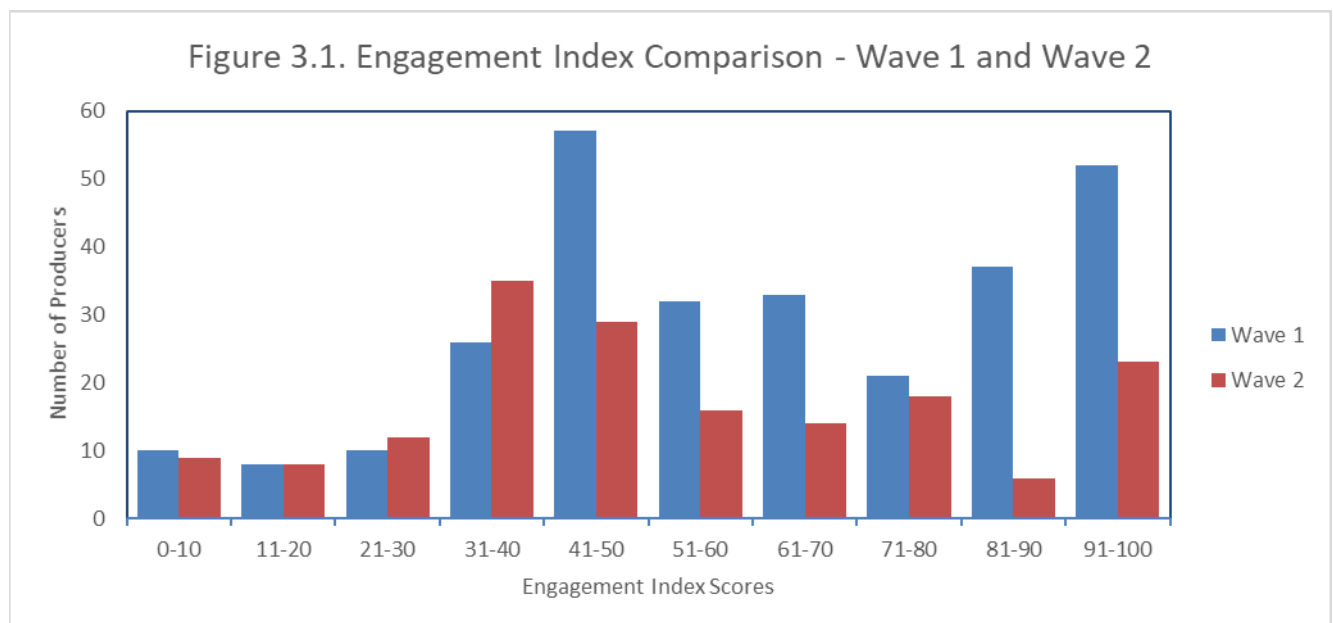
**Table 3.6. Ten improved dairy practices promoted by MOD and their weight of importance**

| No. | Qtn.#        | Practices                                                              | weight |
|-----|--------------|------------------------------------------------------------------------|--------|
| 1   | #5.10.       | Availability of nutritious feed for all animals year-round             | .264   |
| 2   | #6c.         | Making silage yourself or identify a source to purchase silage         | .140   |
| 3   | #6d.         | Facilities and equipment to make TMR                                   | .083   |
| 4   | #7.1.        | 7/24 Hour Drinking Water for Animals                                   | .238   |
| 5   | #8.1.        | Practice of separating calf from mother within six hours of birth      | .043   |
| 6   | #8.3.        | Weaning (Weeks 8-12)                                                   | .036   |
| 7   | #9.1.        | AI for Heifers done at 15 months and First calf within 24 months       | .043   |
| 8   | #9.7.        | Herd composition – you have 60-70% milking animals throughout the year | .067   |
| 9   | #9.8         | Cows giving birth to a calf every year                                 | .043   |
| 10  | #10.1,2,3,4, | Manage your dairy effluents                                            | .043   |
|     |              | Score                                                                  | 1.00   |

Note. Weights determined by MOD technical staff.

### 3.6.1. EI scores for Wave\_1 and Wave\_2 data

In Wave\_2 survey, the EI scores were assigned to producers in Wave\_1 (288 producers) and Wave\_2 (170 producers). The Figure 3.1. histogram shows a tendency for producers to fall into the range of 31 to 50 scores and in the 81 – 100 scores. Producers in Wave\_1 had higher EI scores in the upper ranges. Wave\_1 producers have higher EI scores because they have had a longer period of engagement with MOD interventions.



EI scores for producers reveals positive correlations between a higher EI score and higher levels of FAT and SNF, though the association was a weak positive. There were no other strong associations. More analysis needs to take place on the larger database .

## **4. EVALUATION PRODUCER SURVEY – QUANTITATIVE DATA**

### **4.1. Producer Survey and Comparison with Control Group**

The evaluation team planned to conduct both a producer survey and the control group survey as a way to compare field observations with MOD's monitoring and evaluation program. The interviewed sample of producers (both interventions and control) do not provide adequate rigor to compare the statistical significance with MOD survey data, and it was not the intention of the evaluation survey to produce statistically significant comparisons between the groups of data. However, with the given sample size for the evaluation, we feel we reached saturation level of information, as we expected.

#### **4.1.1. Dairy as the primary income**

MOD and N-MOD respondents said that dairy was their primary source of household income. Crop production was mentioned by less than 10% with a few reporting formal and casual employment. The results were similar for N-MOD producers (see Annex Table 4.2.). This can be partly explained by the selection of the control group who were existing dairy producers who aligned with MOD's selection criteria. This control group would have similar characteristic to MOD producer but have not been exposed to MOD interventions. The selection criteria include aspects such as number of cows, volume of milk, available land, willingness to adopt practices, potential to grow, supplying to formal market, etc.

#### **4.1.2. Food crop cultivation**

The majority of producers in both groups cultivated food crops (approximately 79%), which establishes a strong relationship between agriculture and livestock activities. The main food crops are rice and vegetables (leafy and non-leafy) and less so maize, beans, and fruits (Annex Table 4.3.).

#### **4.1.3. Herd structure and milk production**

MOD producers have a slightly larger current herd size (16.04 head) compared to N-MOD producers (12.06 head) (Annex Table 4.4.). Producers in both groups reported smaller herd sizes from one year ago (respectively 18.33 and 14.90 head) (Table 4.5.). Producers in both groups have approximately the same number of milking cows of 3.70. The current milk production of the two groups of producers (MOD and N-MOD) have a large percent of producers producing less than 25 l/d (respectively 71.9% and 71%) (Annex Table 4.6.). The average milk production per herd declined from last year and yield per cow production was in the range of 6 to 7 l/d (Annex Table 4.7.). MOD producers could be grouped based on productivity per milking cow into three classes: less than 5 l/d (34%), 5 – 10 l/d (50%), and more than 10 l/d (18%). N-MOD producers had slightly higher percentage of producers in the low range (40%) and high range (20%) and a lower percentage in the middle range of 5 – 10 l/d class (40%) (Annex 4.8.)

#### **4.1.4. Feed**

The most common feed types used by MOD farmers are fodder (88%), concentrates (69%) and minerals (86%) (see Annex Table 4.9.). Producers reported high use of roadside grass (66.3%). Use of silage in the MOD group was low (16.8%), and almost non-existent in the N-MOD group (3.3%). The increased use of silage by the N-MOD group indicates the effect of MOD training versus no exposure to use of silage. MOD producers reported mainly growing and producing their own silage (90.32%) (Annex Table 4.10.). MOD and N-MOD producers reported using 3 to 4 types of feed varieties for their cattle (Annex Table 4.11.).

#### **4.1.5. Artificial Insemination**

The use of AI is more prevalent in the MOD group (84%) than N-MOD (65%). The difference between MOD and N\_MOD is showing that more information and educated on benefits of AI compared to N-MOD. The average number of AIs by each group was approximately the same at between seven and eight per year and the success rate was higher for N-MOD producers (58%) versus MOD producers (45%) (Annex Table 4.12.). The majority of MOD and N-MOD producers reported being satisfied or highly satisfied with their AI service (Annex Table 4.13.). The AI inseminator was mainly government staff (Annex Table 4.14.).

#### **4.1.6. Milk marketing**

The majority of respondents in both groups mainly sold to a collection center of a processor (71% and 68%, respectively) (Annex Table 4.15.). A majority of producers said that the travel time to the collection point was less than 15 minutes (Annex Table 4.16.). Both producer groups had the similar practice of evening milking at 50% (Annex Table 4.17.). MOD producers not milking in the evening had a greater interest to start evening milking (62%) than N-MOD producers (40%). MOD producers said that the reason for not milking in evening was no processor was available (38%) and milking in the evening hurts morning milk yields (26%) (Table 4.18.). The opportunity for evening milking exists, and the collection by processors would increase the volume of milk entering the formal supply chain.

The rejection rate by buyers is very low for both MOD (12%) and N-MOD producers (6%) (Annex Table 4.19.). For the last several months, processors have been willing to take lower quality milk and even adulterated milk because of the supply shortages. The baseline study team also concurred at that time that there was a low rejection rate by processors.

Producers were asked to report the current price and their price last year at this time. The average price this year for MOD producers is Rs. 71.65 with a range of Rs. 60/l low to a high of Rs.89/l. The current year average price was Rs. 69.74/l and last year was Rs. 65.55/l with a range of Rs.58/l to a high of Rs. 75/l (Annex Table 4.20.). The difference between the current price for MOD versus N-MOD is Rs.5.78. For MOD producers only, approximately 17% said their current price did not change or went down (Annex Table 4.21.). Producers getting a higher price said they began to provide high quality forage (41%) or provided concentrates (35%) (Annex Table 4.22.). Though

prices are going up due to shortages in milk, MOD farmers are receiving incrementally higher prices which may be due to quality (SNF & FAT) improvements and thus higher prices per liter.

#### **4.1.7. Household demographics, education, and gender analysis**

There were 46 female (21%) and 170 male producers (79%) interviewed in the four districts (Annex Table 4.23.). For MOD producers, women producers had a smaller herd size (11.51 heads) compared to men (17.42 heads) (Annex Table 4.24.). Herd sizes declined slightly for both producer groups from last year. Milk production per herd declined as well with the larger absolute decline by herds managed by men. The current yield per cow ranges from 6.37 l/h/d to 6.62 l/h/d and has declined on average about .40 l/h/d for both producer groups. Women producers are more likely to use silage (29%) compared to men because it reduces their labor time to collect and process roadside grass. Both men and women used AI at about the same rate (84%). Women are slightly more likely to save money from their milk proceeds, and women are more willing to collect evening milk (74%) compared to men (38%). Women may be interested in collecting evening milk as it is additional funds for household expenses and to savings.

Women and men have similar years of formal education (Annex Table 2.25.). The levels of equality in education opportunities means that men are more likely to share decision-making for the dairy and household finances. Men and women both reported schooling beyond the primary level.

#### **4.1.8. Investments in dairy enterprises**

MOD producers made more investments in their dairy enterprise than N-MOD (45% versus 26%) (Annex Table 4.26.). This is a significant finding. Again, showing MOD farmers have made the decision to invest at higher levels and frequency than N-MOD farmers and can infer that MOD is having an influence on them to invest. The majority (66%) of MOD investments were less than Rs.200,000. This was similar for investments by N-MOD producers (Annex Table 4.27.).

#### **4.1.9. Adopt new practices in the last 12 months**

MOD producers (58%) said they adopted new practices in the last 12 months compared to N-MOD producers (13%) who said they did not. It is significant that MOD producers were adopting new technologies because of the awareness received by MOD compare to N-MOD producers. 50% of MOD producers who adopted said they adopted 2-3 practices and 43% of MOD producers who adopted said they adopted 4 or more. The practices with over 50% adopting are: feeding cattle with more nutritious feed (91%), increases in hygiene in dairy operations (60%), and housing related practices (65%) (Annex Table 4.28.).

#### **4.1.10. Effectiveness of MOD interventions (MOD producers only)**

MOD respondents only were asked which interventions were effective for them from the list presented (Annex Table 4.29.). Trainings received the highest (100%) and the on-farm discussions (64%) and then mentoring (53%). The preparations of action plans and business plans were found to be less effective (27% each). MOD respondents (77%) said they had adequate knowledge from MOD to sustain their improvements (Annex Table 4.30.).

#### **4.2. Dairy productivity categories (DPC) for MOD producers only (see Annex 4. B)**

Milk producers were segmented into three categories based on yield per cow per day (l/d): DPC#1 <5; DPC#2, 5-10; and DPC#3, 10+ l/d. The largest number of producers fell into category #2 (Annex Table 4.31.). Producers in category #3 were in the Central Region which mirrors the findings from MOD's baseline report done in 2017. The distribution of MOD and N-MOD producers by DPC reveals both groups have generally the same percentages so no difference. This is not surprising because MOD was applying the same standards in selecting producers for the two groups of beneficiaries.

##### **4.2.1. DPCs education and age of producers**

Across the three DPCs, the percentage of producers with more than primary schooling was consistently around 80% (Table 4.32.). This is important for assessing the likely uptake of extension information MOD presents in its training modules. There is a noticeably low percentage of young farmers under 30 years of age. The majority of producers in dairy across the three DPCs is above 40 years of age (Annex Table 4.33.).

##### **4.2.2. Practices adopted to improve milk production**

Producers reported that the most common practice to improve their milk prices was to begin to feed high quality fodder, and to a slightly lesser extent, provide concentrate feed (Annex Table 4.34.).

##### **4.2.3. Extension training by Livestock Development Instructor (LDI)**

A majority of producers (65% to 74%) in each DPC said they had not received training from an LDI in the past year (Annex Table 4.35.). The outreach by DAPH officers can be a problem because of a lack of people and budget to conduct trainings. MOD is providing a necessary service to producers. A SAPP official said she could not count on government extension service.

##### **4.2.4. Preferred person to contact regarding health of cattle**

Producers said that for a health issue about their cattle they consult with the government veterinarian (Annex Table 4.36.). A DAPH in the Northern Province said that there is a shortage of veterinarians in their district. Producers will have to wait for a period of time before the veterinarian visits the farm. The second issue is that veterinarians will receive some payment, and producers said that the veterinarian will not see other producers on a visit. This would require another separate visit and payment.

#### **4.2.5. Sources, frequencies, and effectiveness of training**

The producers in DPCs reported attending trainings (Annex Table 4.37.). MOD trainings were mentioned as being the most attended, followed by trainings provided by DAPH agents, and then milk processors consistently across the three DPCs (Annex Table 4.35.). Producers attended multiple training events with the common number of visits across DPCs at four events (Annex Table 4.38.). A majority of producers reported completing pre- and post-evaluation questions, and the general opinion was that producers found the trainings to be good or very good (Annex Table 4.39.).

#### **4.2.6. Investments (money and time made in your dairy)**

Producers were asked if they made investments in their dairy enterprises in the last 12 months. There was not much difference across the three DPCs with 40% to 50% stating that they had (Annex Table 4.40.). The majority of the investments by a producer ranged from Rs. 100,000 to Rs. 500,000 (Annex Table 4.41.). Investments over Rs. 500,000 were done by producers producing 5 – 10 l/d.

#### **4.2.7. Outcomes**

The large numbers of producers who said they adopted new practices were in the highest DPC of over 10 l/d (Annex Table 4.42.). This shows that MOD is correct in profiling farmers producing higher volume of milk as they will likely be early and more often adopters of practices. They will lead the way for others to follow which is a critical assumption of the long term sustainability of the project. Producers tend to adopt between 2 – 3 practices rather than just one practice. The highest reported practice was feeding cattle more nutritious feed (about 90% of producer in each DPC). Investments in hygiene and housing were the second most mentioned improved practice.

A majority of producers in each DPC said their dairy business improved (Annex Table 4.43.). If the business did not improve, it was mainly because of lack of feed. Respondents said MOD interventions were most helpful, and the most repeated improvements were in more milk, better quality, and more milk from the same number of cows (Annex Table 4.44.). The number of

improvements varied across the three DPCs, and producers said most adopted more than 3 practices for each DPC.

## **5. QUALITATIVE DATA FROM KEY INFORMANT INTERVIEWS (KIIs)**

A total of 59 qualitative interviews were conducted of KIIs and one focus group of producers. The KIIs represented 9 categories of respondents: input suppliers (fodder, silage) =13, IESC-MOD staff =11, trainers/extension agents=3, non-government organizations (NGOs) =2, MOD consultants =3, public sector representatives= 7, producers and demonstration farmers (DFs) = 14, and information communication technology (ICT) = 1. The transcripts of the interview are in the attached file to the main report. The qualitative data provides additional information on the effectiveness of MOD's activities. The questionnaire for the interviews in an attached file.

### **5.1. Producer Focus Group Discussion (FGD)**

A focus group was held at a DF in the Northern Province and attended by four dairy producers (see photograph 11.7.). One farmer was under 30 years of age and the rest were above 40 years old. Producers gave their cow inventory as 13, 20, 20, and 5 cows. Nestle buys their milk at Rs. 70 – 71/l which is Rs. 3/l more than last year. The producers said that dairy had become more profitable than crop production and relied on their dairy cows for household income. They see themselves as entrepreneurs, and they like the recognition. They hope to expand their dairy herds but are limited by the lack of financing. Some have applied for loans with HNB Bank with help from the MOD Regional Project Coordinator responsible for the Northern Region. They were not successful because the bank officer wanted a guarantor. One producer said he had the same experience applying to RDB bank. They would like MOD to advise on how to expand their herd without receiving a loan and how to reduce their cost of production. They discussed ways they could lease equipment as a group (hand tractor cost Rs. 140,000), though this might cause conflict among themselves. They estimate their cost of production at Rs 40 – 45/liter.

They attended MOD training, and three of the four felt satisfied with the knowledge gained. The fourth said for what MOD proposed he saw risks with the amount of money he needed to invest so he was not interested at this time. If he got a loan, then he would follow the MOD's recommendations. The top "take away" from the training was learning to provide water 24/7 and addition of feed concentrates with clay consistency -- before the feed was too wet. By feeding more fiber, the cow that was giving 6 l/d and is now giving 12 l/d. The group appreciated the work by MOD's technical advisor. Foot and Mouth Disease (FMD) in the Northern Province was a major factor for producers in the area. According to them AI service is not great because it takes 2 – 3 visits before a successful insemination.

### **5.2. Large-Scale Dairy (LSD)**

Interviews were conducted with owners of two large dairies (250 and 2,000 heads). The dairies were started with cattle from a GOSL program with New Zealand/Australia. Some animals died

after arrival, but otherwise the health of herd is ok because of regular vaccinations. Feed is a problem, and a major need from MOD is knowledge on how to properly feed the cows. One owner needs a nutritionist to visit the farm regularly to advise on exact feed formulations. Skilled labor can be an issue for these two dairy operations. U.S. dairy specialists spent time at both farms. Owners saw improvement from their advice during their visits. One farm sells milk directly to a milk processor and receives a price over Rs.100/liter. Farm owners said they were satisfied with the advice provided by the MOD's consultants.

### **5.3. Retail Input Suppliers, Commercial Fodder Cultivators and Silage Enterprises**

The fodder producers had positive comments about MOD's training. They attended multiple trainings and liked the combination of technical information with financial calculations on costs and profits. They learned it was important to know your costs. MOD trainers emphasized how to reduce costs of production. One fodder producer mentioned buying the Wheel Master seeder after seeing the demonstration. They would like to also see types of machinery for harvesting the fodder. One producer said he has no problem getting the poly bags for storing the forage. An important aspect was meeting others in the training and become part of a network for marketing. Training materials were good, and one said he liked the PowerPoint presentation. One producer said he refer often to the materials on finance calculations. They generally agreed that the trainings would be best at an actual field site with forage growing and seeing the forage growing and testing of harvesting machinery. One producer cited the problem of droughts and elephants.

A silage producer sells compressed bags of silage. He started with the SOLID project. MOD provided training and he attended 10 – 12 training sessions and has covered all four modules. MOD helped in the beginning with seed and developing market linkages. He has been able to receive assistance in obtaining financing from HNB Bank for his compressing machine. He built his own building (formerly a carpenter) and with the loan purchased more equipment (see photo file and pictures #9 and #10). Before MOD he was selling 40 MT per month and now his business is doing 200 MT per month. He was most appreciative of MOD doing the training, providing materials, and then helping him with the action plan.

A common theme among the retail suppliers is MOD introduced formal business practices that helped these entrepreneurs to learn to keep records and be better business managers. MOD did not push these individuals to over-expand but rather grow with the market demand. One fodder mentioned that he had a buy order during a MOD training but when it came time to deliver the person backed out.

### **5.4. Processors**

Four managers of processors were interviewed over Skype. Each representative spoke positively of MOD's impact on their business. One processor said all their field agents had attended two to three MOD trainings. MOD has gone beyond normal training practices. A common point was that they felt MOD's efforts will be sustainable because MOD has worked closely with processors rather than independently of them and works directly with farmers. They agreed that MOD is correct in developing input dealers to supply necessary inputs to dairy farmers, especially year-round quality fodder. They felt that the cost of feed must be reduced. Processors will want to establish their model farms, much like MOD has its DFs. These model farmers will be linked to a processor. MOD has a set of best practices, and producers need fodder and silage making as part of their operations. Farmers need to see how good management and proper equipment results in higher profits. These model farms need to have access to finance (even if it is only a minimum amount) to encourage expansion. Banks are an important partner in the program. Bankers need to see the best farms, too, in crafting loans. Processors are looking at ways with MOD to bring more investment and financing to dairy farmers. Processors are willing to work with producers and banks to help the producer service the loan from the regular milk check. One processor plans to hold training sessions with bank loan officers after COVID-19. Processors mentioned working with SAPP on loans for farmers. These model farms can be examples of small commercial farms that can have five – six cross-bred cows producing 50 – 100 liters per farm. Another processor would like to select farms supplying 25 l/d to double to 50 l/d by the end of MOD. Evening milk could be collected from farms, and better milk cans used rather than plastic would improve quality (a processor said only 20 – 25% of farmers are collecting evening milk). The events of the past year, poor feed and animal diseases, points to the fact that producers need more training on animal health, and this can be through the MOD training. The opportunity exists to establish mobile vet clinics. Processors would like MOD to continue to host workshops and go to farms after training with support services, assist with developing model farms, continue with refresher courses for their field agents, and stress quality of milk that meets international standards.

## **5.5. Financial Institutions**

Banks play a key role in the development objectives of MOD. Increased production can only come with access to quality inputs and some of these have to be bought on credit. MOD plays a role with processors to identify credit worthy farms. This helps lending officers to better decide on whether to lend or not. Bank loan officers are young and do not know the dairy industry. It is important to train and expose them to dairy operations. Bank officers see that the margins for milk can be good, but it requires good feeding, and it is important to control the cost of the feeding. Farms that can meet these criteria are in a better place to receive a loan. Banker did say that it is important for the quality of milk to improve and to meet international standards. One bank is working with two processors in the North Central Province to process 100 loans which are in the pipeline. The loan process started in 2019 as part of the SAPP project. MOD and processor staff have been very helpful. Even with this assistance, some loans were disqualified on minor technical grounds. This

could have been prevented and saved time if certain steps had been done early. The process of communicating between the bank, SAPP and the Central Bank can take time. If the bank has documents ahead of time, then this reduces the time. Banks want to engage with MOD and processors and more loans will be processed under SAPP with rates around 7 – 8% interest. The more MOD can train farmers about what their needs are will speed up the process. One banker said that obtaining insurance on the cattle is expensive but important for the producer and the bank to reduce risks. Bankers want the dairy industry to follow international standards. Producers will need to abide by commodity agreements with processors.

## **5.6. Trainers**

### **5.6.1. Technical trainers**

MOD conducted training of trainer workshops for over 115 individuals consisting of LDIs, freelance training professionals, and dairy processor extension staff in Module 1 and 2. Trainings focus on medication, feed, nutrition, supplements, and body condition score (BCS). MOD needs to do training at the DFs. Follow-up on-farm visits are “a must” and making a video to show at the DF at training is a good idea. Producers learn BCS and then see cattle firsthand on their condition. The producers better understands TMR and use of concentrate feed. A cost of feed per day is Rs. 40 per liter of milk so there is a margin. Farmers only have time from 9 am to 1:30 pm so need to be respectful of their time. Women and youth are two groups that have an opportunity in the dairy business so need training.

### **5.6.2. Business trainers**

MOD conducted TOT workshops for approximately 80 business trainers. From this group, MOD selected 12 to 15 trainers to conduct workshops on Module 3 and 4 for dairy producers and business entrepreneurs. The purpose of the training was to strengthen the business side of the dairy operation, make follow up farm visits, and help individuals to prepare loan request and a better understanding of income and expenses through basic bookkeeping

## **5.7. Government**

### **5.7.1. Department of Animal Production and Health (DAPH)**

DAPH officers began their relationship with MOD not sure what to expect. There was reticence on their part. But after the work began and they saw improvements in milk yields they became supportive. MOD extension methods are effective. Some officers were trained but are actually are not in dairy. One officer said more advance notice of the training would be helpful for planning for DAPH to assign people to attend. The development of linkages of dairy producers to input

suppliers is very important. MOD is supporting the DAPH in the districts and the assistance is appreciated.

### **5.7.2. National Livestock Development Board (NLDB)**

There are 31 farms in the NLDB system, and 25 are cattle farms with 10,000 head of cattle under management. NLDB has assisted in developing MOD TOT program and developing teaching materials for the trainings. NLDB sells milk to three processors as well as to its own milk processing unit for yogurt and other products. The coordination between MOD and NLDB is close with assistance provided, and NLDB wants it to continue for the remainder of the project. U.S. dairy consultants have visited the NLDB facilities. NLDB works with AIDA and sees its role as important to addressing the structural issues facing the dairy industry.

### **5.7.3. Artificial Inseminators (AI)**

MOD held refresher courses for almost 400 AI inseminators. The courses were informative with new techniques in handling and placing the semen and use of synchronization drugs. What is missing is better heat detection by producers since animals need to be serviced within 12 hours of estrus. One AI specialist does about 30 – 45 inseminations per month. A concern is that producers are inseminating old cows resulting in poor success rates, and the cows are not in best nutritional condition. Cattle better suited for the dry zone condition are crosses with the Sahiwal breed, The Friesian breed does not do well in a hot, humid climate. MOD has trained private AI inseminators but they cannot be certified because the government inseminators will not allow them to do practical training. Some processors even felt this was not proper. Private AI inseminators could work in the more remote areas where public sector AI do not work. MOD can continue to train Ais in both the public and private and eventually the barriers will be lifted.

## **5.8. Donor Programs**

### **5.8.1. ACTED**

ACTED is funded by EU and works in Central and Uva Provinces. One of the value chains is dairy and ACTED helps poorer households understand the dairy business and value addition. ACTED benefits from MOD's trainings and assistance on technical and business training for an underserved population that works on the tea plantations. MOD does a two-day training and provides a manual, which producers like. What is appreciated is the development of a business plan and a contingency plan in case some unforeseen event occurs, like a pandemic. ACTED staff remarked that two weeks after training the simple techniques taught by MOD increased the production and quality of milk. An important issue to address by MOD is improving the resiliency

of dairy households and this can be addressed through value addition of milk toffee, a local product with a long shelf-life.

#### **5.8.2. Smallholder Agribusiness Partnerships Program (SAPP)**

The International Fund for Agricultural Development funds SAPP, and the project ends in 2023. SAPP reached out to MOD on training its beneficiaries in the dairy industry. SAPP's aim is to create strong businesses, especially for women and youth. SAPP links producers/farmer organizations to the private sector, and MOD supports SAPP in this effort. MOD provides extension service which the government has trouble doing. SAPP targeted the Northwest Province as a good dairy area and asked MOD to assist in developing dairy producers. MOD will create a private sector supply chain of input suppliers to service these dairy farmers. SAPP's plan is that the cost of inputs will be paid from the revenue check from processors. SAPP and MOD will work with producers that are in clusters along the collection route.

## 6. FINDINGS

The team addressed a number of questions posed to the evaluation team at the start of the evaluation.

### 6.1. The Extent to Which Project Outputs Led to Expected Outcomes

MOD trained both public and private stakeholders, and these include extension agents for the dairy processors with MOUs with MOD. These trainings upgrade the skills of field agents to better address producers' needs, increase their rate of adoption, and produce more milk per cow. Producers increase their purchases of inputs from reliable MOD retailers of feed and veterinary supplies. Producers can be assured of the quality of these inputs rather than counterfeit products sold at a cheaper price found in the local markets. Producers can pay for these with proceeds from their milk sales. The outcome from the surveys is that MOD is achieving behavior change by producers and increasing milk production above the baseline. Women have been a direct beneficiary from the outputs and their standing in household and community is recognized.

An achievement of MOD is that working collaboratively with processors and AIDA is leading to a long-term development outcome of a stronger dairy sector. Dairy industry stakeholders come together around the table and discuss issues affecting their businesses. This openness creates the opportunity for the industry to tackle larger policy questions, such as role of imports, supply of feed resources, and milk quality. This was not the case before MOD, and the industry even struggled during periods of MOD because of the shortage of milk and poaching among the processors. AIDA emerged as a voice for the industry and has 21 paid members which includes international corporations, like Nestle and Fonterra, to speak to the GOSL.

Improvement in milk quality is a persistent challenge for the dairy industry. Processors have not made the investments needed in improving the milk quality chain. The milk collection system is still woefully under-invested by the processing industry. Milk quality is poor and so far there has not been a severe public health issue. MOD has conducted trainings with staff of several processors with a total of 128 individuals trained in best practices to improve milk quality.

MOD established a public – private sector advisory committee of processors, and the committee met twice to discuss input for a consumer campaign to drink milk. Until the GOSL takes a role in setting and regulating milk standards around quality, then it is unlikely that any change will occur (Interview with GDP consultants).

### 6.2. Activities Most Effective in Producing Outcomes

**Small and Medium-Scale Dairy (SMSD).** MODs most effective activities have been in training of producers of SMSDs. With the help of processors, MOD developed a system of identifying producers who meet the criteria (30 to 40 l/d l/d plus land) and are ready for MOD interventions. MOD holds trainings using the Modules 1 and 2 on simple practices. After the training, MOD staff visit producers at their farms to mentor and monitor the progress of the

producers. As a processor said, “MOD’s follow-up is what makes the training program so successful.” MOD field staff will check in by phone regularly with the producer to see how things are going.

MOD’s designation of DF works well in the training plan. A training is held at a DF. This arrangement builds trust between producers and the processor which is important in establishing market contracts between buyers and sellers (Activity 4). The dairy enterprises linked to businesses via either inputs or outputs is significant for MOD stakeholders. A DF producer receives recognition, and producers appreciate the recognition. Another benefit seen is the spread effect. One DF producer introduced us to his neighbor, who he is advising. The younger farmer is growing forages for sale with instructions from the DF producer. The indirect benefits from MOD training are significant with neighbors and others dropping in to tour a farm.

**Large-Scale Dairy (LSD).** MOD works with LSDs to improve their business performance. At the start of MOD, LSDs were starting but because of poor planning for feed, farms went bankrupt. MOD works with 14 LSDs, and U.S. dairy consultants and volunteers have spent weeks at a dairy advising these operations. It is important that a few large dairy enterprises are profitable and are a source of large volumes of milk from a dedicated supplier. In the first six-months of Year 3, LSDs supplied 11,879 MT of milk (37% of the total amount of milk reported to USDA for the period). At the close of MOD, LSDs are projected to supply 30% of the volume of milk (26,346 MT). These LSDs are becoming more viable enterprises with MOD’s assistance.

**Small-scale entrepreneurs.** MOD’s support to private small businesses is vital to their communities including development of commercial fodder cultivators, silage enterprises and commercial input retailers. These businesses create direct and indirect benefits and puts liquidity into the area. Wheel Master and Prima are also supporting entrepreneurs to supply them seed for the cultivation of superior forages.

### **6.3. Effectiveness of Project Reaching Targets (timewise and per the work plan)<sup>4</sup>**

MOD has been beset by a number of negative events out of its control that will prevent reaching some indicator targets. Despite these events, MOD is meeting 15 of the 22 indicators; and for some indicators, it has surpassed the target set for the project. MOD’s approach remains effective, but it will have to reduce targets for the following indicators.

**Land.** MOD faces issues on land put into improved forage production because of softening of producers’ demand and risks associated with drought and army worms. Land is being put into new forages of CO3 and Sorghum – sugar graze but it is a slow process. MOD will have to reduce the target for the amount of acreage.

**Volume of milk.** The FMD outbreak (2019/2020), army worms (2018), and continued drought and flooding have affected the supply of milk. MOD producers will not meet the targets set in the PMP. MOD trainings introduced farmers to improved practices which will make them more resilient to negative climatic occurrences.

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<sup>4</sup> This section draws on a PowerPoint presentation provided to the evaluation team by MOD’s senior management.

**Loans.** MOD provides financial services, yet banks are slow to loan to dairy farmers because of non-payment on loans. MOD needs educate loan officers on how to assess good loan applications rather than lumping all dairy producers as a poor credit risk. MOD is diversifying possible lending agencies, such as SAPP. It will be necessary to reduce the number of loans and the value of loans. MOD is recommending adjusting to the number of loans to 1,430 and the value of loans to USD \$1.6 million. Even with these changes in targets, MOD will need to host workshops for bank loan officers.

**New Public-Private Investments (PPI).** A number of macroeconomic setbacks have dampened the investment climate in Sri Lanka. Devaluation of the currency, terrorist acts, and change in political party control has turned investors away from Sri Lanka and the dairy industry. Delays in the MOD funds have meant the funds were not available to be used as a catalyst and attract/leverage investments. The target for PPIs will need to be reduced and a possible revised target is \$8.43 million, and at the mid-way point, PPI is \$3,970,635.

**Investment Fund.** MOD is to receive US\$2 million from USDA from monetization of commodities. SEAF will manage these funds. Though the funds have not been transferred, MOD and SEAF have carried on preparatory activities so they will be ready when the funds arrive.

#### **6.4. Relevancy of the Project Activities to Beneficiary Needs and the Local Context**

The relevancy of all project activities is high. MOD builds on a value chain approach so that stakeholders are identified, engaged, and trained. MOD strengthens the dairy value chain from input dealers to final consumers in business basics (Module 3 and 4). They carry out mentoring and monitoring. Sarvodaya works alongside IESC's local MOD team. Sarvodaya's work in M&M is another example of keeping the business of dairy continually in front of producers and others in the dairy value chain.

In the evaluation survey, MOD producers were asked to indicate which activities were relevant to make significant progress (Table 5.1.). Respondents said overwhelmingly that it was MOD trainings, followed by on-farm discussions, and then mentoring sessions. MOD producers said these MOD interventions made significant improvements. MOD has a coherent and relevant approach to engage its stakeholders.

**Table 6.I. Effective MOD Interventions to make significant progress**

|                                            | #                   | %       |
|--------------------------------------------|---------------------|---------|
|                                            | <i>n=135</i>        |         |
| Trainings                                  | 135                 | 100.00% |
| On farm discussions                        | 86                  | 63.70%  |
| Mentoring sessions                         | 71                  | 52.59%  |
| Preparations of action plans               | 37                  | 27.41%  |
| Preparations of business plans             | 36                  | 26.67%  |
| Other                                      | 4                   | 2.96%   |
|                                            |                     |         |
| Improvements were significant - Yes        | 128                 | 94.81%  |
| Improvements were significant - No         | 5                   | 3.70%   |
| Improvements were significant - Don't Know | 2                   | 1.48%   |
|                                            | <b><i>n=135</i></b> |         |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

Producers said in interviews that MOD trainings introduced key technical and business concepts which improved their dairy enterprise. One of the most useful interventions was how to calculate their profit from dairy. The calculation of gross margin showed the amount of profit that could be made and how they can better control their costs and improve the quality of their milk. The MOD trainers reported producers for the first time understanding the potential income they can make if they follow the technical advice in Module 1 of the training program (Give the example of the interview with MOD trainer).

The work by MOD to strengthen AIDA is relevant on several levels. First, AIDA supports the dairy industry as an advocate for removing barriers to commercialization of the industry. The Chamber of Commerce supports AIDA and its members in the business community, and this provides AIDA agency among its peers. AIDA's development allows for a platform for the association members to discuss issues that would be hard for an individual company. AIDA can address issues to the government rather than one-off discussions by a single firm.

## **6.5. Project Resources Being Used Effectively**

MOD senior staff work effectively with IESC home office to properly manage project resources. As delays in initial funding from USDA occurred, together they were able to operate on a limited budget to move activities forward and be ready to launch once funds came on-line. MOD carried out a number of assessment/scoping studies in preparation of project activities.

In terms of effort, MOD allocated 10% of its portfolio at the government level (limited by not having a MOU). MOD put 20% of effort to processors, and 70% of effort is to producers and entrepreneurs. This allocation is both appropriate and balanced given that MOD is tasked with developing a market-oriented dairy industry.

MOD has made effective use of volunteers on topics of importance. MOD's use of these volunteers has resulted in good Value for Money (VFM). IESC has a requirement to provide \$136,651 in cost

share. To date, MOD has surpassed this figure through provision of volunteer labor. Total cost share contribution is US **\$165,481** through March 30, 2020, so 120% over target already.

The IESC budget figures for MOD are listed in Table 6.2. Year 1 has a surplus because of the delay in IESC receiving the majority of its fund until late in the fiscal year because of the delay in monetization of commodities. There was an unspent amount in Year 1 of US \$2,179,671. In Year 2, the budget was US \$3,121,257 and the amount spent was US \$2,462,266 with an unspent amount of US \$658,991. For the first two years, there is US \$2,838,662 in unspent budgeted funds. Of this unspent amount, US \$2,000,000 of the underspent funds was originally budgeted for starter capital for the Investment Fund to be managed by SEAF under Activity 3, and was budgeted to be spent in the Year 1-2 time period. IESC is still planning to complete this activity and use US \$2,000,000 to fund the Activity 3 Investment Fund once their second commodity monetization has occurred. Even though the Investment Fund has not been funded yet, project funds were spent by SEAF in Activity #3 to conduct an Investor Forum to get momentum started for Activity #3 and the Investment Fund. After the removal of the \$2,000,000 for the Investment Fund there is a positive balance of US \$838,662 to be carried into Year 3 and beyond. This balance is due to a slower than anticipated start-up of activities due to a delay in their first tranche of monetization. IESC is aware of this unspent balance and the IESC and MOD staff plan to increase the spending rate in Year 3 to spend the surplus of US \$838,662. MOD is on sound financial basis.

**Table 6.2. Budget, expenditures and unspent funds for MOD Project (US\$)**

|         | Budget Year 1 | Budget Year 2 | Total Year 1 & 2 | Budget Y3, Y4, Y5 |
|---------|---------------|---------------|------------------|-------------------|
| Budget  | 4,461,085     | 3,121,257     | 7,582,342        | 6,427,657         |
| Spent   | 2,281,414     | 2,462,266     | 4,743,680        |                   |
| Unspent | 2,179,671     | 658,991       | 2,838,662        |                   |

The combined budget for Years 3, 4, and 5 is US \$6,427,657. With the time remaining, the average spending rate will be US \$2,142,552 per year which shows a normal back-end decline in budget as the project begins to come to the end. It is believed that budget year five will require less spending of project close down and the scheduled end of the project in March 2022.

## 7. PROJECT MANAGEMENT

### 7.1. Effectiveness of the MOD Team

MOD staff received positive comments from partners and stakeholders on their management skills. An often heard comment was the extra effort MOD staff took in maintaining close, open communications. Senior management of processors and banks meet regularly with MOD staff, and dairy executives have come to see the value of MOD and its field staff. Trust is building between the processors and dairy producers. MOD senior technical staff clearly want beneficiaries to improve.

*“I have now been in the dairy sector for 18 years in Sri Lanka. Trainings for farmers have become a very trivial activity and no one really give serious consideration for them. They have become something so insignificant -- just like having a meal. The major reason for the success of the trainings managed by MOD was that they went beyond the orthodox approaches.”* Managing Director, dairy processor.

A highly competitive environment existed recently for processors because of the shortages in the supply of milk. MOD has been balanced and transparent in its workings with all processors during this period which helped to convince executives to join AIDA and, in some cases, adopted approaches introduced by MOD.

Internally, MOD field staff, who are responsible for carrying out the planned activities, reported that they have regular weekly meetings with senior management. Bi-weekly meetings are held to review project activities. Field staff said this was a useful forum for sharing progress. Field staff did mention the heavy burden on collecting PMP data, as well as, advising beneficiaries. Producers are confused about the demand on their time if MOD is not advising.

#### **Box. 7.1. MOD’s Influence on Processors**

A processor has adopted KPIs into their field team’s performance reviews and a processor is working with banks and identifying farms to invest which is similar to MOD. MOD has influenced many processors to pursue SAPP Funding for their dairy farmers.

### 7.2. Skills and Capacity of MOD staff and its partners to work effectively

MOD is composed of five implementing partners: IESC, University of Florida (UF), Sarvodaya, and GDP, and SEAF. Interviews were conducted with representatives of each organization about MOD’s capacity to conduct the activities. Positive reports were received that the MOD technical staff was competent and also willing to accept new ideas to improve the training and advising of MOD recipients.

### 7.3. Effective Use of Project Resources

MOD does not provide grants or monetary incentives to beneficiaries. Training, mentoring, and monitoring support producers in their improvement. Interviews with producers found an interest in grants or other direct assistance. For some, this project policy goes against expectations of what other donor and government projects that offer incentives or cost share with producers.

MOD uses volunteers who have spent time at mainly mega farms, supported AIDA, and carried out a cheese short course. The services and products received from these volunteers have been appreciated by those firms and organizations that benefited from their support. The Chairman of AIDA took time from his position as CEO of a dairy company to travel for one week with the fodder volunteer and the project manager. This shows a commitment to MOD.

In regard to VFM, MOD exemplifies a project that has good staff, consultants and volunteers to achieve its target outputs. The staff is motivated and has adequate access to office space, vehicles, and trainings to produce quality outputs. The outcome is skilled entrepreneurs in the input space, educated dairy producers (small, medium, and large), processors with better field staff, and a platform for policy dialogue to improve the dairy industry after MOD is completed.

The project got off to a slow start because of the delay in funding from the monetization. Actual producer-level field interventions and training commenced in January 2019, just over a year or so ago. The impact was felt on the partners, like UF, which could not engage until the last two months of the first project year. The project is now on a healthy spending rate and needs to continue with its appropriate burn rate to complete the project funds at the end of MOD.

**Table 7.1. MOD budget and expenses**

|                           | <b>Years 1 and 2</b> |               |                | <b>Years 3, 4, and 5</b> |
|---------------------------|----------------------|---------------|----------------|--------------------------|
|                           | <b>Budgeted</b>      | <b>Actual</b> | <b>Balance</b> | <b>Budgeted</b>          |
| Program Management        | \$3,168,822          | \$3,107,084   | +\$61,738      | \$2,658,188              |
| Activity 1                | \$597,304            | \$410,328     | +\$186,976     | \$820,660                |
| Activity 2                | \$370,757            | \$253,798     | +\$116,958     | \$564,305                |
| Activity 3                | \$2,217,674          | \$233,028     | +\$1,984,645   | \$432,429                |
| Activity 4                | \$162,319            | \$53,946      | +\$108,372     | \$326,504                |
| Activity 5                | \$379,398            | \$166,769     | +\$212,629     | \$603,291                |
| Activity 6                | \$154,205            | \$53,418      | +\$100,787     | \$218,386                |
| Surplus (+) , Deficit (-) |                      |               | +\$2,772,105   |                          |

Note. The indirect cost for program management are included in the amounts. The indirect costs for the activities in years 3 – 5 is UD\$803,894.

Activity #3 has two sub-activities: MOD investment fund and assistance to banks. The MOD investment fund has not been activated but other activities are on-going which is identifying, procuring, and contracting by SEAF. SEAF conducting a financial assessment of the market; SEAF setting up a MOD fund administratively; SEAF launching publicly with MOD the investment fund; and SEAF identifying potential investors and conducting due diligence.

## **7.4. MOD's Internal Dynamics and Areas for Management Improvement**

### **7.4.1. Data collection and reporting**

During the 3rd-Year reporting period, MOD was able to implement all the core functional modules of the monitoring and management information system. The database system supports MOD's

collection, analysis, and reporting on M&E indicators, and data provide information for management planning and decision making. Based on the changing requirements to the system, it is expected that some new functionalities (remote access, reporting tools, and enhancements) may be incorporated during the latter part of the reporting year.

A challenge in data collection is that producers generally do not keep records on their milk revenues and costs for the dairy enterprises. MOD addresses this issue by requesting processors provide 6-month data on MOD producers on the volume, price, FAT and SNF of their milk. MOD staff using processor data can assist producers to better track their herd's performance, and data can be used for preparing a loan request. More complete dairy herd performance data informs producers of their herd dynamics, as well as gives information on an individual cow basis. By knowing these financial data, investments made by producers can influence advising and training needs. In the larger picture, the data can reveal differences by agro-ecological zone and distance to markets. The work by Sarvodaya can benefit from the data collected to support its M&M program with producers.

MOD conducts an extensive data collection process for reporting on USDA's 22 indicators. In interviews with staff, some mentioned that the collection can disrupt the on-going field activities. Therefore, two findings are to have more flexibility of field offices to follow some of the evidence they find important. Second, there is a need to dig systematically into the wealth of information being collected for analysis and allocate time for staff to reflect on the findings in a learning process and then make necessary adaptive changes. This can be done with the assistance of SRL and its statisticians.

#### **7.4.2. Collaborating, Learning and Adapting (CLA) approach in MOD**

MOD has produced 21 success stories, 1 newsletter, 4 workplans, 9+ industry or organizational studies or assessments, 6 semiannual reports, and 50 biweekly communiques that have been shared with numerous individuals across the industry and donor community. The success stories, industry studies and newsletter have been publicly posted. These are learning products shared broadly outside of MOD.

Applying the CLA approach at the mid-term is an opportunity to assess what has been achieved and make mid-course corrections if necessary. For communications, MOD has assembled a strong set of partners who are able together to address the dairy context. MOD places emphasis on learning with regular six-month surveying by a third part to assess the effectiveness of program activities. These surveys allow for MOD staff to better understand the changes.

There needs to be more effort placed on learning from the M&E Data collected to better answer questions around producers' behavior changes in dairy as a business. This requires the time to reflect on what is being reported from the field by staff and from the data. MOD is adjusting as it finds evidence that producers are not fulfilling information taught in trainings.

#### **7.4.3. Outreach and communications**

MOD's primary focus is to ensure that the training materials are farmer-friendly, translated with correct tonality, easy to understand, and consistent with USDA and IESC branding guidelines

established for the project. MOD created the Dairy Entrepreneur Development Program and the Commercial Fodder Cultivator Development Program. MOD ensured that all UF training materials were translated to both local languages (Sinhala and Tamil) accurately. The success stories published by MOD are entertaining and informative and send a positive message to stakeholders.

#### **7.4.4. Field offices**

The senior staff, after researching the relevant dairy shed in Sri Lanka, decided upon three regional offices. The office planned in Batticaloa in the Eastern Region was moved to Dambulla as a more effective place. The three offices in Kandy, Dambulla and Vavuniya are well distributed to reach the primary dairy production zones and link to processors.

#### **7.4.5. Sub-awards and sub-recipients**

The sub-awards and sub-recipients for MOD are a good fit. Sarvodaya has strong track record in rural development to carry out the M&M of dairy producers, fodder cultivators and retail input suppliers attending the MOD training modules. UF is an implementing partner, and it has professors from the Department of Animal Sciences to address dairy nutrition and dairy enterprise management. UF is a leading animal science school based in tropical environment similar to Sri Lanka. UF professors and staff have developed an online forum (Tapatalk) for managers of LSDs to ask dairy questions about nutrition requirements and feed rations for their dairy animals. In this unusual time of the Covid-19 pandemic, Tapatalk is very important to addressing real-time problems with fast replies from dairy professionals.

GDP has a strong connection to the global industry and the consultants for GDP are knowledgeable in both dairy and strategic management issue for AIDA. SEAF is a debt/equity firm established in 1989 with a track record of working on investment funds using USDA monetization. The Investment Fund will have \$2.0 million seed capital provided by the project once the final monetization is completed, hopefully in fiscal year 2019/2020. IESC has assembled a group of specialist organizations that together will advance the dairy industry in Sri Lanka.

In the time remaining, MOD and its partners and key stakeholders should address those areas where MOD is not meeting its target indicators. These are: area of land cultivated under new technologies, volume, and value of milk from beneficiaries, number of loans and value of loans, number and value of loans disbursed, and value of new private sector investments. An area of focus can be the banks to offer training to loan officers, guided tours of local dairy farms, and new loan instruments specifically for dairy.

### **7.5. USDA Commodity Monetization**

The delay in monetization of the commodities to fund MOD caused difficulties for the project management to meet the expected targets. First, the monetization of the funds was delayed which meant a slow start-up in rolling out all the activities. Even now, into the third year not all the commodities have been received, and there is an unspent balance for Activity 3 of \$1,984,645 (see Table 7.1.). Only 39,800 MT of the planned 47,000 MT of wheat has been delivered and sold.

Additionally, the sales agreement with the buyer in Sri Lanka was for the full expected tonnage amount, and they are expected to receive the balance. IESC has discussed this issue with USDA and anticipates that additional commodity funding will be available in 2020 to allow the project to procure and ship the balance of wheat due to the buyer. MOD staff worked with SEAF which will manage the investment funds to conduct preliminary assessments of investment opportunities in the dairy sector.

## **7.6. Support from external stakeholders, USDA, GoSL and Private Sector**

The delay in USDA's monetization of commodities to fund MOD continues to present challenges for the implementation of the project. IESC and MOD staff were resourceful in managing the delay or shortage in funds. Skeleton activities were carried out in the project areas so that when the funds finally were deposited, work was on-going though scaled back. This action helped to keep the stakeholders engaged in MOD during the first year of the project

There has been mixed support by the GOSL. At the national level, MOD faces a situation, out of its control, in the delay in signing the MOU between the GOSL and the USG. Though a MOU has not been signed, MOD continues to communicate with departments below the national level to solicit their support and involvement in trainings and other interventions. The provincial offices of DAPH have been willing to participate in MOD activities. DAPH extension agents, LDOs and LDIs, and AI personnel attend MOD TOT trainings and assist in producer trainings. These government agents support interventions that improve dairy operations.

MOD staff realize that the delay in the signing of the MOU affects the sustainability of its outreach activities, like Saviya. Saviya is a cost effective means of reaching dairy producers with timely technical information. The telecommunication company, Dialog, has raised the issue with MOD staff that an agreement between the USG and GOSL is needed to ensure continuity in its digital platform for communicating information with dairy producers.

The dairy processors play a key role in identifying their producers to participate in MOD's trainings. MOD requested names of producers supplying at least 25 l/d and that had at least one acre of land available for forage production. MOD found that the number of producers who match these requirements is below the numbers projected in the baseline analysis. Consequently, MOD is having to consider working with smaller size dairy operations. MOD has 4,744 farmers registered divided into two groups: 1,826 producers of >30 l/d, and 2,918 producers <30 l/d. MOD has trained 3,097 producers and 70% of these produce >25 l/d. MOD is allocating its resource more heavily directed at the producers with greater potential to increase milk production.

MOD is finding that processors are focusing on sourcing milk rather than developing producers' capacity. Field staff is looking for milk from its existing producers, even poaching from their competitors, rather than focusing on increasing milk production from the pool of currently viable producers. Processors have not done enough to assist MOD in solving the production problem by directing the processors' extension agents to closely work with MOD field staff. Another example is the lack of coordination between government ministries and MOD to address constraints to

fodder production. In the last several months there seems to be a current willingness for greater coordination (Interview with MOD consultant.)

## **7.7. External Factors Impacting MOD**

MOD has been beset by a number of external factors outside its control. These factors have been environmental, social, political, and economic. MOD staff have been nimble in moving from each hot spot and finding a work-around solution when possible.

### **7.7.1. Environmental**

Sri Lanka has incurred the impacts of climate change with a long drought and at the same time floods. This has reduced the supply of milk and resulted in processors poaching milk from dairy farmers who supply other processors. The processors' field staff have been in a poaching mode instead of a proactive milk development mode. This situation is getting better in the last few months according to some processors. MOD staff has chosen to remain separate from this situation and carry on with trainings, though processors' field staff have been distracted.

### **7.7.2. Social – security impacts**

Sri Lanka underwent a social trauma with a terrorist attack in 2019. The attack resulted in a slowdown in the economy for a period as measures were taken to understand why the events occurred. A follow-on effect was that investors (domestic and international) considering Sri Lanka and the dairy industry drew back. This loss of security impacted the PMP indicators on investments made in the dairy industry. A second security breach was the outbreak of FMD which closed parts of the milk shed to MOD activities and the appearance of army worms in the maize and sorghum crops which affected silage makers who were unable to get the raw material.

### **7.7.3. Political**

A new government was formed and transition to the new appointees in the various ministries is underway. The political situation is having a direct effect on MOD because the GOSL has not signed the MOU with the USDA and the USG. MOD staff, while finding the situation frustrating, are looking at side channels to work with DAPH in the regions and this has been effective. Senior management of MOD is hoping the situation resolves in the next few months after the parliamentary elections which were supposed to be in April but are now postponed until June 2020 at the earliest.

### **7.7.4. Economic**

A number of economic issues have beset Sri Lanka. The exchange rate devalued from Rs.150 to USD \$1 to now in March 2020 at Rs.180/USD \$1. The impact has been that imported equipment, machinery, food (dairy products), packaging, etc. is more expensive. The cost of capital has increased and dairy loan programs by the Central Bank for loans of 6.5% have been replaced with commercial lending rates at 13- 14%. Dairy producers have faced banks which have tightened their requirement for dairy loans and available loan amounts have declined to less than Rs.200,000.

The U.S. – China trade disputes have likely impacted the full monetization of commodities planned for Sri Lanka and funding MOD and SEAF. The lack of these funds has stifled the opportunities to make investments which now are on hold.

#### **7.7.5. Critical assumptions made in the Results Framework**

In IESC’s proposal, it documents a number of critical assumptions, which if happened, could negatively impact the success of MOD. A number of these assumptions did not hold and events beyond MOD’s control negatively impacted on the project.

1. GOSL prioritizes milk production. This has partially happened as GOSL has allowed producer prices to rise during the period of MOD to reflect the higher cost of imported dairy products. However, The GOSL has not signed the MOU with the USG, and it continues to place barriers for the dairy producer with water and land rights.

2. Political environment was projected to remain stable. This has not been the case with change in government which proved to be contentious. GOSL’s departments are reluctant to address dairy issues at the present time until a new government and parliament are in place.

3. The fall in the exchange rate and result on growth prospects projected to be 5.1% in 2017 to 2019 have not approached this target. In 2020, the COVID-19 pandemic will certainly see a fall in gross domestic product due to reduced economic trade.

4. The successful launch of the OPIC Investment Fund has been on-hold because the full monetization of U.S. commodities has not occurred. It is not certain when the funds will be available. MOD has worked with other loan schemes such as SAPP to facilitate lending to dairy farmers.

### **7.8. Progress Towards Project Sustainability/Graduation**

Though the MOU between the GOSL and the USG has not happened, MOD is pursuing a number of relationships to ensure sustainability and graduation beyond MOD.

#### **7.8.1. Department of Animal Production and Health (DAPH)**

MOD Senior staff, realizing the delay in the signing of the MOU was dragging on, decided to work in the zones of influence in the key milk sheds with provincial and district DAPH officers. MOD trained 311 DAPH personnel on AI. Also 50+ DAPH vets attended intensive MOD ToT programs. MOD also trained 88 DAPH vets on dairy management, milk quality and business basics. MOD also initiated work with DAPH on breeding and mobile extension (Saviya). Members of the evaluation team interviewed DAPH officials in several regions and districts, and DAPH officers said MOD work is appreciated because these officials lack resources from the national office. For example, a Director in a district in the Northern Province said they lacked resources to fund the required number of veterinary officers in their district.

#### **7.8.2. Dialog**

Interviews with staff at Dialog found that the MOU is needed for Dialog to work with MOD on content material for Saviya. At this time, Dialog may not engage with DAPH on the Saviya program. MOD's senior staff are looking for alternative partners to sign on to Saviya to continue content material after MOD. Dialog officials hope this situation will improve in the coming months.

### **7.8.3. AIDA**

MOD is supporting the dairy industry association. The strategic plan developed by AIDA with assistance from GDP will ensure that the dairy sector will speak with one voice to the GOSL. The CEOs of major dairy processors are members of AIDA. With further assistance by GDP, AIDA will be in a strong position by the end of MOD to represent the dairy industry.

### **7.8.4. Processors**

Interviews conducted with four dairy processors revealed their change in attitude to the benefits provided by MOD. These processors now envision carrying on field trainings, setting up model farms, facilitating bank loans and other activities. The processors have come to realize they need to provide quality advisory services to their dairy farmers rather than poaching milk from other processors. The private sector has moved forward with MOD pushing them, and it is working.

### **7.8.5. GOSL and its departments**

GOSL is s a weak link at present without an MOU. However, the partners above will ensure that MOD's activities will remain strong to support a viable modern dairy industry. AIDA is certainly in a position to reach out to GOSL representatives as it does now to keep them informed on activities and key policy issues that GOSL needs to address, such as standards for milk quality.

The National Livestock Development Board (NLDB) is a government entity with 25 livestock farms. MOD provided volunteer support and training to upwards of 50 of their farm managers. MOD is providing direct technical assistance through our senior technical team. The MOD volunteer from Wisconsin spent time with NLDB staff and visited their dairy farms.

## 8. LESSONS LEARNED

MOD staff reported several important lessons learned from its activities.

1. At the start of the project, a number of studies examined the context of dairy production and the relationship with crop production. Better understanding about farmers' cropping systems and their dependence on rice production helped define the appropriate producers. MOD understood early the synergies between crop and dairy systems to be exploited. The forage consultant mentioned that Sri Lanka's climate allows forage production in some place to be year-round.
2. MOD mapped the milk catchment areas for different processors to better plan how to effectively deliver its services. MOD changed its placement of regional offices to be more responsive to both producers and processors based on the mapping. Geographic positioning of key assets: retail input suppliers, milk routes, DF, producer clusters, collection points and chilling centers helped to address the issue of high cost of transportation of fodder and milk and how milk quality declines because of lack of cooling. MOD data assisted processors to invest in cooling facilities which improves the milk quality.
3. Producers said they appreciated MOD's training programs, and they reported attending several MOD trainings. A large number of producers had not received training from a DAPH officer in the last year. Producers, trainers, and processors appreciated the follow-up of MOD field agents and business trainers after the training. Several producers and trainers said that classroom training needed to be moved to the DF for direct observations of good dairy practices. DFs are a logical site for these trainings. An LDI trainer for MOD said he would like to show videos on the wall of a producers' home. Trainers agreed that more experiential training is better than classroom theory.
4. To date, MOD has registered 4,744 dairy farmers in the program. Of this number MOD has trained 3,097 farmers. MOD will reach its target of 5,400 farmers; however, it will likely not meet the target of 87,820 MT of milk produced at the end of project. The problem is the number of producers producing 39.6 l/d is lower than first estimated. Because processors must recommend producers, MOD is dependent on processors to find the producers who meet the criteria for entering MOD's training program. The lesson learned is for more field research with the project team to provided better estimates on numbers of farmers meeting the criteria rather than relying just on processors.
5. MOD's training program is very effective with the added emphasis on M&M activities with producers. MOD works with producers to guide them in setting their goal, preparing an action plan, and allocating the necessary resources to achieve their goal. The lesson is that farmers need the consistent attention and advice in the early phases of their commercial development because as stated by the Wheel Master staff, "the farmer can quickly fall back into old habits at the first

misstep.” For example, an elephant destroys a forage field then the farmer will become discouraged and return to harvesting roadside grasses.

6. MOD has 40 staff members to cover a large and diverse geographic area with beneficiaries scattered across the landscape. MOD cannot be everywhere engaging with farmers. MOD needs to adopt a more participatory action approach (PAR) which places producers, their leaders and DFs leading the activities to address a problem, such as feed. Group sharing of knowledge reduces dependency on MOD personnel and its limited resources. Rather than relying on advisors coming to producers on a regular basis, it is better if producers organize within a cluster to further explore and test improved methods when advisor is not present. These clusters become participatory action farmer groups (PAFG). A group has a leader (which could be for the DF in the area), and the group plans and arranges for visits by MOD, retail input suppliers, and others.

7. MOD learned from the Wave\_1 field data that farmers are not tracking their cost of production. They rely on dairy companies or their collection center of their farmer association to keep records on production, prices paid, and percentages of FAT and SNF of their milk. Recordkeeping remains an issue for most dairy producers, possibly because of the lack of formal training in recordkeeping. This lack of understanding and not keeping records allows collectors, chilling centers, and processors to take advantage of producers.

8. MOD trains both public and private sector AI specialists. These specialists said that MOD introduced new techniques to improve their success rates of insemination. The government controls the supply of certain inputs/services which prevents a competitive and efficient delivery of services. Barriers exist in animal health, breeding services, access to land and water. The GOSL provides free or heavily subsidized services preventing the entry of private individuals to compete in the market. MOD’s challenge is to strengthen indigenous organizations to have the capacity to advocate for change in their communities. MOD’s support of AIDA is an opportunity to address the barriers created by GOSL’s policies.

9. MOD has been beset by a number of external events outside its control ranging from political, acts of terrorism, drought, floods, FMD and army worm infestation. At the time of the evaluation, the COVID-19 pandemic halted all field activities. The lesson learned is that producers have a low level of resilience to these external shocks. MOD can advise on ways to mitigate risks and uncertainties through better planning. Farmers were asked if they save any portion of the money received from sales of milk (Annex 4.24). Women saved slightly more than men, 52% versus 48%, but overall, the propensity to save is low. Without savings, a household is vulnerable to unexpected events and can be forced to liquidate productive livestock. Another risk to producers are animals dying. More than one person said they had a sudden die off of dairy cows. Animal health is an issue, and the health of the cow relates directly to its milking performance from improved feeding.

## **9. RECOMMENDATIONS FOR REMAINDER OF THE PROGRAM**

MOD is successful in a number of its project activities: Activities 1, 2, and 6 are making good progress and exceeded targets. Activity 4 is an ICT pilot to link buyers and sellers, and the platform will link buyers and sellers in dairy animals for sale, veterinary certificates for cattle movement, AI services and other types of exchanges. Activity 5 is on-going but no significant change in milk quality as measured by somatic cell and bacteria. The evaluation team did find a positive correlation between MOD practices and FAT and SNF levels in milk. Prices to farmers did increase overall for MOD and N-MOD farmers because of the period of milk shortages. MOD's interventions are moving the dairy industry forward in the correct direction.

Part of Activity 3 remains partially constrained by the delay in the final monetization of U.S. commodities. The Investment Fund is waiting on commodities to be monetized so not fully operational, but other activities in the activity on access to finance and SEAF's assessments and promotions are moving forward with the disbursement of funds. The other part of the activity is the work with SAPP and the four banks which resulted in high numbers of beneficiaries receiving financial services but has not resulted in expected number of loans. MOD needs to work more closely with the four banks in training of their loan officers, loan application tools, and providing guided tours of dairy farms for loan officers. MOD needs to continue to strengthen the stakeholders in the dairy value chain and ensure that the linkages between up-stream and down-stream actors are working with agreed upon product standards for improved contracting of milk.

The "global" recommendation is for the MOD team to continue to strengthen all parts of the dairy value chain. Project resources are limited, but MOD can engage on key issues at each stage through its surrogate organizations and partners. This requires continuing with the key stakeholders and to get their buy-in based on how you allocate your resources. Modernization is underway with MOD's activities, and the recommendation is to continue to focus on integrating components of the dairy market system. The evaluation found that three key factors shape the success in dairy production:

- Dairy nutrition,
- animal health, and
- market links.

The supply of available feeds/nutrients for dairy cattle is going to have to be increased through the use of chemical fertilizers and legumes. Animal health requires MOD's increased attention. The FMD outbreak was a "call to action" that dairy nutrition and animal health go "hand in hand." The veterinary services to producers need to be improved according to a DAPH official.

“Ultimately, the dynamic force underlying longer-term expansion in animal production will be economic growth. This factor will create the demand for livestock products necessary to stimulate producer interest in technological progress related to animal production.”<sup>5</sup>

The following recommendations support the continued achievements of MOD. The boost in milk production will come from two segments of producers: (i.) SMSDs and (ii.) LSDs. Each group has its own unique opportunities and challenges.

**Rec. #1. Small and Medium-Scale Dairy (SMSD).** SMSDs will be the group to achieve significant increases in volumes of milk. MOD needs to continue to focus on the dairy enterprises of 30 l/d and above as stated in the Agreement for the remainder of the project. MOD can work with producers to boost production to the level of 60 to 80 to 100 l/d.

**1.1. MOD’s Training Program.** MOD’s participatory approach of training, action plan, business plan and mentoring and monitoring is an intensive approach that is boosting of milk production. MOD continues to focus training resources and M&M on the producers producing above 30 l/d. Those producers below are encouraged to visit DFs and MOD can give printed materials and encourage them to visit Saviya for information.

**1.2. Establish more Demonstration Farms (DFs).** The use of DFs for training is important, and small cash grants would be a nice complement to reward producers’ efforts and use of their farm facilities. (Note: the biosecurity at the DFs needs to be improved to reduce the spread of disease when hosting trainings). MOD needs to set a target of 100 DFs by December 2020.

**1.3. Support Processors’ Plan for Model Farms (MF).** In interviews with executives at dairy processing companies, they said they plan to support producer-owned model farms. This processor activity is proactive, and this initiative fits seamlessly with MOD’s DF. These model farms would qualify to receive technical advising, minimum sets of equipment, short-course dairy training, and financing with a participating bank. The processors would service the producers’ loan with banks from a portion of the producer’s regular milk check. Processors could set up a loan program for its most trusted producers.

**Rec. #2. Large-Scale Dairy (LSD).** MOD currently works with 14 LSDs. Seventeen other LSDs could be brought into MOD’s sphere of influence. In the two years remaining, volumes of milk can increase from these large dairy enterprises. The major challenges are availability of feed, health, and the higher costs of milk production. Two U.S. dairy consultants spent time with several LSDs and identified areas for improvements. Professors at the University of Florida recommended to focus on per cow milk yield rather than the herd yield. Several tasks:

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<sup>5</sup> De Boer, A. John. (1982). “Livestock Development: The Asian Experience.” In *Livestock in Asia*. IDRC. Ottawa.

**2.1. UF professor.** The applicable UF professor make more trips working with the LSDs and a contract nutritionist from the region to complement the UF professor when not in Sri Lanka.

**2.2. Tapatalk.** The Tapatalk platform is an online forum developed by UF staff to assist owners and managers of LSDs to address dairy nutrition problems. Managers can ask technical questions and UF staff will respond with answers. Tapatalk is a platform that when made accessible to LSDs will offer critical information to improve feed rations and milk production. Tapatalk needs to be fully up and running for LSDs within four to five months and for SMSDs in nine months.

**2.3. Dairy Nutritionist.** MOD can contract with a dairy nutritionist from the region who can make regular visits to advise LSDs on feed rations and dairy cow performance. The nutritionist will visit farms and take feed samples and do ration formulation. This specialist would make a 10 day visit to dairies every eight weeks and be available for phone consultations when not in Sri Lanka. The dairy nutritionist would work closely with the professors at UF who have agreed to visit Sri Lanka more often.

**2.4. Owners and General Managers of LSDs.** A group of dairy enterprise owners and managers visit to the U.S. to tour large commercial dairy operations. UF professors and graduate students in the Dairy Science Department at UF would plan and host the group. If travel to the US is too problematic with visa, cost and the current pandemic, the group could travel to India, Pakistan or other countries in region to visit LSDs and milk processing facilities. The reason to visit is to view the operation of modern, commercial dairies in the region.

**Rec. #3. Up-stream suppliers of inputs and services to dairy producers.** The following stakeholders would continue to be strengthened.

**3.1. Processors' field agents.** MOD continues to provide refresher TOT training for these field agents. Shortages of milk have distracted processors, but this situation has improved recently. Processors need to be active in organizing producer meetings, training sessions, follow-up visits and on-site guidance for dairy producers.

**3.2. Government extension agents.** MOD continues to do training-of training (TOT) sessions for DAPH agents who then in turn train other government agents and producers. MOD needs to improve TOT training with modules using ICT to convey information to trainers. Production of videos and ICT can be used to train groups of farmers at DFs.

**3.3. ICT.** Dialog's Saviya program is a cost-effective program with good VFM reaching large numbers of dairy producers with timely information. MOD needs to ensure that Saviya will be sustained after MOD by arranging for a partner in public or private sector to continue the work with Dialog. A MOU is necessary between the three parties of IESC/MOD, DAPH, and Dialog to ensure that Saviya continues after the close of MOD. Saviya and ICT tools would be instrumental in supporting the under 30 l/d producers who are not getting the larger amounts of resources targeted to the producers with 30 l/d.

**3.4. Veterinary field agents.** MOD needs to closely engage with the regional veterinarians on animal disease surveillance and prevention. The focus would be on FMD, disease prevention

and early detection, surveillance, diagnostic and remediation of disease. Veterinary interventions are closely linked to improved nutrition, improved milk quality, and lower rates of mastitis. Producers require a management plan, e.g. inoculations, etc.

**3.5. Artificial Inseminators (AI).** MOD needs to introduce new practices for better conception rates, such as warming the semen for greater motility and then deeper insertion of the semen into the uterus. MOD needs to offer training to both public and private AI technicians.

**3.6. Commercial forage producers and silage makers.** The number of these entrepreneurs are increasing but slowly, and outreach with M&M needs to continue. MOD can subsidize the seed cost of improved forages in the first year of the intervention.

**3.7. Input dealers.** MOD needs to continue to support Prima for supply of quality seed and other inputs, Wheel Master for farm equipment, suppliers of minerals and concentrates. MOD needs to encourage companies to attend producer trainings and demonstrate their goods and services.

**3.8. Dairy Exposition.** MOD is successful with its annual Dairy Exposition. The event draws participants from the public and private sectors. Companies include manufacturers, wholesalers, and dealers who display their products and services. The Exposition needs to include veterinary services, dairy cattle breeders, and dairy equipment suppliers.

**Rec. #4. Downstream services for improvement of milk quality.** The quality of Sri Lankan milk is not up to international standards, and for this reason there needs to be renewed interest to improve the collection, transport, and chilling of milk. Producers in the field survey said they would collect and sell their evening milk. Processors need to expand evening milk collection for their producers.

**4.1. Cold chain.** MOD continues to address quality issues in milk through trainings of producers, transporters, collection, and chilling centers with the goal for improved milk quality.

**4.2. Collect evening milk.** Producer interviews found interest in selling evening milk. MOD needs to initiate a pilot test with processors to collect and chill evening milk using motorcycles, 3-wheelers, or mini-trucks with participating chilling centers

**4.3. Management Information Systems (MIS) data.** Work with processors to improve the collecting, storage, and retrieval of producer data on milk volumes, prices, and FAT and SNF and merge with Wave survey data.

**4.4. Management of effluents.** MOD needs to stress in trainings the appropriate ways to manage effluents from the dairy barn. Field visits found unhygienic conditions in many sheds. Sheds are located near residence so opportunities created for contamination in the household. As a sign of appreciation, MOD could give gum boots to producers who adopt better hygienic dairy practices. Dairy producers require more training on biosecurity of their dairy farms.

**Rec. #5. Access to finance for dairy enterprises.** MOD has signed four MOUs with banks and an agreement to cooperate with SAPP, Suwashakthi, and other donor supported programs. MOD can support efforts by processors and others to lend to credit-worthy dairy businesses.

**5.1. Training.** MOD can conduct training sessions with the bank loan officers of the four banks with MOUs with MOD. Trainings will include the opportunities with dairy farms, and loan officers will visit farms.

**5.2. Business tools.** MOD can develop a business analysis tool for quick evaluation of a dairy farms seeking a bank loan. MOD can grade the farm and the producer on several financial tests. If farm is found to have a poor credit rating, then MOD can develop a plan to return the producer to solvency within a set time period. This service is for producers producing +30 l/d.

**5.3. SAPP and other programs.** MOD continues to collaborate with SAPP, ACTED, and other small-grants program for dairy producers. The granting organization can break the log jam for loans to small-holder dairy operators.

**5.4. Business consultant.** MOD can contract with MOD business consultants to guide a dairy farmer from pre-loan analysis to loan agreement with a financial institution. Payments to consultant are based on achieving milestones in the loan process. The largest payment to consultants would be with the loan application approved and funds disbursed. The consultant will advise the producer through the first six months after the loan is approved.

**Rec. #6. Dairy School for Young Dairy Farmers.** Processors said that the dairy industry faces a problem of lack of young farmers entering commercial dairy operations. MOD needs to encourage young men and women to become dairy farmers. Milk processors want to create model farms owned and run by young dairy farmers. These processors will nurture these new entrants. MOD can support a public-private initiative to train a new generation of dairy farmers. It could be called a Young Farmers Dairy School and patterned after other dairy schools in the USA and New Zealand. The program would involve a local university. AIDA could also support this initiative.

**Rec. #7. Value added dairy products.** MOD conducted a cheese making short course, and MOD can continue to offer these short courses to milk cooperatives and others making specialized dairy products. In interviews, it was learned that there are small clusters of dairy farmers that are producing specialized dairy products. MOD can support these dairy initiatives and would fulfill Food for Progress Intermediate Result (IR) “Increased Use of Improved Post-Production Processing and Handling Practices” (FFPr 2.1.2.1.) Many projects are women-focused and offer opportunities for increased household income and improved nutrition with dairy products.

**Rec. #8. AIDA.** AIDA is developing as the major voice for the dairy industry, and its future is promising. MOD assists AIDA in preparing plans and presenting them to GOSL for government assistance and cooperation. Some areas for additional support to AIDA are:

**8.1. Young leaders.** Representatives of companies in AIDA are the owners of the dairy processors. MOD can encourage a program to involve other company staff besides the CEO. These staff would be specialists in dairy technology and marketing to them strengthen the workings of AIDA.

**8.2. Strategy papers.** MOD can support AIDA's general manager to further expand the number of working papers on water, fodder, human nutrition, young farmer school and other topics that support the industry.

**8.3. Milk promotion.** MOD can support AIDA in a milk promotion program educating the general public on the importance of drinking milk. Certain demographic groups can be targeted.

**8.4. Seal of quality.** MOD can support AIDA by working with industry to address milk quality standards. This can be done with the idea of an industry seal of quality. The GOSL will want to be engaged in setting the standards, testing and regulations. A CEO of a dairy processor said,

*"Yes, I think it is very important thing (improve milk quality) and it is possible. However, someone needs to play the central role. I think MOD is in a better place to do that. Or else AIDA (All Island Dairy Association) could play that role. I think there is strong need to get everyone (public and private) around one table for that, otherwise we will go into a crisis of milk quality." Dairy processing company executive.*

**8.5. Expand membership to include dairy producers.** MOD and its sub-contractor, GDP, needs to encourage AIDA to include paying members from the milk production societies and cooperatives. Their presence in AIDA would present the needs of producers. When a processor was asked about producer membership, he said that processor can best represent producers. This is not likely.

**Rec. #9. Monitoring and Evaluation (M&E).** MOD has a strong M&E staff and they conduct thorough and systematic collection of project performance data. They are focused on reporting on the PMP indicators. There is an opportunity to dig deeper into MOD's rich database to examine changes in producers' behavior, especially around MOD's interventions and new practices.

**9.1. Analytics of Ten Best Practices.** The evaluation found that MOD's 10 best practices extended to farmers have a positive effect on milk production, percentages of SNF and FAT, and prices of milk paid to farmers. MOD working with SRL needs to further examine the data to look at predicting performance of producers that will transition successfully to be commercial dairy farmers. Processors are providing volume, price, and quality data on producers' milk. This processor data merged with the producer Wave data can guide the MOD staff in better understanding what is working in its training and outreach programs. MOD can coordinate with SRL to run cross-tabulations and associations between adoption and other variables in the Wave databases.

**9.2. Counterfactual.** MOD needs to continuously sample a group of non-MOD producers to track them as a control group to assess MOD's impact on dairy producers. The findings will be reported in the semi-annual reports.

**Rec. #10. Forage and Fodder Research.** Producers said that feeding dairy cattle is a major problem. MOD does not have a research mandate; however, the Ministry of Agriculture and its allied departments can play a more proactive role in developing long-term, innovative research programs that address constraints in forage and fodder production for the Sri Lankan dairy producers. MOD can advise on the types of research and how the public and private sectors can support market-oriented dairy production units in depressed areas.

**10.1. Forage and fodder.** There are new varieties of forages that farmers can plant. Some forage varieties are drought tolerant. There needs to be on-station and on-farm testing.

**10.2. Farming systems.** Research on synergies between crop and dairy systems is needed to advise producers how to optimize the two activities for higher yields and include forages and legumes in their agricultural mix of products.

**10.3. Risk analysis.** Dairy farmers face risks from both weather and animal diseases. SMSD operators do not have a high levels of resilience to withstand uncertain events. When an event occurs, these farmers suffer financial losses, and they are prone to return to old habits, e.g. collecting grass from roadsides or exiting dairy altogether. MOD needs to advise farmers on how to adapt to these changing conditions.

## 10. ANNEX

### 10.1. Scope of Work for Market-Oriented Dairy Midterm Evaluation (Terms of Reference)

#### Background

The International Executive Service Corps (IESC) is the prime implementer of the five-year, \$14.01 million Food for Progress Market-Oriented Dairy (MOD) project in Sri Lanka, which is funded by the U.S. Department of Agriculture (USDA). The project period of performance began on September 5, 2017 and ends on September 30, 2022.

Dairy is the most critical livestock sub-sector in Sri Lanka due to the growing demand for fresh milk and milk products and the sector's potential to grow the rural economy. Today, just over 30 percent of fresh milk demand is met locally. The MOD project is supporting Sri Lanka's dairy sector through the following objectives:

- Increase agricultural productivity in the dairy value chain through improving the availability of inputs for dairy farmers in a way that can be sustained beyond donor support; and,
- Increase trade of dairy products by improving food safety and quality at the local level and targeting interventions aimed at market-oriented farmers seeking to grow their businesses.

In partnership with the private and public sector, MOD will increase milk production of participating farmers and farms from 38,525 metric tons to 87,820 metric tons by 2022—an average annual growth of 18 percent, for a life of project growth of 127 percent. The project will help 80 percent of beneficiary farmers earn higher prices than before the start of project interventions due to improved milk quality.

High level life of project expected results are as follows:

- 15,184 individuals benefiting directly from project-funded interventions
- 45,553 individuals benefiting indirectly from project-funded interventions
- US \$35,168,119 in sales by project beneficiaries
- 87,820 MT of commodities sold by project beneficiaries
- 80 percent of beneficiary farmers earning higher prices than before start of the project interventions due to improved milk quality

These results will be achieved through the project's six main activities:

- **Activity 1 – Capacity Building: Agricultural Extension Agents/Services:** focuses on strengthening the ecosystem of agricultural extension services reaching dairy farmers to increase dairy productivity.
- **Activity 2 – Inputs: Develop Agrodealers and/or Input Suppliers:** develops the dairy input sector and increases the amount of inputs, including quality animals, fodder, and silage available to dairy farmers.

- **Activity 3 – Financial Services: Leverage Public and/or Private Investment:** increases investment in Sri Lanka’s dairy sector, both through the establishment of an investment fund and by providing assistance to financial institutions to encourage lending in the dairy sector.
- **Activity 4 – Market Access: Facilitate Buyer-Seller Relationships:** facilitates relationships between buyers and sellers of inputs in the dairy sector, as well as develops market linkages for dairy farmers seeking to move from the informal sector to the formal sector.
- **Activity 5 – Training: Sanitary and Phytosanitary Standards:** improves the quality and safety of milk produced in Sri Lanka, increases the demand for safe milk at the local level, and introduces new market-based incentives for meeting quality standards.
- **Activity 6 – Capacity Building: Trade Associations:** strengthens the nascent All Island Dairy Association.

The project is being implemented in the following provinces of Sri Lanka:

- Northern Province (Jaffna, Kilinochchi, Mullaitivu, Vavuniya, Mannar)
- North Western Province (Kurunegala)
- North Central Province (Anuradhapura, Polonnaruwa)
- Eastern Province (Trincomalee, Batticaloa, Ampara)
- Central Province (Matale, Kandy, Nuwara Eliya)
- Uva Province (Badulla, Monaragala)

## Purpose and Scope

In compliance with USDA’s monitoring and evaluation (M&E) policy, MOD will conduct a Midterm Evaluation. The midterm evaluation will “critically and objectively review and take stock of the project’s implementing experience and environment, assess whether targeted beneficiaries are receiving services as expected, assess to what extent the project is on track to achieve its stated goals and objectives, review the results frameworks and assumptions, document initial lessons learned, and discuss necessary modifications or mid-course corrections that may be necessary to effectively and efficiently meet the stated goals and objectives.”

As specified in regulations (see 7 CFR Part 1499.13, 7 CFR Part 1599.13, and 7 CFR Part 1590.13), this evaluation will be independent and conducted by a third party. Specifically, the regulations specify that the third party conducting the evaluation:

- Is financially and legally separate from the organization (International Executive Service Corps);
- Has demonstrated knowledge, analytical capability, language skills and experience in conducting evaluations of development programs involving agriculture, education, and nutrition;

- Uses acceptable analytical frameworks such as comparison with non-project areas, surveys, involvement of stakeholders in the evaluation, and statistical analyses;
- Uses local consultants, as appropriate, to conduct portions of the evaluation; and,
- Provides a detailed outline of the evaluation, major tasks, and specific schedules prior to initiating the evaluation.

Independence of the evaluation function from program implementation and management is a core principle of USDA evaluation. Independence helps to ensure both credible and objective evaluations. USDA-supported evaluations should be conducted by people who are not involved in the implementation and management of the project, and the evaluation process must be free from political influence and organizational pressure. For external evaluations, all evaluation team members will provide a signed statement attesting to a lack of conflict of interest, or disclosing any real or potential conflicts of interest.

Monitoring and evaluation activities should appropriately balance the desired creation of evidence with the protection of human subjects, including safeguarding the dignity, rights, safety, and privacy of participants. Evaluators are responsible for applying ethical principles in all stages of the evaluation, and for raising and clarifying ethical matters with stakeholders during the course of the evaluation.

The evaluation will examine both administrative and programmatic aspects of MOD. The evaluation will also assess whether issues with the project's commodity monetization impacted or changed project implementation and performance. The MOD midterm evaluation team will include the following positions: team leader, technical coordinator, a midterm evaluation administrator, and enumerators. Each position has a detailed scope of work.

### **Key Evaluation Questions**

The questions below will shape the midterm evaluation. The evaluation team may modify these questions or add additional questions to gather data related to the project indicators listed in the PMP, as reported by IESC. The evaluation team will review these questions prior to the evaluation to improve clarity.

- Are project resources being used effectively?
- How relevant are project activities to beneficiary needs and the local context?
- How effectively is the project reaching its targets; both timewise and per the work plan?
- To what extent are project outputs achieved leading to expected outcomes in the dairy sector?
- What activities are most effective in producing these outcomes and why?
- Which activities, if any, need to be expanded, modified, or dropped?

- How effective is the implementing team in Sri Lanka? Does the staff and implementing partners have the skills and capacity to carry out their work effectively?
- Are the internal dynamics of the project sound and productive?
- In what ways might project management and implementation be improved?
- To what extent is progress being made towards project sustainability/graduation, and what could be done to strengthen the sustainability of project activities and results?
- What are the external forces that negatively and positively impacted the project implementation and how did the project attempt to overcome, mitigate or capitalize its impact?
- If external forces impacted the project implementation, what were the effects of this impact on different stakeholders (project staff, commercial farmers, small dairies, etc.)?
- Were there any issues with the project's commodity monetization that resulted in delays to the project implementation or the altering of planned project activities, and if so, what was the impact of this on different stakeholders?
- Did the project get appropriate support from external stakeholders such as the USDA, GoSL and private sector? If it did not, how did the project try to overcome these challenges and what was the impact?
- What are the key challenges in collecting data and information and how did the project overcome or mitigate?
- Have recommendations from the baseline evaluation been incorporated into the project and if not, why not?

## Methodology

The MOD midterm evaluation team will develop an evaluation work plan and will operate based on this work plan, employing a variety of qualitative methods (focus groups, key informant interviews, direct observation) and quantitative methods (e.g., secondary data analysis such as national statistics from the Department of Census and Statistics, Sri Lanka Department of Animal Production and Health (DAPH), as well as MOD partner data from their dairy value chains) that are appropriate to the proposed interventions. USDA staff, relevant project participant staff, and key stakeholders should be considered on the list of key informants for the MOD project.

Key MOD stakeholder categories and thus those that will be interviewed include:

A. Direct MOD beneficiaries: dairy farmers, input retailers, commercial fodder cultivators, dairy processors, AIDA members and extension officers;

B. Control groups: NGOs who implement dairy projects in Sri Lanka, Non-MOD dairy farmers, Government institutions (Not partnering with MOD), and Non-MOD input retailers;

C. Key local stakeholders/facilitators: MOD staff, USDA staff, MOD trainers, Dialog, AIDA Secretariat, Banks, DAPH, NLDB, Ministry, and MOD consultant and volunteers; and

#### D. MOD Sub Partners: GDB, UF, Sarvodaya, and SEAF.

In addition, the MOD midterm evaluation team will interview beneficiaries per the determined sampling methodology, with the M&E team conducting beneficiary surveys as specified in the MOD Performance Monitoring Plan (PMP); these are standardized program reporting forms utilized to collect beneficiary data on a semi-annual basis for project reporting. MOD project staff and field support staff will assist with site visit coordination once the evaluation team determines the sample of beneficiaries to visit, including providing contact data of beneficiaries and sensitizing beneficiaries to the evaluation (telling them that they may be contacted by evaluators, that IESC supports the evaluation, and to be open and candid with evaluators). MOD will employ local field support enumerators to reach all targeted collaborating organizations and a minimum stratified sample size calculated by the total anticipated beneficiary population. To avoid conflict of interest or appearance of conflict of interest, the team leader will determine sampling pool, sampling instructions, oversight of enumerator work, and complete the analysis of enumerator gathered data. Per prevailing U.S. government standards, MOD will disaggregate all data collected by gender. The evaluation will be conducted in an ethical manner to protect the dignity, rights, safety, and privacy of participants.

The midterm evaluation is scheduled for the first half of Year 3, February to April 2020). The evaluation phases are as follows:

**Stage I:** Prepare Terms of Reference (TOR) and Select External Evaluator (6 months before project midpoint, October 2019). LOE: 2 days (MOD)

The IESC home office (HO) will prepare a TOR outlining the purpose and scope of the evaluation, specific issues or questions to address in the evaluation, prospective approach and methodology, work plan and scheduling of the evaluation, ethical considerations, and evaluation management and structure. MOD will submit the TOR to USDA for review and approval. Once the TOR is approved and circulated, IESC will review proposals to implement the TOR from qualified evaluators, including consultants based in the U.S. and Sri Lanka with appropriate qualifications and prior experience with USDA or similar evaluations.

**Stage II:** Desk Research (2 months before evaluation, January 2020) . LOE: 15 days (5 days for team leader, 5 days for technical coordinator, 5 days for midterm evaluation administrator)

The selected evaluation team will review the MOD agreement and modifications, approved Evaluation Plan and PMP, Baseline Study, Semiannual Reports, Work Plans, USDA M&E Policy, relevant secondary data, and any other relevant documents. IESC home and field office will provide documents. The evaluators will outline any data gaps or areas for further investigation, outline field visit plans, and prepare the work plan, which IESC will then review. IESC will provide the evaluators with necessary support from both HO and field offices, and final approval to begin the subsequent stages. The team leader will liaise with IESC to recruit for enumerators; IESC will post the job descriptions and the team leader and IESC will interview and select the enumerators.

**Stage III:** Preparation of Field Research Tools (1 month before project midpoint, February '20), LOE: 5 days (team leader)

The evaluation team leader will design and develop the primary data collection tools. These tools may include questionnaires, focus group or interview guides, and data analysis and validation methodologies to gather information.

The Evaluation team will independently prepare, propose and utilize appropriate tools for each group above A-D. The following types of data collection instruments are anticipated:

Direct beneficiary interviews (Random or other sampling techniques based on MOD database, use structured/ or semi structured questionnaire), Direct field observations / photos, and key stakeholders/ leadership/ technical and admin staff members interviews. Also, evaluation team leader can use combined above scientific research methods or case studies for each group as necessary.

The data collection tools may utilize quantitative or qualitative approaches. Qualitative methods will include semi-structured interviews, direct observation, focus groups, key informant interviews, and random spot checks (visits to collaborating partners and target beneficiaries). The team leader will choose a sample of beneficiaries depending on the tools and methodologies. The team leader will interview and select enumerators for the data collection. They will further develop the initial in-country schedule, that includes name, organization, objective, date and estimated time of meeting/interviews and share it with the project office for assistance in planning logistics and meeting coordination with stakeholder or beneficiary. The team leader will work with IESC's field representative to plan and coordinate all the necessary logistics for the qualitative and quantitative collection of data at the field level and translate, pre-test, and finalize data collection tools.

**Stage IV:** Field Research Data Collection (March 2020), LOE: 75 days (15 days team leader, 15 days technical coordinator, 15 days midterm evaluation administrator, 15 days per each of two enumerators)

The evaluation team leader will travel to IESC's Sri Lanka project office in Colombo and conduct an orientation session with the local MOD team members and an internal collaboration session amongst the MOD midterm evaluation team. IESC anticipates that the midterm evaluation technical coordinator, midterm evaluation administrator, and enumerators will be Sri Lankan nationals and will assist with the data collection and translation (e.g. in-depth interviews, focus groups, etc.). The team will spend approximately three weeks in the field collecting, reviewing, and validating data. The local midterm evaluation team members will undergo a brief training by the team leader to ensure accurate understanding of evaluation purpose, duties, and consistency in data collection techniques, and will comply with IESC's code of ethics and standards of behavior.

**Stage V:** Data Analysis and Report Preparation (Midterm Report 2 months after midpoint May 2020), LOE: 10 days (team leader), 8 days (technical coordinator), 5 days (midterm evaluation administrator)

Upon completion of the data collection and field visit, the midterm evaluation team leader will compile, clean, and analyze all data collected and then prepare the detailed report outlining the purpose of the review, methodology, primary observations and findings, lessons learned to date, and recommendations. The findings must be compared to and measured against baseline data. The

midterm evaluator team leader will present IESC home-office MOD project management unit and MOD senior management with these materials and then will prepare the final report with proper attention given to IESC's feedback. The final reports will be submitted to USDA for review, approval, and discussion.

## **Deliverables**

The final midterm evaluation deliverables from the evaluation team include the following:

1. Write a Midterm Evaluation Work Plan, which includes the following:
  - A demonstrated understanding of the program based on desk review and kick-off meeting
  - Midterm evaluation methodology including detailed sampling plan, field work plan, and any limitations of the proposed approach
  - Planned quality control measures
  - Communication protocol with interview talking points related to purpose of interview, the project, and consent for participation and/or inclusion of subject in photographs captured during the study
  - Final timeline
  - A Gantt chart reflective of the narrative that includes action, timeline by week, output, team owner, IESC support if required
2. Provide the electronic copies of all clean and final versions of data collection tools, both in English and Tamil
3. Provide clean and final versions of quantitative datasets and qualitative transcripts in agreed upon format
4. Provide electronic draft midterm evaluation report in English, addressing all evaluation objectives and questions. The report will be in Microsoft Word in a standard IESC MOD report template. The report is estimated to range from 30 to 40 pages (excluding the annexes included in the below list). It must include the following:
  - List of acronyms/abbreviations
  - Table of contents
  - Executive summary
  - Background
  - Detailed evaluation methodology
  - Program Database Audit
  - Findings
  - IESC response to findings
  - Suggestions and requests from beneficiaries
  - Recommendations for the remainder of the program
  - Annexed scope of work
  - Annexed overview of performance for each indicator

- Annexed export statistics
  - Annexed data collection instruments
  - Annexed org chart
  - Annexed CV of team leader
  - Annexed photographs from meetings with farmers and focus groups (please note that any person photographed should provide consent for their photograph to be taken regardless of whether the photograph is included in this Annex or in the evaluation report)
5. A 2-3 page stand-alone brief describing the evaluation design, key findings and other relevant considerations. It will serve to inform any interested stakeholders of the midterm evaluation, and should be written in language easy to understand by non-evaluators and with appropriate graphics and tables
  6. Deliver an oral presentation supported by PowerPoint slides and any applicable electronic handouts the evaluation findings in the IESC MOD template. The presentation should be an hour and include 20 to 25 slides. An initial review shall be completed in-country at the completion of the field assignment, the final presentation delivered at the completion of the report.
  7. Produce 15 to 20 high-quality pictures of the process, which are date and time stamped (please note that any person photographed should provide consent for their photograph to be taken regardless of whether the photograph is included in this Annex or in the evaluation report).
  8. Produce electronic English version of the final evaluation report in PDF and MS Word, as well as two printed copies in color (one for USDA/SL and one for the MOD office). The final version of the evaluation report will be made publicly available on the Development Experience Clearinghouse (DEC). The final version of the midterm evaluation report should NOT include the following information, which may necessitate submitting both an internal and a public (revised/redacted) version of the report:
    - Proprietary information owned by third parties.
    - Information that could put individual safety at risk or personally identifiable information (PII). PII is information that can be used to reasonably infer the identity of an individual, directly or indirectly.

## **10.2. Work Plan – Mid-Term Evaluation of the Market-Oriented Dairy Program**

### **1. Purpose of the Evaluation**

The midterm evaluation will inform IESC (as the project's implementer) of MOD about performance of the project to date in order to identify priorities and strategies for the remainder of the project. This will improve the overall project's performance and outcomes. IESC will critically and objectively review and take stock of:

- the project's implementing experience and environment,
- whether targeted beneficiaries are receiving services as expected,
- what extent the project is on track to achieve its stated goals and objectives,
- review the results frameworks and assumptions,
- document initial lessons learned, and
- discuss necessary modifications or mid-course corrections necessary to effectively and efficiently meet the stated goals and objectives.

The evaluation will examine both administrative and programmatic aspects of IESC's dairy project in Sri Lanka. The evaluation will also analyze monetization procedures and cost recovery calculations.

The findings of the evaluation will be presented to the USDA. IESC will share relevant results of the midterm to stakeholders in the public and private sectors, including certain direct project beneficiaries (e.g., Ministry of Mahaweli Agriculture, Irrigation and Rural Development (MAIRD) and Partner Dairy Processors (PDP) and IESC's sub recipient partners on this project, The University of Florida (UF), Global Dairy Platform (GDP), Small Enterprise Assistance Funds (SEAF) and Sarvodaya (SY).

### **2. Research Questions**

The questions below will shape the midterm evaluation. These questions (and others) relate to the project's Project Management Plan (PMP). This set of questions (and others to be added) will be reviewed for clarity and bias based on conditions in the field.

- How relevant are project activities to beneficiary needs and the local context?
- How effectively is the project reaching its targets; both timewise and per the work plan?
- To what extent are project outputs achieved leading to expected outcomes in the dairy sector?
- What activities are most effective in producing these outcomes and why?
- Which activities, if any, need to be expanded, modified, or dropped?
- How effective is the implementing team in Sri Lanka? Does the staff and implementing partners have the skills and capacity to carry out their work effectively?
- Are the internal dynamics of the project sound and productive?

- In what ways might project management and implementation be improved?
- To what extent is progress being made towards project sustainability/graduation, and what could be done to strengthen the sustainability of project activities and results?
- What are the external forces that negatively and positively impacted the project implementation and how did the project attempt to overcome, mitigate or capitalize its impact?
- If external forces impacted the project implementation, what were the effects of this impact on different stakeholders (project staff, commercial farmers, small dairies, etc.)?
- Were there any issues with the project's commodity monetization that resulted in delays to the project implementation or the altering of planned project activities, and if so, what was the impact of this on different stakeholders?
- Did the project get appropriate support from external stakeholders such as the USDA, GoSL and private sector? If it didn't, how did the project try to overcome these challenges and what was the impact?
- What are the key challenges in collecting data and information and how did the project overcome or mitigate? Have recommendations from the baseline evaluation been incorporated into the project and if not, why not?

### **3. Methods**

The evaluation team will employ both qualitative and quantitative methods which will engage project staff, beneficiaries, and stakeholders. The process will be participatory; therefore, IESC staff will support the evaluation, and the evaluation will involve and incorporate input from:

- government officials in the Department of Animal Production and Health (DAPH) and the National Livestock and Development Board (NLDB),
- dairy farmers, demonstration farms and commercial fodder cultivators
- input providers such as input retailers, silage enterprises and AI technicians,
- financial institutions such as banks and SAPP,
- private sector partners such as dairy processors, Dialog, Prima and Wheelmaster,
- AIDA secretariat and members, and
- other relevant stakeholders such as trainers and local and international consultants.

The evaluation will employ a mix of approaches:

- systems analysis of the dairy value chain and what element of the dairy system results in effective dairy development,
- outcome harvesting to identify activities that most effectively led to outcomes and long term impacts,
- participatory action research to involve beneficiaries in the evaluation process, and
- Utilization-Focused Evaluation (U-FE) that is client-oriented to deliver findings that will be useful to MOD staff.

These approaches will employ both qualitative methods (field surveys, focus groups, key informant interviews, direct observations) and quantitative methods (field surveys, secondary data analysis such as national statistics from the Department of Census and Statistics, Sri Lanka Department of Animal Production and Health (DAPH), as well as MOD partner data of their monitoring and evaluation of dairy value chains.

### **3.1. Sampling methodology**

Evaluation team will consist of international team leader and short-term national consultants to reach all targeted collaborating organizations. The ET will reach a minimum stratified sample size of stakeholders calculated by the total anticipated beneficiary population. Per prevailing U.S. government standards, the ET will disaggregate all data collected by gender.

The preferred way to interview will be in-person interviews. Other interviews may be by phone or email or skype. The interviews will be complemented by data in the PMP and semi-annual reports. The sample will include:

1. Agricultural extension agents (public and private)
2. Agro-dealers and input suppliers (breeding cattle, AI, vet, feed/fodder)
3. Financial lending intermediaries
4. Market linkages between buyers and sellers (milk and other ag/dairy inputs)
5. Quality and Safety Standards trainers
6. Dairy associations – All Island Dairy Association (AIDA) and Chamber of Commerce

MOD project staff will assist with site visit coordination once the external evaluator determines the sample of beneficiaries to visit, including providing contact data of beneficiaries and sensitizing beneficiaries to the evaluation (telling them that they may be contacted by evaluators, that IESC supports the evaluation, and to be open and candid with evaluators). However, MOD staff will not accompany evaluation team members to interviews so to protect respondents' statement made in confidentiality.

The evaluation team will review and test the field data on a regular basis and then utilize the data generated from IESC's internal reporting systems, beneficiary surveys, and stakeholder interviews. The evaluation team will ask that monitoring and evaluation (M&E) staff fully document the methodology and process used for collection, recording, and maintenance of data on project indicators. The request is that they share this documentation, along with a sample of the source documentation, with the evaluation team, so that reliability of the data can be validated. The evaluators will supplement and verify the data MOD provides by conducting their own primary data collection.

## **4. Tasks**

The evaluation includes five tasks: desk research and work plan, evaluation team selection, field research tools, field research, data analysis, and report writing.

#### **4.1. Desk research and Work Plan (WP)**

A thorough review the project's documents will be conducted, and these will include: Results Framework, Theory of Change, Semi-Annual Reports; Case Studies; assessments prepared at the start of the six main activities (see the list above). A review will be conducted of relevant secondary data, including data from MOD's field activities. The evaluators may consult additional documentation from IESC's home office, MOD's field offices, or other relevant sources. Requests for further data will be conveyed to MOD and IESC's headquarters office staff. The desk research will support the development of the Work Plan (WP) and will be the formation of the research questions (see above). The formation of a Steering Committee was completed (see 6. Annex 1).

#### **4.2. Interviews of evaluation team members**

The MOD staff interviewed candidates for six positions: one technical coordinator, one administrator and four field enumerators (male and female). The interviews resulted in key people identified and waiting for them being contracted. The team leader will design the evaluation with support from the technical coordinator and the administrator. The administrator will work closely with MOD staff on logistics for the team. The administrator will share responsibility for overseeing the data collection and transcribing focus group interviews.

#### **4.3. Sample framework of stakeholders and beneficiaries**

The sampling plan is for a purposeful sample in which the data collected will address the research questions and the purpose of the evaluation. The plan includes people we want to interview. Interviews will be at specific locations and times of day and can be both on-farm or at key off-farm locations. MOD created demonstration centers, and these locations offer an opportunity to meet male and female producers, as well as other stakeholders in the value chain.

One purpose is to observe producers practicing improved skills they have learned because of MOD. Our sample will focus on market-oriented dairy farmers rather than small, subsistence dairy producers who are unlikely to be able to transition to become commercial dairy farmers in the life of the project.

In consultation with IESC staff, the team leader will plan the field activities and coordinate logistics for collecting qualitative and quantitative data. The following key stakeholders by activities will be surveyed (Table 1.). The dairy producers are a prime target because of MOD interventions to increase milk production and increase revenues from the sale of milk. It is expected that 100 small, medium and large dairy producers will be interviewed. In addition, other key beneficiary groups will include: fodder cultivators, silage enterprises, input retailers, AI technicians, MOD trainers, other extensionists, and AIDA secretariat and its members.

**Table 1. Stakeholders in the MOD program**

| Activities                                                                                                                                 | Number                                | Key Informants      | FGD | IESC M&E Database | Field Observations | Photographs n=20 |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------|-----|-------------------|--------------------|------------------|
| 1. Agricultural extension agents: MOD trainers, AI Technicians, dairy processor extension staff, LDIs and Dialog                           | 10 - 15                               | ✓                   | ✓   |                   |                    |                  |
| 2. Ag Input and services providers; input retailers, fodder cultivators, silage enterprises, AI inseminators, machinery and seed breeders. | 10 - 15                               | ✓                   | ✓   | ✓                 | ✓                  | ✓                |
| 3. Financial intermediaries; banks and SAPP                                                                                                | 2                                     | Personal interviews |     |                   |                    |                  |
| 4. Market access for sellers (male and female) and buyers (primarily dairy processors)                                                     | Approx. 110 sellers and 10 processors | ✓                   | ✓   | ✓                 | ✓                  | ✓                |
| 5. Milk quality standards: trainings of farmers, MOD trainers & processor staff                                                            | 10                                    | ✓                   |     | ✓                 | ✓                  | ✓                |
| 6. Capacity Building – Trade Association : AIDA secretariat and members                                                                    | 3                                     | ✓                   | ✓   |                   |                    |                  |

Note: Number of producer beneficiaries =110 which is based on 1700 in MOD current producers in activities., Confidence level 95%, confidence interval = 9%.

#### 4.4. Field research tools

The evaluators will design and develop data collection tools to collect field data. The data collection tools will be for both quantitative or qualitative approaches. Qualitative methods will include semi-structured interviews, direct observations, focus groups, key informant interviews, and random spot checks of stakeholders and beneficiaries. The evaluators will choose a sample of beneficiaries depending on the tools and methodologies to be used. The evaluation team will visit agro-dealers and dairy operations and will take at photographs.

It is important that the evaluation team have the necessary equipment to conduct evaluations. Some of the tools needed are;

- Cell phones (7). Each team member will use own phone and ET buy minutes.
- Hand-held tablets for entering field data and establishing GPS locations (6 tablets)
- Tape recorders for Focus Group Discussions (4)
- Notebooks, clip boards, pens and pencils (6 of each) (Administrator will purchase)
- Poster paper with tape and colored pens for team meetings
- Optional (mobile solar panels to charge phones and tablets at night)

#### 4.5. Field research

#### **4.5.1. Pre-testing research instruments**

The evaluation team will take two days to pre-test the questionnaires and interview guides for the focus group discussions. The training will be done at the initiation of the field work. The training will focus on purpose of the evaluation and steps to ensure accurate collection and reporting of data. Staff will be briefed on IESC's code of ethics and standards of behavior when conducting interviews.

#### **4.5.2. Field work**

The evaluators will travel to businesses and communities served with the MOD project to collect required data for project analysis. The team leader will work with MOD staff to plan and coordinate all the necessary logistics for data collection at the field level. The team will spend approximately three weeks in the field collecting data. The expectation is for 100 producers interviewed and 40 - 50 other beneficiary stakeholders.

#### **4.5.3. Ensuring data quality**

The team leader and technical coordinator will assess the quality of the data collected during the evaluation to ensure that findings are fulfilling the research questions. It is important that the data being collected is complementary to data (mix of qualitative and quantitative data) being collected by the M&E staff of MOD. The data must be of sufficient detail to measure the performance indicators. The data collected will be regularly examined to ensure its accuracy and precision. Finally, data will be collected and analyzed in a timely manner to inform the management team of MOD.<sup>6</sup>

#### **4.6. Data analysis**

The evaluation team will compile, clean and analyze data during the field research and continue after all the data collected during field visit. For the qualitative data, Computer Assisted Qualitative Data Analysis (CAQDAS) will be used to analyze the data. Interviews conducted will be transcribed and entered into the Atlas.ti 8 software program. Coding of the data will be done by the team leader with input from others on the team. The quantitative data will be analyzed using Excel and SPSS software. Data will be compared to and measured against baseline data and M&E data collected by MOD staff. The team leader will present MOD and IESC with these materials.

#### **4.7. Report Writing**

The team leader will prepare the draft report for IESC's feedback. The final reports will be submitted to USDA for their review, approval, and discussion. The team leader will undertake the following steps:

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<sup>6</sup> USDA. (2019). Monitoring and Evaluation Policy. Foreign Agricultural Service – Food Assistance Division. Washington, D.C.

- Prepare a detailed report outlining the purpose of the review, methodology, primary observations and findings, lessons learned to date, and recommendations in accordance to the requirements (see the suggested Table of Contents below).
- Deliver key findings and initial recommendations to MOD senior management team at the conclusion of the field assignment.
- Submit findings to MOD and IESC and address any comments within an agreed upon time period, not to exceed two weeks, and prior to the report's submission to USDA;
- Address any feedback, comments, or requests for clarifications from USDA within an agreed time period not to exceed one week.

The report is estimated to range from 30 to 40 pages (excluding the annexes included in the below list). The final report will include, but not limited to:

- List of acronyms/abbreviations
- Table of contents
- Executive summary
- Background
- Detailed evaluation methodology
- Program Database Audit
- Findings
- IESC response to findings
- Suggestions and requests from beneficiaries
- Recommendations for the remainder of the program
- Annexed scope of work
- Annexed overview of performance for each indicator
- Annexed export statistics
- Annexed data collection instruments
- Annexed organization chart
- Annexed CV of team leader
- Annexed photographs from meetings with farms and focus groups

## **5. Timeframe**

The timeline for the tasks of the evaluation is in Table 2. The majority of the days are allocated to the field work.

| Table 5. Gannt Chart for Mid-Term Evaluation of MOD    |                  |                  | Task       | Team         | Admin        | Tech Coord   | Enum.        | IESC  |
|--------------------------------------------------------|------------------|------------------|------------|--------------|--------------|--------------|--------------|-------|
| Tasks                                                  | Start Date       | End Date         | Period     | Leader       |              |              |              | Staff |
| Task 1. Desk Review and work Plan                      | 2/11/2020        | 3/1/2020         | 19         | 3.50         |              |              |              | xxx   |
| Task 2. Interview and select team members              | 2/17/2020        | 2/20/2020        | 3          | 0.25         |              |              |              | xxx   |
| Task 3. Research Questions                             | 2/20/2020        | 2/24/2020        | 4          | 0.00         |              |              |              |       |
| Task 4. Sampling Frame - notify participants           | 2/25/2020        | 3/5/2020         | 9          | 0.25         |              |              |              | xxx   |
| Task 5. Survey tools                                   | 2/25/2020        | 3/5/2020         | 9          | 0.75         |              |              |              |       |
| Task 6. Train enumerators                              | 3/9/2020         | 3/11/2020        | 2          | 2.00         | 2.00         | 2.00         | 2.00         |       |
| Task 7. Field work - KIIs, FGDs, Observations          | 3/12/2020        | 3/31/2020        | 19         | 18.00        | 18.00        | 18.00        | 18.00        |       |
| Task 8. Data Analysis                                  | 3/28/2020        | 4/20/2020        | 23         | 4.50         | 5.00         | 8.00         | 4.00         |       |
| Task 9. Report writing                                 | 4/15/2020        | 5/5/2020         | 20         | 4.25         |              |              |              |       |
| Task 10. Report Reviewed by IESC and USDA              | 5/6/2020         | 5/16/2020        | 10         | 1.00         |              |              |              | xxx   |
| Task 11. Final report revised and submitted            | 5/17/2020        | 5/31/2020        | 14         | 0.50         |              |              |              | xxx   |
| <b>Contract Days for TL, TC, Admin and Enumerators</b> | <b>2/11/2020</b> | <b>5/31/2020</b> | <b>110</b> | <b>35.00</b> | <b>25.00</b> | <b>28.00</b> | <b>24.00</b> |       |

A Gannt Chart in the figure illustrates the timing of the tasks, who is the responsible party, and the current-level of completion. Tasks 2 and 3 have been completed.

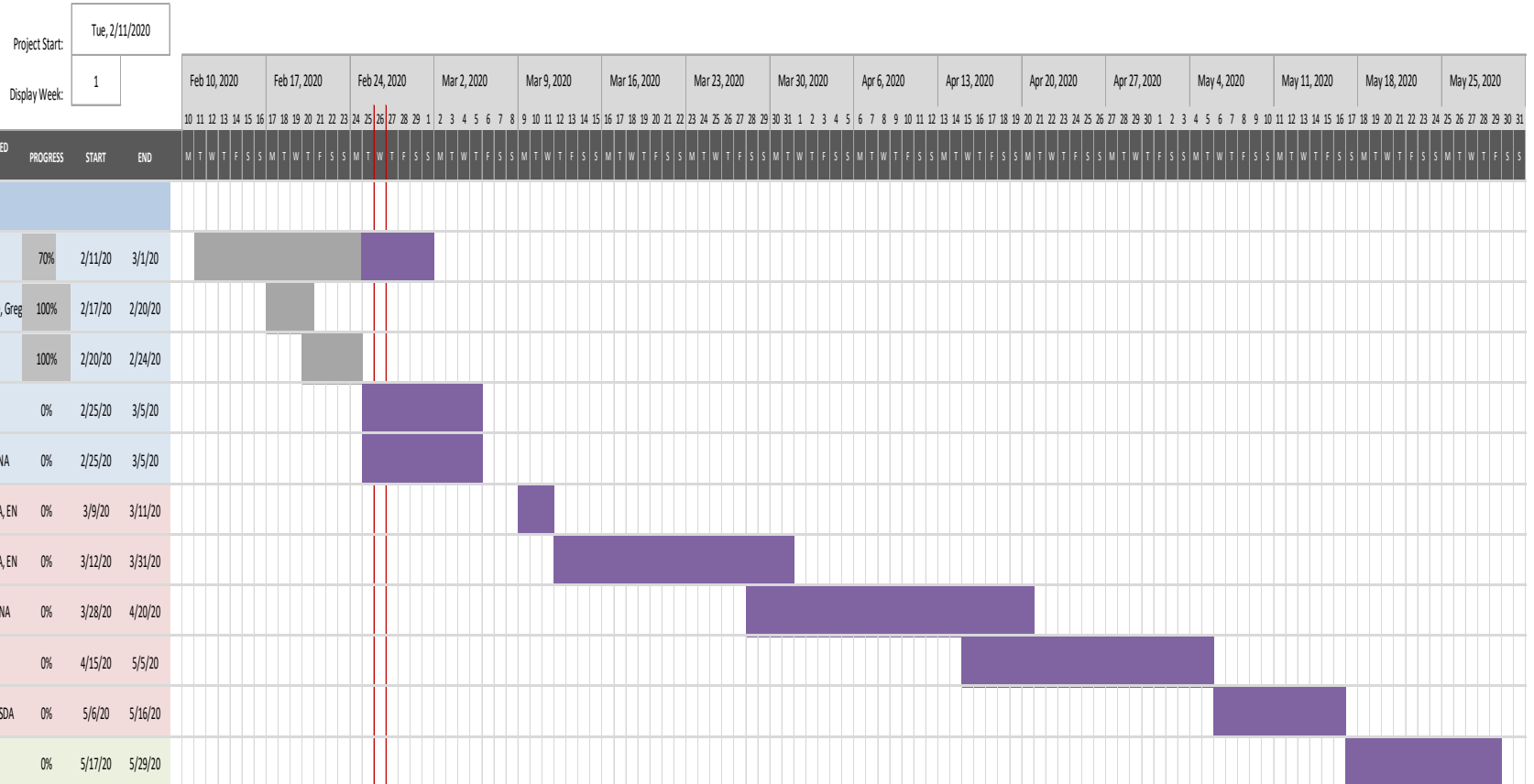
## MOD Mid-Term Evaluation

SIMPLE GANTT CHART by Vertex42.com

<https://www.vertex42.com/ExcelTemplates/simple-gantt-chart.html>

Advanced Marketing Systems

Gregory Sullivan



Note: Grey indicates the level of completion, and purple is remaining time to complete the task.

<https://templates.office.com/en-us/simple-gantt-chart-tm16400962>

### 10.3. Overview of Performance for Each Indicator

The MOD project has 22 performance indicators which they reported to USDA every six months. The Mid-Term Evaluation Team received the Semi-Annual Report #6 and PMP reports for the period of October 1, 2019 to March 30, 2020. MOD is meeting 15 of the 22 indicators. This short synopsis of MOD's performance for each indicator complements the analysis in Chapter 3.

| <b>Indicators</b>                                                                                                                                                                                          | <b>Baseline value</b> | <b>Year 1</b> | <b>Year 2</b> | <b>Mid-term of Year 3</b> | <b>Target at EOP</b> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|---------------|---------------------------|----------------------|
| Indicator #1 (Standard Indicator #1). Number of hectares of land under improved techniques or technologies as a result of USDA assistance                                                                  | 0                     | 0             | 706           | 848                       | 5,506                |
| Indicator #2 (Standard Indicator #17.). Number of individuals benefiting directly from USDA-funded interventions.                                                                                          | 0                     | 199           | 4,110         | 5,747                     | 15,184               |
| Indicator #3 (Standard Indicator #18.). Number of individuals benefiting indirectly from USDA-funded interventions                                                                                         | 0                     | 576           | 12,330        | 17,241                    | 45,553               |
| Indicator #4 (Standard Indicator #3). Number of individuals who have applied improved farm management practices (i.e. governance, administration, or financial management) as a result of USDA assistance. | 0                     | 0             | 1,038         | 1,769                     | 4,320                |
| Indicator #5 (Standard Indicator #2). Number of individuals who have applied new                                                                                                                           | 0                     | 0             | 1,080         | 3,324                     | 11,880               |

|                                                                                                                                                                                      |            |              |              |              |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------|--------------|--------------|------------|
| techniques or technologies as a result of USDA assistance.                                                                                                                           |            |              |              |              |            |
| Indicator #6 (Standard Indicator #16). Number of individuals who have received short-term agricultural sector productivity or food security training as a result of USDA assistance. | 0          | 80           | 2,304        | 2,547        | 5,400      |
| Indicator #7 (Standard Indicator #13). Value of sales by project beneficiaries (USD).                                                                                                | 15,427,539 | \$15,427,539 | \$17,786,887 | \$16,979,949 | 35,168,119 |
| Indicator #8 (Standard Indicator #14). Volume of commodities (MT) sold by project beneficiaries.                                                                                     | 38,525     | 38,525       | 41,543       | 32,107       | 87,820     |
| Indicator #9 (Standard Indicator #4). Number of individuals receiving financial services as a result of USDA assistance.                                                             | 0          | 0            | 1,312        | 1,360        | 2,700      |
| Indicator #10 (Standard Indicator #15). Number of jobs attributed to USDA assistance.                                                                                                | 0          | 0            | 20           | 38           | 200        |
| Indicator #11 (Standard Indicator #5). Number of loans disbursed as a result of USDA assistance                                                                                      | 0          | 0            | 55           | 379          | 2,160      |
| Indicator #12 (Standard Indicator #8). Number of public-private partnerships formed as a result of USDA assistance.                                                                  | 0          | 9            | 11           | 4            | 10         |

|                                                                                                                                                                                                                                                                                                       |   |    |             |             |              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|-------------|-------------|--------------|
| Indicator #13<br>(Standard Indicator #11). Total increase in installed storage capacity (dry or cold storage) as a result of USDA assistance.                                                                                                                                                         | 0 | 0  | 58          | 212         | 54           |
| Indicator #14<br>(Standard Indicator #6). Value of loans provided as a result of USDA assistance (USD).                                                                                                                                                                                               | 0 | 0  | \$256,667   | \$397,954   | \$5,600,000  |
| Indicator #15<br>(Standard Indicator #7). Number of private enterprises, producers organizations, water users associations, women's groups, trade and business associations, and community-based organizations (CBOs) that applied improved techniques and technologies as result of USDA assistance. | 0 | 0  | 25          | 52          | 54           |
| Indicator #16<br>(Standard Indicator #9). Value of new public and private sector investment leveraged as a result of USDA assistance (USD).                                                                                                                                                           | 0 | 0  | \$1,257,827 | \$2,712,808 | \$24,150,000 |
| Indicator #17 (Custom Indicator for Activity#1). Number of public and private extension agent's skills enhanced to provide recommendations on best practices for                                                                                                                                      | 0 | 89 | 586         | 487         | 900          |

|                                                                                                                                                                                      |   |   |     |       |             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|-----|-------|-------------|
| animal health and productivity.                                                                                                                                                      |   |   |     |       |             |
| Indicator #18 (Custom Indicator for Activity #2). Number of dairy input retail operations established                                                                                | 0 | 0 | 19  | 32    | 18          |
| Indicator #19 (Custom Indicator for Activity #3). Value of OPIC/USDA investment fund supported debt and/or equity financing disbursed to enterprises/individuals within target areas | 0 | 0 | 0   | 0     | \$4,000,000 |
| Indicator #20 (Custom Activity for Activity #4). Number of active users of the program-initiated mobile extension SMS messages                                                       | 0 | 0 | 140 | 4,006 | 15,184      |
| Indicator #21 (Custom Activity for Activity #5). Percent of beneficiary farmers earning higher prices than before start of project interventions, due to improved milk quality       | 0 | 0 | 19% | 30%   | 80%         |
| Indicator #22 (Custom Activity for Activity #6). Number of paying members of all island dairy association                                                                            | 0 | 0 | 23  | 21    | 14          |

#### 10.4. A: Comparison MOD and Non-MOD Dairy Producers

**Table 4.1: Field surveys conducted by the evaluation team, March and April 2020**

|                   | Type of Interview | Mullaitivu/<br>Vavuniya | Anuradhapura | Kurunegala | Nuwara<br>Eliya | Total |
|-------------------|-------------------|-------------------------|--------------|------------|-----------------|-------|
| MOD Farmers       | F2F               | 38                      | 67           | 20         |                 | 125   |
| MOD Farmers       | TLP               |                         |              | 30         | 26              | 56    |
| Non-MOD Farmers   | F2F               | 6                       | 5            |            |                 | 11    |
| Non-MOD Farmers   | TLP               |                         |              | 10         | 10              | 20    |
| MOD Model Farmers | F2F               |                         | 2            | 1          |                 | 3     |
| MOD Model Farmers | TLP               |                         |              | 1          |                 | 1     |
| Farmers           | F2F+TLP           | 44                      | 74           | 62         | 36              | 216   |
| Focus Group       | F2F               | 1                       |              |            |                 | 1     |

Note. F2F = face-to-face interviews conducted by evaluation team members. TLP = telephone interviews of farmers because of the COVID-19 restrictions on travel.

**Table 4.2: Primary Sources of Income**

|                          | <b>MOD</b> | <b>%</b> | <b>N-MOD</b> | <b>%</b> |
|--------------------------|------------|----------|--------------|----------|
| <b>Dairy Cattle</b>      | 157        | 84.86%   | 25           | 80.65%   |
| <b>Other Livestock</b>   | 0          | 0.00%    | 0            | 0.00%    |
| <b>Crops Cultivation</b> | 13         | 7.03%    | 4            | 12.90%   |
| <b>Formal Employment</b> | 9          | 4.86%    | 0            | 0.00%    |
| <b>Casual Labor</b>      | 3          | 1.62%    | 0            | 0.00%    |
| <b>Remittances</b>       | 0          | 0.00%    | 0            | 0.00%    |
| <b>Other</b>             | 3          | 1.62%    | 2            | 6.45%    |
| <b>*n = 216</b>          | <b>185</b> |          | <b>31</b>    |          |

**Table 4.3: Food Crop Cultivations**

|                                   | <b>MOD</b>   | <b>%</b> | <b>NMOD</b> | <b>%</b> |
|-----------------------------------|--------------|----------|-------------|----------|
| <b>Not Cultivating Food Crops</b> | 40           | 21.62%   | 6           | 19.35%   |
| <b>Cultivating Any Food Crop</b>  | 145          | 78.38%   | 25          | 80.65%   |
| <b>1 Food Crop</b>                | 76           | 41.08%   | 20          | 64.52%   |
| <b>2-3 Food Crops</b>             | 57           | 30.81%   | 5           | 16.13%   |
| <b>3+ Food Crops</b>              | 12           | 6.49%    | 0           | 0.00%    |
| <b>Maize</b>                      | 28           | 19.31%   | 0           | 0.00%    |
| <b>Millet</b>                     | 8            | 5.52%    | 0           | 0.00%    |
| <b>Rice</b>                       | 94           | 64.83%   | 13          | 52.00%   |
| <b>Beans</b>                      | 24           | 16.55%   | 0           | 0.00%    |
| <b>Vegetables (Non-leafy)</b>     | 56           | 38.62%   | 13          | 52.00%   |
| <b>Vegetables (Leafy)</b>         | 21           | 14.48%   | 1           | 4.00%    |
| <b>Fruits</b>                     | 16           | 11.03%   | 2           | 8.00%    |
| <b>Other</b>                      | 76           | 52.41%   | 20          | 80.00%   |
|                                   | <b>n=145</b> |          | <b>n=25</b> |          |

**Table 4.4: Average Number of Animals in a Herd**

|                                  | <b>MOD</b>   | <b>N-MOD</b> | <b>Total</b> |
|----------------------------------|--------------|--------------|--------------|
| <b>Number of Respondents (n)</b> | 185          | 31           | 216          |
| <b>Milking Cows</b>              | 3.75         | 3.65         | 3.74         |
| <b>Dry Cows</b>                  | 3.39         | 2.03         | 3.20         |
| <b>Heifers</b>                   | 2.58         | 2.32         | 2.54         |
| <b>Calves - Female</b>           | 3.55         | 2.48         | 3.40         |
| <b>Calves - Male</b>             | 2.05         | 1.13         | 1.92         |
| <b>Breeding Bulls</b>            | 0.72         | 0.45         | 0.68         |
| <b>Total Herd</b>                | <b>16.04</b> | <b>12.06</b> | <b>15.47</b> |

**Table 4.5: Average Herd Size**

|                   | <b>MOD</b>     |              | <b>N-MOD</b>  |              |
|-------------------|----------------|--------------|---------------|--------------|
|                   | Total Herd     | Milking Cows | Total Herd    | Milking Cows |
| <b>At Present</b> | 16.04          | 3.77         | 12.06         | 3.77         |
| <b>Last Year</b>  | 18.11          | 5.58         | 14.90         | 5.71         |
|                   | <b>n = 185</b> |              | <b>n = 31</b> |              |

**Table 4.6: Current Milk Production**

|                           | <b>MOD</b> | <b>%</b> | <b>NMOD</b> | <b>%</b> |
|---------------------------|------------|----------|-------------|----------|
| <b>&lt;25 litres/day</b>  | 133        | 71.9%    | 22          | 71.0%    |
| <b>25 - 40 litres/day</b> | 30         | 16.2%    | 4           | 12.9%    |
| <b>40 - 60 litres/day</b> | 13         | 7.0%     | 3           | 9.7%     |
| <b>&gt;=60 litres/day</b> | 9          | 4.9%     | 2           | 6.5%     |
|                           | <b>185</b> |          | <b>31</b>   |          |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.7: Average Milk Production**

|                   | <b>MOD</b> |         | <b>NMOD</b> |         |
|-------------------|------------|---------|-------------|---------|
|                   | Avg Yield  | Per Cow | Avg Yield   | Per Cow |
| <b>At Present</b> | 20.23      | 6.56    | 22.23       | 6.11    |
| <b>Last Year</b>  | 30.40      | 6.84    | 32.26       | 6.39    |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.8: Productivity Per Milking Cow**

|                                | <b>MOD</b>   | <b>%</b> | <b>NMOD</b> | <b>%</b> |
|--------------------------------|--------------|----------|-------------|----------|
| <b>Less than 5 litres/day</b>  | 61           | 33.5%    | 12          | 40.0%    |
| <b>5 - 10 litres/day</b>       | 89           | 48.9%    | 12          | 40.0%    |
| <b>More than 10 litres/day</b> | 32           | 17.6%    | 6           | 20.0%    |
|                                | <b>182**</b> |          | <b>30</b>   |          |

\*\* There were 3 MOD Producers and 1 Non-MOD Producers, who were not having any milking cows at the time of survey. Those were excluded from the count here.

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.9: Type of Cattle Feeds**

|                           | <b>MOD</b>   | <b>%</b> | <b>NMOD</b> | <b>%</b> |
|---------------------------|--------------|----------|-------------|----------|
| <b>Fodder</b>             | 162          | 88.0%    | 22          | 73.3%    |
| <b>Silage</b>             | 31           | 16.8%    | 1           | 3.3%     |
| <b>Concentrated feeds</b> | 127          | 69.0%    | 13          | 43.3%    |
| <b>Minerals</b>           | 159          | 86.4%    | 24          | 80.0%    |
| <b>Roadside grass</b>     | 122          | 66.3%    | 26          | 86.7%    |
| <b>Other</b>              | 29           | 15.8%    | 3           | 10.0%    |
|                           | <b>n=184</b> |          | <b>n=30</b> |          |

**Table 4.10: Sources of Silage**

|                               | MOD         | %      | NMOD       | %       |
|-------------------------------|-------------|--------|------------|---------|
| Grow or Produce               | 28          | 90.32% | 1          | 100.00% |
| Collect from the area         | 7           | 22.58% | 0          | 0.00%   |
| Purchase from neighbor        | 4           | 12.90% | 0          | 0.00%   |
| Purchase from input suppliers | 4           | 12.90% | 0          | 0.00%   |
|                               | <b>n=31</b> |        | <b>n=1</b> |         |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.11: Number of Feed Varieties**

|                         | MOD        | %      | NMOD      | %      |
|-------------------------|------------|--------|-----------|--------|
| 1 type of feed          | 8          | 4.35%  | 5         | 16.67% |
| 2 types of feed         | 15         | 8.15%  | 3         | 10.00% |
| 3 types of feed         | 63         | 34.24% | 10        | 33.33% |
| 4 or more types of feed | 98         | 53.26% | 12        | 40.00% |
|                         | <b>184</b> |        | <b>30</b> |        |

**Table 4.12: Use and Effectiveness of AI**

|                                | MOD    | %      | NMOD   | %      |
|--------------------------------|--------|--------|--------|--------|
| Use of AI Facilities           | 155    | 83.78% | 20     | 64.52% |
| Average AIs Done Last Year (#) | 7.41   | -      | 7.85   | -      |
| AI Success Rate                | 45.16% | -      | 57.14% | -      |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.13: Satisfaction Level of AI Services**

|                                    | MOD         | %      | NMOD        | %      |
|------------------------------------|-------------|--------|-------------|--------|
| Highly Dissatisfied                | 6           | 6.45%  | 0           | 0.00%  |
| Dissatisfied                       | 11          | 11.83% | 1           | 5.26%  |
| Neither Satisfied nor Dissatisfied | 19          | 20.43% | 6           | 31.58% |
| Satisfied                          | 40          | 43.01% | 11          | 57.89% |
| Extremely Satisfied                | 17          | 18.28% | 1           | 5.26%  |
|                                    | <b>n=93</b> |        | <b>n=19</b> |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.14: AI Service Provider**

|                        | MOD          | %      | NMOD        | %      |
|------------------------|--------------|--------|-------------|--------|
| Government Only        | 138          | 90.20% | 17          | 85.00% |
| Private Only           | 8            | 5.23%  | 2           | 10.00% |
| Government and Private | 9            | 5.88%  | 1           | 5.00%  |
|                        | <b>n=158</b> |        | <b>n=20</b> |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.15: Primary Buyer of Milk**

|                                  | <b>MOD</b> | <b>%</b> | <b>NMOD</b> | <b>%</b> |
|----------------------------------|------------|----------|-------------|----------|
| Neighbors                        | 1          | 0.54%    | 1           | 3.23%    |
| Private trader                   | 45         | 24.32%   | 9           | 29.03%   |
| Collection center of a processor | 132        | 71.35%   | 21          | 67.74%   |
| Chilling center of a processor   | 7          | 3.78%    | 0           | 0.00%    |
|                                  | <b>185</b> |          | <b>31</b>   |          |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.16: Time Distance to Buyer Milk Point**

|                   | <b>MOD</b>   | <b>%</b> | <b>NMOD</b> | <b>%</b> |
|-------------------|--------------|----------|-------------|----------|
| Less than 15 mins | 132          | 71.35%   | 22          | 70.97%   |
| 15 - 30 mins      | 27           | 14.59%   | 5           | 16.13%   |
| 30 - 60 mins      | 16           | 8.65%    | 3           | 9.68%    |
| More than 60 mins | 10           | 5.41%    | 1           | 3.23%    |
|                   | <b>n=185</b> |          | <b>n=31</b> |          |

**Table 4.17: Evening Milk Collection**

|                                | <b>MOD</b>   | <b>%</b> | <b>NMOD</b>   | <b>%</b> |
|--------------------------------|--------------|----------|---------------|----------|
| Evening Milking - Yes          | 101          | 54.59%   | 16            | 51.61%   |
| Evening Milking - No           | 84           | 45.41%   | 15            | 48.39%   |
| Willing to Milk in the Evening | 52*          | 61.90%   | 6**           | 40.00%   |
|                                | <b>n*=84</b> |          | <b>n**=15</b> |          |

**Table 4.18: Reasons for Not Milking in the Evening**

|                                                              | <b>MOD</b>  | <b>%</b> | <b>NMOD</b> | <b>%</b> |
|--------------------------------------------------------------|-------------|----------|-------------|----------|
| No processor is collecting milk in the evening               | 32          | 38.10%   | 1           | 6.67%    |
| My management style does not allow me to milk in the evening | 9           | 10.71%   | 1           | 6.67%    |
| I have other work to attend in the evening                   | 4           | 4.76%    | 1           | 6.67%    |
| Milking in the evening will reduce my harvest in the morning | 22          | 26.19%   | 11          | 73.33%   |
| Other                                                        | 17          | 20.24%   | 1           | 6.67%    |
|                                                              | <b>n=84</b> |          | <b>n=15</b> |          |

**Table 4.19: Milk Rejection by the Buyer**

|                     | <b>MOD</b> | <b>%</b> | <b>NMOD</b> | <b>%</b> |
|---------------------|------------|----------|-------------|----------|
| Milk Rejected - No  | 162        | 87.57%   | 29          | 93.55%   |
| Milk Rejected - Yes | 23         | 12.43%   | 2           | 6.45%    |
|                     | <b>185</b> |          | <b>31</b>   |          |

**Table 4.20 Changes in Milk Prices Received Between Current & Last Year– MOD & NMOD**

|                                    | <b>MOD</b> | <b>NMOD</b> |
|------------------------------------|------------|-------------|
| Avg Price per litre – Current Year | 71.65      | 69.74       |
| Avg Price per litre – Last Year    | 65.87      | 65.55       |
| Min Price – Current Year           | 60.00      | 60.00       |
| Min Price – Last Year              | 50.00      | 58.00       |
| Max Price – Current Year           | 89.00      | 78.00       |
| Max Price – Last Year              | 78.00      | 75.00       |

**Table 4.21: Change in Current Milk Price in Comparison to Last Year for MOD producers**

|                              | <b>number</b> | <b>%</b>       |
|------------------------------|---------------|----------------|
| Price Change - Negative      | 5             | 2.76%          |
| Price Change - 0%            | 26            | 14.36%         |
| Price Change - 0% - 5%       | 27            | 14.92%         |
| Price Change - 5% - 10%      | 51            | 28.18%         |
| Price Change - More than 10% | 71            | 39.78%         |
|                              | <b>181</b>    | <b>100.00%</b> |

**Table 4.22: Practices Followed to Have Higher Price for Milk**

|                                                      | <b>MOD</b> | <b>%</b> | <b>NMOD</b> | <b>%</b> |
|------------------------------------------------------|------------|----------|-------------|----------|
| No. of Respondents*                                  | 148        | 29.25%   | 25          | 52.38%   |
| 1 Practice                                           | 95         | 64.19%   | 22          | 88.00%   |
| 2 Practices                                          | 36         | 24.32%   | 2           | 8.00%    |
| 3 or More Practices                                  | 17         | 11.49%   | 1           | 4.00%    |
| I began to provide high quality fodder for my cattle | 60         | 40.54%   | 4           | 16.00%   |
| I began to provide silage for my cattle              | 18         | 12.16%   | 1           | 4.00%    |
| I began to provide concentrated feed for my cattle   | 51         | 34.46%   | 3           | 12.00%   |
| Nothing                                              | 46         | 31.08%   | 13          | 52.00%   |
| Don't Know                                           | 15         | 10.14%   | 5           | 20.00%   |
| Other                                                | 28         | 18.92%   | 3           | 12.00%   |

\* Those who reported to receive higher price for milk comparison to last year

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

## Comparison between Male and Female Dairy Producers

**Table 4.23: Geographic Distribution of Sample (MOD and N-MOD)**

|                   |        | Mullaitivu/<br>Vavuniya | Anuradhapu<br>ra | Kurunegala | Nuwara<br>Eliya | Total      |
|-------------------|--------|-------------------------|------------------|------------|-----------------|------------|
| MOD Producers     | Male   | 27                      | 50               | 43         | 22              | 142        |
| MOD Farmers       | Female | 11                      | 19               | 9          | 4               | 43         |
| Non-MOD Producers | Male   | 5                       | 4                | 9          | 10              | 28         |
| Non-MOD Producers | Female | 1                       | 1                | 1          | -               | 3          |
|                   |        | <b>44</b>               | <b>74</b>        | <b>62</b>  | <b>36</b>       | <b>216</b> |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.24: Gender Wise Analysis of Key Indicators (MOD Producers)**

|                                     | Female | %      | Male  | %      |
|-------------------------------------|--------|--------|-------|--------|
| Sample Size                         | 43     | 23.24% | 142   | 76.76% |
| Average Herd Size - Present         | 11.51  | -      | 17.42 | -      |
| Average Herd Size - Last Year       | 12.51  | -      | 19.80 | -      |
| Average Milk Production - Present   | 17.05  | -      | 21.94 | -      |
| Average Milk Production - Last Year | 25.19  | -      | 32.60 | -      |
| Yield Per Cow - Present             | 6.37   | -      | 6.62  | -      |
| Yield Per Cow - Last Year           | 6.88   | -      | 6.85  | -      |
| Use Silage as a Cattle Feed         | 12     | 28.57% | 19    | 13.29% |
| Did AI                              | 36     | 85.71% | 119   | 83.22% |
| Savings                             | 22     | 52.38% | 68    | 47.55% |
| Evening Milking                     | 24     | 57.14% | 77    | 53.85% |
| Willing to Do Evening Milking       | 14     | 73.68% | 38    | 38.78% |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.25: Education Level of MOD Producers**

|                                    | Female    | %      | Male       | %      |
|------------------------------------|-----------|--------|------------|--------|
| None                               | 1         | 2.33%  | 1          | 0.70%  |
| Some Primary                       | 2         | 4.65%  | 8          | 5.63%  |
| Primary completed (passed grade 5) | 4         | 9.30%  | 17         | 11.97% |
| Some secondary                     | 15        | 34.88% | 40         | 28.17% |
| Passed O/L                         | 16        | 37.21% | 55         | 38.73% |
| Passed A/L                         | 5         | 11.63% | 18         | 12.68% |
| Graduate or higher                 | 0         | 0.00%  | 3          | 2.11%  |
| <b>*n = 185</b>                    | <b>43</b> |        | <b>142</b> |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

## Investments in dairy – MOD and N-MOD

**Table 4.26: New Investments in Dairy Enterprise in last 12 months**

|     | MOD        | %      | NMOD      | %      |
|-----|------------|--------|-----------|--------|
| Yes | 83         | 44.86% | 8         | 25.81% |
| No  | 102        | 55.14% | 23        | 74.19% |
|     | <b>185</b> |        | <b>31</b> |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.27: Value of New Investments on Dairy Enterprise**

|                       | MOD         | %      | NMOD       | %      |
|-----------------------|-------------|--------|------------|--------|
| Less the Rs. 50,000   | 15          | 18.29% | 1          | 12.50% |
| Rs.50,000 - 100,000   | 15          | 18.29% | 1          | 12.50% |
| Rs.100,000 - 200,000  | 24          | 29.27% | 3          | 37.50% |
| Rs. 200,000 - 500,000 | 19          | 23.17% | 2          | 25.00% |
| Above Rs. 500,000     | 9           | 10.98% | 1          | 12.50% |
|                       | <b>n=82</b> |        | <b>n=8</b> |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

## Adopt New Practices

**Table 4.28: Adopt New Dairy Practices in the last 12 months – MOD vs N-MOD**

|                                          | MOD          | %      | NMOD       | %       |
|------------------------------------------|--------------|--------|------------|---------|
| Adopted New Practices - Yes              | 108          | 58.38% | 4          | 12.90%  |
| Adopted New Practices - No               | 77           | 41.62% | 27         | 87.10%  |
|                                          | <b>n=108</b> |        | <b>n=4</b> |         |
| Adopted 1 New Practice                   | 15           | 13.89% | 0          | 0.00%   |
| Adopted 2 - 3 New Practices              | 50           | 46.30% | 1          | 25.00%  |
| Adopted 4 or More New Practices          | 43           | 39.81% | 3          | 75.00%  |
| Feeding cattle with more nutritious food | 98           | 90.74% | 4          | 100.00% |
| Adopt new techniques in milking          | 37           | 34.26% | 2          | 50.00%  |
| Increased hygiene of dairy operations    | 65           | 60.19% | 4          | 100.00% |
| Housing related practices                | 70           | 64.81% | 3          | 75.00%  |
| Artificial Insemination                  | 46           | 42.59% | 3          | 75.00%  |
| Market Price Information                 | 26           | 24.07% | 2          | 50.00%  |
| Use of ICT for knowledge sharing         | 13           | 12.04% | 2          | 50.00%  |
| Other                                    | 5            | 4.63%  | 0          | 0.00%   |
|                                          | <b>n=108</b> |        | <b>n=4</b> |         |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

## Effectiveness of MOD interventions (MOD producers only)

**Table 4.29: Effective Interventions for MOD Producers Only**

|                                            | #                   | %       |
|--------------------------------------------|---------------------|---------|
|                                            | <i>n=135</i>        |         |
| Trainings                                  | 135                 | 100.00% |
| On farm discussions                        | 86                  | 63.70%  |
| Mentoring sessions                         | 71                  | 52.59%  |
| Preparations of action plans               | 37                  | 27.41%  |
| Preparations of business plans             | 36                  | 26.67%  |
| Other                                      | 4                   | 2.96%   |
|                                            |                     |         |
| Improvements were significant - Yes        | 128                 | 94.81%  |
| Improvements were significant - No         | 5                   | 3.70%   |
| Improvements were significant - Don't Know | 2                   | 1.48%   |
|                                            | <b><i>n=135</i></b> |         |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.30: Having Adequate Knowledge to Sustain the Improvements – MOD only**

|            | #                   | %      |
|------------|---------------------|--------|
| Yes        | 104                 | 77.04% |
| No         | 31                  | 22.96% |
| Don't Know | 0                   | 0.00%  |
|            | <b><i>n=135</i></b> |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

## TABLE B. Comparison between Productivity Categories

MOD Producers were divided into 3 groups based on the productivity of their milking cows at the time of the survey. To arrive at that figure, their daily milk production was divided by the number of milking cows. Based on that they were divided into 3 groups as follows:

- 1 - Less than 5 litres per day per milking cow (<5)
- 2 – More than or equal to 5 litres and less than 10 litres per day per cow ( $\geq 5$  - <10)
- 3 – More than or equal to 10 litres per day per cow ( $\geq 10$ )

**Table 4.31: Geographic Distribution of MOD Producers Only**

| Productivity Categories<br>[Litres per cow, per day] | Mullaitivu<br>/Vavuniya | Anuradhapu<br>ra | Kurunegala | Nuwara<br>Eliya | Total      |
|------------------------------------------------------|-------------------------|------------------|------------|-----------------|------------|
| <5 litres                                            | 20                      | 26               | 14         | 1               | 61         |
| $\geq 5$ - <10 litres                                | 12                      | 35               | 31         | 11              | 89         |
| $\geq 10$ litres                                     | 4                       | 8                | 6          | 14              | 32         |
|                                                      | <b>36</b>               | <b>69</b>        | <b>51</b>  | <b>26</b>       | <b>182</b> |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.32: Productivity Vs Education Level of MOD Producers**

|                                    | <5<br>litres | %      | 5 - 10<br>litres | %      | $\geq 10$<br>litres | %     |
|------------------------------------|--------------|--------|------------------|--------|---------------------|-------|
| None                               | 0            | 0.00%  | 1                | 0.55%  | 1                   | 0.55% |
| Some Primary                       | 3            | 1.65%  | 6                | 3.30%  | 1                   | 0.55% |
| Primary completed (passed grade 5) | 9            | 4.95%  | 8                | 4.40%  | 4                   | 2.20% |
| Some secondary                     | 23           | 12.64% | 24               | 13.19% | 8                   | 4.40% |
| Passed O/L                         | 21           | 11.54% | 37               | 20.33% | 12                  | 6.59% |
| Passed A/L                         | 5            | 2.75%  | 13               | 7.14%  | 4                   | 2.20% |
| Graduate or higher                 | 0            | 0.00%  | 0                | 0.00%  | 2                   | 1.10% |
| <b>*n = 182</b>                    | <b>61</b>    |        | <b>89</b>        |        | <b>32</b>           |       |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.33: Productivity Vs Age of MOD Producers**

|                 | <5<br>litres | %      | 5 - 10<br>litres | %      | $\geq 10$<br>litres | %     |
|-----------------|--------------|--------|------------------|--------|---------------------|-------|
| <30 Years       | 3            | 1.65%  | 0                | 0.00%  | 3                   | 1.65% |
| 30 - 40 Years   | 8            | 4.40%  | 23               | 12.64% | 7                   | 3.85% |
| 40 - 50 Years   | 22           | 12.09% | 27               | 14.84% | 10                  | 5.49% |
| 50 - 60 Years   | 22           | 12.09% | 25               | 13.74% | 6                   | 3.30% |
| $\geq 60$ Years | 6            | 3.30%  | 14               | 7.69%  | 6                   | 3.30% |
| <b>*n = 182</b> | <b>61</b>    |        | <b>89</b>        |        | <b>32</b>           |       |

**Table 4.34: Practices Followed during last year to lead to higher price for milk (Qtn.2.4.7)**

|                                                      | <5<br>litres | %      | 5 - 10<br>litres | %      | >=10<br>litres | %      |
|------------------------------------------------------|--------------|--------|------------------|--------|----------------|--------|
| No. of Respondents                                   | 43           | 29.25% | 77               | 52.38% | 27             | 18.37% |
| 1 Practice                                           | 29           | 19.73% | 47               | 31.97% | 19             | 12.93% |
| 2 Practices                                          | 9            | 6.12%  | 20               | 13.61% | 6              | 4.08%  |
| 3 or More Practices                                  | 5            | 3.40%  | 10               | 6.80%  | 2              | 1.36%  |
|                                                      |              |        |                  |        |                |        |
| I began to provide high quality fodder for my cattle | 14           | 9.52%  | 32               | 21.77% | 13             | 8.84%  |
| I began to provide silage for my cattle              | 5            | 3.40%  | 10               | 6.80%  | 3              | 2.04%  |
| I began to provide concentrated feed for my cattle   | 14           | 9.52%  | 29               | 19.73% | 7              | 4.76%  |
| Nothing                                              | 15           | 10.20% | 20               | 13.61% | 11             | 7.48%  |
| Don't Know                                           | 2            | 1.36%  | 11               | 7.48%  | 2              | 1.36%  |
| Other                                                | 12           | 8.16%  | 15               | 10.20% | 1              | 0.68%  |
| <b>*n = 147</b>                                      |              |        |                  |        |                |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.35: Received Training from LDI (within last year) for MOD producers**

|     | <5<br>litres | %      | 5 - 10<br>litres | %      | >=10<br>litres | %      |
|-----|--------------|--------|------------------|--------|----------------|--------|
| Yes | 19           | 31.15% | 24               | 26.97% | 11             | 34.38% |
| No  | 42           | 68.85% | 65               | 73.03% | 21             | 65.63% |
|     | <b>61</b>    |        | <b>89</b>        |        | <b>32</b>      |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.36: Preferred Person to Contact Regarding Health of Cattle for MOD producers**

|                                                 | <5<br>litres | %      | 5 - 10<br>litres | %      | >=10<br>litres | %      |
|-------------------------------------------------|--------------|--------|------------------|--------|----------------|--------|
| Private vet doctor                              | 2            | 3.28%  | 0                | 0.00%  | 0              | 0.00%  |
| Government vet doctor                           | 55           | 90.16% | 80               | 89.89% | 29             | 90.63% |
| Dairy extension officer attached to a processor | 1            | 1.64%  | 1                | 1.12%  | 0              | 0.00%  |
| Livestock Development Officer (LDI)             | 0            | 0.00%  | 1                | 1.12%  | 2              | 6.25%  |
| Local Vet Clinic                                | 1            | 1.64%  | 5                | 5.62%  | 0              | 0.00%  |
| Retail input dealer                             | 0            | 0.00%  | 0                | 0.00%  | 0              | 0.00%  |
| Neighbor                                        | 1            | 1.64%  | 1                | 1.12%  | 0              | 0.00%  |
| Other                                           | 1            | 1.64%  | 1                | 1.12%  | 1              | 3.13%  |
| <b>*n = 182</b>                                 | <b>61</b>    |        | <b>89</b>        |        | <b>32</b>      |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.37: Training Sources of MOD Producers**

|                           | <5<br>litres | %      | 5 - 10<br>litres | %      | >=10<br>litres | %       |
|---------------------------|--------------|--------|------------------|--------|----------------|---------|
| No. of Respondents        | 61           | 33.52% | 89               | 48.90% | 32             | 17.58%  |
| Not Received Any Training | 0            | 0.00%  | 2                | 1.36%  | 0              | 0.00%   |
| Received Training         | 61           | 41.50% | 87               | 59.18% | 32             | 21.77%  |
|                           |              |        |                  |        |                |         |
| MOD Project               | 60           | 98.36% | 86               | 96.63% | 32             | 100.00% |
| Milk Processor            | 11           | 18.03% | 25               | 28.09% | 5              | 15.63%  |
| DAPH                      | 20           | 32.79% | 42               | 47.19% | 16             | 50.00%  |
| NGOs                      | 4            | 6.56%  | 9                | 10.11% | 4              | 12.50%  |
| Other                     | 3            | 4.92%  | 2                | 2.25%  | 0              | 0.00%   |
| <b>*n = 182</b>           |              |        |                  |        |                |         |

**Table 4.38: Frequencies of Receiving Trainings for MOD Producers**

|                                               | <5<br>litres | %      | 5 - 10<br>litres | %      | >=10<br>litres | %      |
|-----------------------------------------------|--------------|--------|------------------|--------|----------------|--------|
| No. of Respondents                            | 61           | 33.52% | 89               | 48.90% | 32             | 17.58% |
| Not Attended Any Training                     | 0            | 0.00%  | 2                | 2.25%  | 0              | 0.00%  |
| Attended Trainings - From only 1 source       | 34           | 55.74% | 34               | 38.20% | 10             | 31.25% |
| Attended Trainings - From 2 sources           | 18           | 29.51% | 30               | 33.71% | 19             | 59.38% |
| Attended Trainings - From more than 3 sources | 9            | 14.75% | 23               | 25.84% | 3              | 9.38%  |
|                                               |              |        |                  |        |                |        |
| <i>Attendance at training events:</i>         | <i>n=60</i>  |        | <i>n=86</i>      |        | <i>n=32</i>    |        |
| Attended 1 training event                     | 16           | 26.67% | 23               | 26.74% | 6              | 18.75% |
| Attended 2 - 4 training events                | 40           | 66.67% | 54               | 62.79% | 22             | 68.75% |
| Attended 5 - 8 training events                | 2            | 3.33%  | 6                | 6.98%  | 3              | 9.38%  |
| Attended more than 8 training events          | 2            | 3.33%  | 3                | 3.49%  | 1              | 3.13%  |

**Table 4.39: Training Effectiveness for MOD Producers**

|                                     | <5<br>litres | %      | 5 - 10<br>litres | %      | >=10<br>litres | %      |
|-------------------------------------|--------------|--------|------------------|--------|----------------|--------|
| Pre & Post Evaluations - Yes        | 50           | 34.01% | 72               | 48.98% | 25             | 17.01% |
| Pre & Post Evaluations - No         | 4            | 2.72%  | 8                | 5.44%  | 5              | 3.40%  |
| Pre & Post Evaluations - Don't Know | 6            | 4.08%  | 6                | 4.08%  | 2              | 1.36%  |
|                                     | <b>60</b>    |        | <b>86</b>        |        | <b>32</b>      |        |
| <b>Training Effectiveness:</b>      | <i>n=60</i>  |        | <i>n=86</i>      |        | <i>n=32</i>    |        |
| Very Poor                           | 3            | 5.00%  | 1                | 1.16%  | 1              | 3.13%  |
| Poor                                | 0            | 0.00%  | 0                | 0.00%  | 0              | 0.00%  |
| Moderate                            | 5            | 8.33%  | 3                | 3.49%  | 2              | 6.25%  |
| Good                                | 46           | 76.67% | 67               | 77.91% | 18             | 56.25% |
| Very Good                           | 6            | 10.00% | 15               | 17.44% | 11             | 34.38% |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.40: New Investments on Dairy Enterprise in last 12 months for MOD producers**

|     | <5<br>litres | %      | 5 - 10<br>litres | %      | >=10<br>litres | %      |
|-----|--------------|--------|------------------|--------|----------------|--------|
| Yes | 25           | 40.98% | 43               | 48.31% | 15             | 46.88% |
| No  | 36           | 59.02% | 46               | 51.69% | 17             | 53.13% |
|     | <b>61</b>    |        | <b>89</b>        |        | <b>32</b>      |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.41: Value of New Investments on Dairy Enterprise for MOD producers**

|                       | <5<br>litres | %      | 5 - 10<br>litres | %      | >=10<br>litres | %      |
|-----------------------|--------------|--------|------------------|--------|----------------|--------|
| Less the Rs. 50,000   | 5            | 20.00% | 8                | 19.05% | 2              | 13.33% |
| Rs.50,000 - 100,000   | 6            | 24.00% | 5                | 11.90% | 4              | 26.67% |
| Rs.100,000 - 200,000  | 5            | 20.00% | 14               | 33.33% | 5              | 33.33% |
| Rs. 200,000 - 500,000 | 8            | 32.00% | 8                | 19.05% | 3              | 20.00% |
| Above Rs. 500,000     | 1            | 4.00%  | 7                | 16.67% | 1              | 6.67%  |
|                       | <b>25</b>    |        | <b>42</b>        |        | <b>15</b>      |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.42: Adopt New Dairy Practices for MOD producers**

|                                          | <5<br>litres | %      | 5 - 10<br>litres | %       | >=10<br>litres | %      |
|------------------------------------------|--------------|--------|------------------|---------|----------------|--------|
| Adopted New Practices - Yes              | 31           | 50.82% | 51               | 57.30%  | 25             | 78.13% |
| Adopted New Practices - No               | 30           | 49.18% | 38               | 42.70%  | 7              | 21.88% |
| Adopted 1 New Practice                   | 4            | 12.90% | 6                | 11.76%  | 5              | 20.00% |
| Adopted 2 - 3 New Practices              | 16           | 51.61% | 20               | 39.22%  | 14             | 56.00% |
| Adopted 4 or More New Practices          | 11           | 35.48% | 25               | 49.02%  | 6              | 24.00% |
| Feeding cattle with more nutritious food | 27           | 87.10% | 47               | 92.16%  | 23             | 92.00% |
| Adopt new techniques in milking          | 14           | 45.16% | 0                | 0.00%   | 5              | 20.00% |
| Increased hygiene of dairy operations    | 20           | 64.52% | 33               | 64.71%  | 11             | 44.00% |
| Housing Related Practices                | 13           | 41.94% | 73               | 143.14% | 18             | 72.00% |
| Artificial Insemination                  | 16           | 51.61% | 0                | 0.00%   | 7              | 28.00% |
| Market Price Information                 | 6            | 19.35% | 21               | 41.18%  | 2              | 8.00%  |
| Use of ICT for knowledge Sharing         | 3            | 9.68%  | 0                | 0.00%   | 2              | 8.00%  |
| Other                                    | 2            | 6.45%  | 3                | 5.88%   | 1              | 4.00%  |
|                                          | <b>n=31</b>  |        | <b>n=51</b>      |         | <b>n=25</b>    |        |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.43: Improvements in Dairy Business (Qtn. 3.I.)**

|                                                      | <5<br>litres | %      | 5 - 10<br>litres | %      | >=10<br>litres | %      |
|------------------------------------------------------|--------------|--------|------------------|--------|----------------|--------|
| Business Improved during Last Year - Yes             | 46           | 75.41% | 68               | 76.40% | 27             | 84.38% |
| Business Improved during Last Year - No              | 15           | 24.59% | 21               | 23.60% | 5              | 15.63% |
|                                                      |              |        |                  |        |                |        |
| <i>If not improved, main reason for that: (n=16)</i> |              |        |                  |        |                |        |
| Lack of feed                                         | 0            |        | 5                |        | 4              |        |
| Lack of water (drought)                              | 0            |        | 3                |        | 0              |        |
| Persistent diseases                                  | 2            |        | 1                |        | 0              |        |
| Poor market prices                                   | 0            |        | 0                |        | 0              |        |
| Other                                                | 0            |        | 1                |        | 0              |        |
|                                                      |              |        |                  |        |                |        |
| <i>If improved:</i>                                  |              |        |                  |        |                |        |
| Is that due to MOD interventions - Yes               | 42           | 91.30% | 67               | 98.53% | 26             | 96.30% |
| Is that due to MOD interventions - No                | 1            | 2.17%  | 1                | 1.47%  | 1              | 3.70%  |
| Is that due to MOD interventions - Don't Know        | 3            | 6.52%  | 0                | 0.00%  | 0              | 0.00%  |
|                                                      | <b>n=46</b>  |        | <b>n=68</b>      |        | <b>n=27</b>    |        |

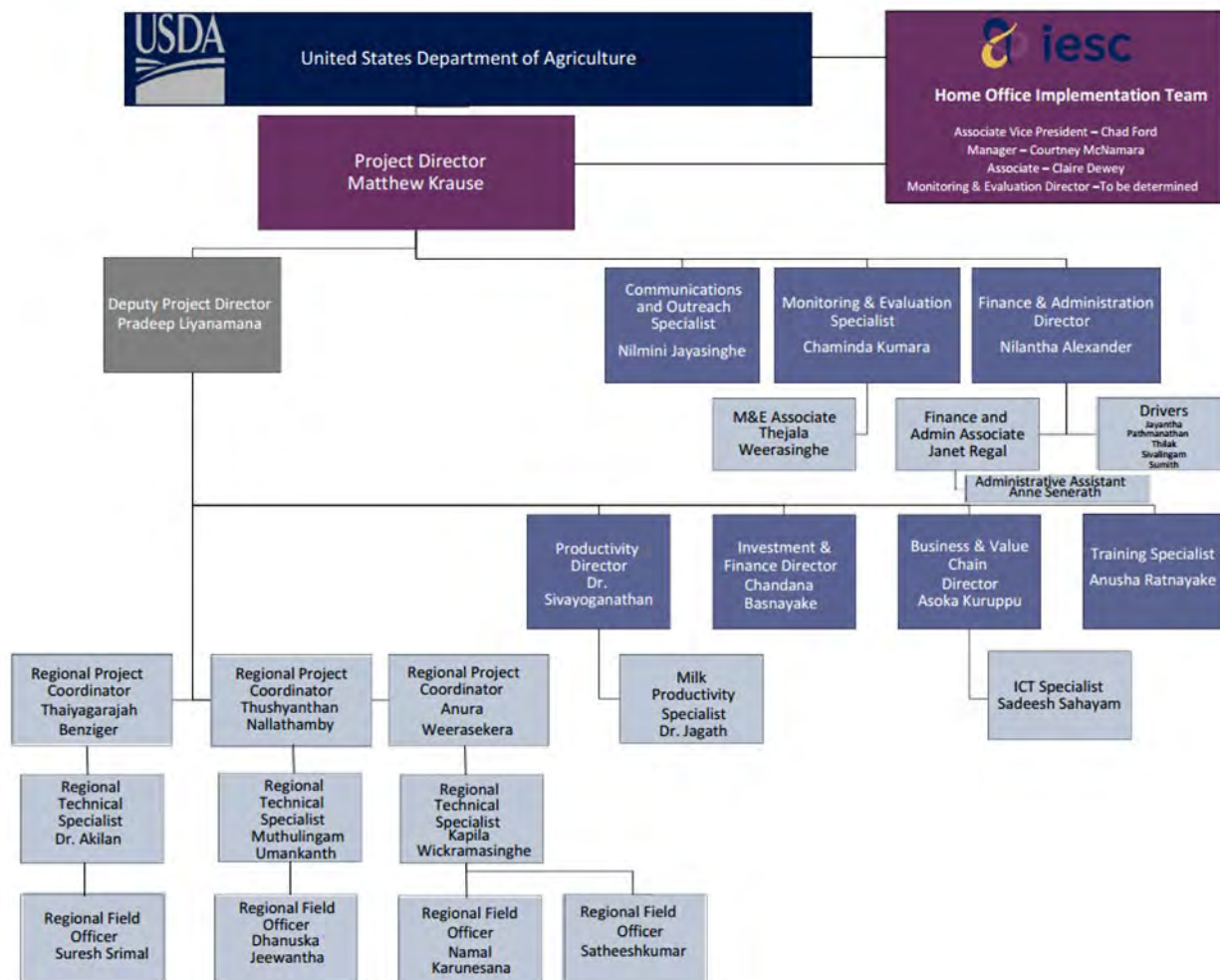
Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

**Table 4.44: Types of improvements since association with MOD Project**

|                                                | <5<br>litres | %      | 5 - 10<br>litres | %      | >=10<br>litres | %       |
|------------------------------------------------|--------------|--------|------------------|--------|----------------|---------|
|                                                | n=42         |        | n=67             |        | n=26           |         |
| Milk production                                | 40           | 95.24% | 62               | 92.54% | 26             | 100.00% |
| Shorter cycle for cows to rebreed              | 19           | 45.24% | 33               | 49.25% | 9              | 34.62%  |
| Lower death rate                               | 24           | 57.14% | 30               | 44.78% | 8              | 30.77%  |
| Quality of milk increased                      | 37           | 88.10% | 60               | 89.55% | 23             | 88.46%  |
| Produce more milk from the same number of cows | 26           | 61.90% | 48               | 71.64% | 12             | 46.15%  |
| Increase revenues from milk sales              | 23           | 54.76% | 37               | 55.22% | 10             | 38.46%  |
| Other                                          | 0            | 0.00%  | 0                | 0.00%  | 0              | 0.00%   |
|                                                |              |        |                  |        |                |         |
| At least 2 improvements                        | 7            | 16.67% | 15               | 22.39% | 13             | 50.00%  |
| 3 - 4 Improvements                             | 18           | 42.86% | 24               | 35.82% | 5              | 19.23%  |
| More than 4 Improvements                       | 17           | 40.48% | 28               | 41.79% | 8              | 30.77%  |
|                                                | <b>n=42</b>  |        | <b>n=67</b>      |        | <b>n=26</b>    |         |

Source: Field Survey of Mid-Term Evaluation, MOD Project, Mar-Apr 2020

## 10.5. Organization Chart for MOD



## 10.6. Photographs from Meetings with Farmers and Focus Groups

**Picture 10.6.1.** A Focus Group Discussion in the Northern Province



**Picture 10.6.2.** Milk cans being weighed before collection at farm in the North Central Province



**Picture 10.6.3.** Milk cans loaded on small truck for transport to collection center at farm in the North Central Province



**Picture 10.6.4.** Dairy barn in the Northern Province



**Picture 10.6.5.** A biogas unit at a dairy barn



**Picture 10.6.6.** Field of CO3 in the Northern Province



**Picture 10.6.7.** Prepared field for forage production in the Northern Province



**Picture 10.6.8.** Azolla tank located near producer's dairy barn



**Figure 10.6.9.** Farm land prepared for planting fodder grass and maize in the Northern Province



**Picture 10.6.10.** Silage packaging machinery in the Northern Province



**Picture 10.6.11.** Dairy barn, Sahiwal crosses and chaff cutter at a farm in the North Central Province



**Picture 10.6.12.** Calf separated from mother after birth and bottle feed at a farm in the North Western Province



**Picture 10.6.13.** Cows in dairy barn with milk machine at a farm in the North Western Province



**Picture 10.6.14.** Barrels use for storing silage



**Picture 10.6.15.** Milk collection center in the Northern Province funded by USAID's SOLID Project



**Picture 10.6.16.** Dairy shed at a farm in the Northern Province



Note: The Ayrshire cow (second from the left and laying down is producing 22 l/d.

Note: The Jersey cow on the right is producing 18 – 20 l/d and is the milk is receiving Rs. 72/l

**10.7. Surveys (see attached compressed file)**

**10.7.1. Quantitative Survey of Dairy Producers (English, Tamil and Sinhalese) See compressed attachment)**

**10.7.2. Qualitative Survey of Key Informant Interviews (see compressed attachment)**

**10.8. Transcripts of KIIs.**  
**(see attached file)**

**10.9. Data set of the field survey of MOD and N-MOD Producers**  
**(see database in attached Excel file)**

**10.10. Synopsis of the Mid-Term Evaluation of MOD – Short Report  
(see attached file)**

## 10.11. IESC RESPONSE TO FINDINGS

IESC is pleased that the MOD project midterm evaluators believe IESC is implementing MOD in line with their agreement; MOD's interventions are implemented effectively, efficiently and are technically sound; MOD's interventions are appropriate to the Sri Lanka context; MOD interventions are achieving project goals and objectives; and that IESC and its subs are managing the project and delivering technical content professionally, ethically and effectively.

As highlighted in this report and in our semiannual reports, the MOD project has faced significant external challenges (political, economic and social-security) as well as dairy industry impediments (adverse weather, large farm failures, and disease outbreaks). These negative external and industry forces resulted in investors' and entrepreneurs' reluctance towards dairy specific investments and reduced the willingness of banks to provide loans. The industry specific issues reduced milk supply which resulted in dairy processors focusing on procurement of milk while DAPH focused on animal health leaving a gap in development of dairy producers and needed attention to on farm productivity.

IESC and MOD are still without a signed MOU between USDA and GOSL which has hampered and delayed some of our interventions and activities that required close coordination with the DAPH.

IESC agrees that the MOD project is on track with 16 of its 22 indicators. The previously mentioned external and industry specific challenges have negatively and significantly impacted five of the six indicators. The other custom indicator specific to the MOD investment fund is behind schedule due to delays in getting additional commodity and thus funds from USDA. It is still possible that this indicator will be achieved. For five of the indicators, we kindly reiterate the challenges, mitigation measure taken and anticipated target modifications.

- **Number of hectares of land under improved techniques or technologies as a result of USDA assistance**
  - a. **Challenges:** Army worm (2018), FMD (2019/2020), and drought and floods had negative impact on supply of and demand for fodder to feed animals. There was limited demand among small farmers and weakened demand from financially burdened large farms which meant farmers feed roadside grass instead of fodder. Since commercial fodder cultivation is a nascent industry, there is reluctance to grow as demand is unknown, unclear and unassured. Fodder crops are not officially recognized by the GOSL thus land and other input are limited.
  - b. **Mitigation measure:** MOD facilitated supplier/buyer relationships to ensure supply met demand as we don't want to push commercial fodder cultivation unless ready buyer is available. We encouraged and developed regional silage enterprises to add value and

shelf life of green fodder. We developed action plans for high producers to encourage cultivation and worked with international consultant to analysis the land issues.

- c. **Revised target at end of project:** Reduce end of project to 2419 hectares from 5506 hectares (56% reduction).

- **Volume of commodities (MT) sold by project beneficiaries**

- a. **Challenges:** Army worm (2018), FMD (2019/2020), and drought and floods had negative impact on milk production due to limitation on feed and poor animal health. During stressful times, small and medium scale farmers are risk adverse to change behavior around feeding practices while large farms struggled financially. There is a limited number of MOD sized farmers which negatively impacts our baseline assumptions. Due to milk shortages, dairy processors are focused on milk procurement and less engaged with MOD's approach to develop dairy suppliers.
- b. **Mitigation measure:** We continue to target medium sized farms (>25L) and have concentrated focus and support to a limited number of large farms. We have engaged targeted farmers in numerous ways including group training at DFs, FGD, and one on one farm visits using KPIs and action plans as tools. We continue to impress upon MOD staff of the goal to double milk production for every farmer and thus keep them focused on activities and interventions that drive milk production. We have investment time and effort into developing feed systems (commercial fodder and silage while also promoting cultivation at dairy farms) and partnering with banks and SAPP to facilitate key investment financing.
- c. **Revised target at end of project:** Reduce end of project production target to 70,000 MT from 87,820 MT (20% reduction).

- **Number of loans disbursed as a result of USDA assistance and Value of loans provided as a result of USDA assistance (USD)**

- a. **Challenges:** The economic and political risks have made banks more risk adverse and thus increased reluctance to loan. Furthermore, banks have experienced high number of non-performing loans especially for the large farms that are financially struggling. Dairy specific loans schemes are not available as anticipated. And farmers are indebted, and previous loans were unproductive. For the loans that are disbursed the average value is much lower than anticipated (LKR 500K versus 165K).
- b. **Mitigation measure:** MOD partnered with 4 banks, SAPP, and other schemes (IDB) to identify low interest loans. We provided farmers training targeted to utilize loans for productive purposes and upgraded farmers business knowledge.
- c. **Revised target at end of project:** Reduce end of project number of loans to 1430 from 2160 (34% reduction). Reduce end of project value of loans to \$1.6 million from \$5.6 million (71% reduction).

- **Value of new public and private sector investment leveraged as a result of USDA assistance (USD)**
  - a. **Challenges:** Economic, security and political risks were elevated including which caused significant Sri Lankan Rupee depreciation and thus raise the cost of capital. Also, failures of the imported cow program with high NPLs and delays in the MOD investment fund reduced investment opportunities.
  - b. **Mitigation measure:** MOD partnered with 4 banks, SAPP, and other schemes (IDB) to identify low interest loans. MOD provided technical support to potential key large investors (Watawala, Ambewela and Richlife). MOD is trying to help some mega farms and fast track MOD's investment fund. We continuously encourage small scale farmer investments for farmers that are not indebted and able to productively utilize funds.
  - c. **Revised target at end of project:** Reduce end of project to USD \$8.43 million from \$24.15 million (65% reduction).

IESC will consider the recommendations presented in this evaluation report. We will need to weigh the benefits versus the costs and labor resource constraints of implementing these recommendations. We also will need to consider if implementing any of the recommendations will have unforeseen negative impact on the project, its stakeholders, or beneficiaries.

Based on the findings in this report, IESC and MOD team are happy that our development model is increasing milk production and improving milk quality. To date, we have exceeded anticipated number of beneficiaries and are seeing a high adoption of best practices due to our effective training and mentoring. It was clear from the evaluation survey that MOD supported farmers were doing better than non-MOD control farmers and that most of the key measurements of success are positively trending over time. We feel our broad strategic partnerships including relationships with 11 dairy processors will ensure long term sustainability of MOD introduced concepts and practices.

While not specifically mentioned in the report, IESC through the MOD project is proud of its robust mentoring and monitoring system which enables continuously feedback which support course corrections; personnel skills, diversity, experiences and commitment; and our commitment to focus on skills and capacity development and behavior change and not free giveaways like other NGOs and donors. Through its market orientation, MOD is successfully developing the Sri Lankan dairy industry and we are pleased to be recognized as leader in dairy sector.