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EVALUATION

Final Evaluation of the Malawi Dairy Development Alliance, Land O'Lakes Malawi

Final Report

March 2012

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Kadale Consultants

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Acronyms

ACE	Agricultural Commodity Exchange
AFS	Annual Farmer Survey
AI	Artificial Insemination
CAHNW	Community Animal Health and Nutrition Worker
CBCCs	Community Based Child Care Centers
CDP	Cooperative Development Program
CIR	Crosscutting Intermediate Result
CLLR	Crosscutting Lower Level Result
COMESA	Common Market for Eastern and Southern Africa
CREMPA	Central Region Milk Producers Association
DAHLD	Department of Animal Health and Livestock Development
DML	Dairibord Malawi Ltd
DPAL	Dairy Processors Association Limited
ESADA	Eastern and Southern Africa Dairy Association
FTF	Feed the Future
GDA	Global Development Alliance
GMF	General Mills Foundation
GSJ	GSJ Animal Health and Production Ltd
GoM	Government of Malawi
HDDS	Household Dietary Diversity Score
HH	Household Head
HQ	Head Quarters
HS	Heat Synchronization
HTC	HIV/AIDs Testing and Counseling
IR	Intermediate Result
KII	Key Informant Interview
LDL	Lilongwe Dairies Ltd
LLR	Lower Level Result
Ltr(s)	Liter(s)
M&E	Monitoring and Evaluation
MAICC	Mponela AIDS Information & Counseling Centre
MBG	Milk Bulking Group
MDDA	Malawi Dairy Development Alliance
MDFA	Mpoto Dairy Farmers Association
MDI	Malawi Dairy Industries (Ltd)
MK	Malawi Kwacha
mLtrs	Million Liters
MMPA	Malawi Milk Producers Association
mT	Metric Tonne (mT)
NAC	National Aids Commission
NAPHAM	National Association for People Living with HIV/AIDS in Malawi
NDI	Northern Dairy Industries (Ltd)
NHS	Non-Heifer Scheme (MBGs)
OVC	Orphans and Vulnerable Children
PD	Pregnancy Diagnosis
PEPFAR	(US) President's Emergency Plan for AIDS Relief
PESPS	Private Extension Service Providers
PLHIV/ PLHWA	People Living with HIV

PLLR	PEPFAR Lower Level Result
PWW	Prosperity Worldwide
PY	Project Year
Qtr	Quarter
RPAs	Regional Producer Associations
SMS	Short Messaging Services
SoW	Scope of Work
SPSS	Statistical Package for Social Sciences
US $	United States Dollar
USAID	United States Agency for International Development
VS&L	Village Savings and Loan

Exchange Rate: (MK 150: US $1) for data from the 2010 Evaluation
Exchange Rate: (MK 165: US $1) for data from the 2011-12 Evaluation

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Executive Summary

This document is the report of the final evaluation for the Land O'Lakes **Malawi Dairy Development Alliance (MDDA) Extension** conducted by Kadale Consultants in January 2012. It focuses primarily on the 15-month extension period from January 2011 to March 2012, adding to the evaluation of the first four years of the MDDA conducted in 2010.

From the Scope of Work, the **objective** of MDDA is: "*to increase incomes for rural dairy farmers and participating value chain stakeholders operating in the Central and Northern Regions of Malawi."* The **activities** of the extension period were focused on increasing the domestic dairy herd, increasing farmers and MBGs access to essential inputs and services, and increasing the profitability of farmers and MBGs from the dairy enterprise.

The **methodology and limitations** are set out in section 2. The evaluation included a survey of 200 farmers plus Committee member interviews at 17 Milk Bulking Groups (MBGs), Key Informant Interviews (KIIs) with stakeholders and with Land O'Lakes' staff, and a document review. The evaluators faced major logistical challenges due to a major fuel shortage in the evaluation period. The sample profile is set out in section 3.2.

The **findings from the farmer survey** are in section 3**.** There were 3,464 farmers, 1,730 (49.9%) women and 1,734 (50.1%) men across all supported MBGs. The number of members with cows was 1,822; a higher proportion of women members had cows (57.5%) than men (42.5%). The number of pure and high-cross breeds has increased by 4.2% over the MDDA extension, despite major problems with Artificial Insemination (AI) services.

The typical **demographic profile** (section 3.3) of the sample is a household head or their spouse, aged over 30, married, educated to primary level, living in relatively large households with a mean 6.86 members and 2.21 adults (aged 19-60).

Dairy was a primary or secondary **source of income** for 95.5% of respondents (section 3.4.2) of whom 75.5% reported it as the primary source. When dairy income data for main and secondary is combined and weighted, averaged monthly dairy income is MK 17,737 ($107), or MK 212,712 ($1,289)/year. This is an increase of 66.6% in MKs and 41.3% in US $s since 2007. It is 17.3% (MK) and 6.7% (US $) over the MDDA extension period.

The overall averaged **household expense** (section 3.4.3) was 44.5% higher than mean reported income. It is likely that income is being substantially understated, due to sales outside the MBG. A breakdown of expenses provides evidence of investment in crop and dairy activity. The averaged monthly expenditure figure was MK 40,027 ($243), which was 78.0% higher than in 2010 (MK 22,176 ($148). There was also increased expenditure on education. The 2010 sample contained some MBG members who did not yet have a cow, which probably reduced comparable expenditures.

For their dairy income, 57.4% of respondents reported spending decisions are made by husband and wife together (section 3.4.4). Spending decision-making was restricted to husbands alone in 19.0% of cases, of which most were in Central Region.

The range of **asset purchases** (section 3.4.5) suggests a substantial income impact on these households from their dairy enterprise. Notable is the high proportion that bought improved housing materials e.g. bricks (28.0%) and iron sheets (27.0%). Expenditure patterns suggest these households have excess income over living expenses.

The main **source of heifers** by far was Land O'Lakes according to 78.0% of respondents (section 3.5). As the sample was of farmers delivering milk to the MBG that day, it was unsurprising to find 91.5% of respondents had at least one cow in lactation. The **mean milk production** for the prior day of all lactating cows was 10.70 liters (ltrs). Central Region had a higher mean (11.27 ltrs) than Northern Region (9.19 ltrs). Monthly milk production **increased 26.9% in the extension period** from 312.6 ltrs in 2010 to 396.7 ltrs in 2012**.** Central Region respondents (431 ltrs) produced 38.1% more than Northern Region

respondents (313 ltrs). Milk usage figures suggest under-reporting of milk sales to vendors, corroborated by evidence elsewhere in the survey. There was an **increase in milk consumption** by farmer households from 1.22 ltrs/day in 2010 to 1.56 ltr/day in 2012.

Spending on crude protein supplements for the dairy enterprise (section 3.6) is 194% greater in Central Region than in 2010, a considerably larger factor increase than for most other expenses. This suggests that crude protein for dairy cows has been increasing and must be contributing to production growth.

Farmers reported improvements over 2010 in many areas (section 3.6.2). **Milk yield** was more commonly perceived than not by respondents to have increased in the past year (64.9% agreed vs. 31.5% who disagreed). 63.4% of respondents perceived that their **income from dairy** had increased from last year, compared to 36.6% who said it had not.

Related to MBG services (section 3.7), there was relatively high **financial inclusion** among MBG members with access to a bank account (68.0%), cow insurance (61.0%) and a village savings and loans (VS&L) scheme (42.0%) through their MBG. Getting access to (improved) dairy cows is the main reason (52.5%) for joining a MBG.

The **number of workers** (at least part time) involved in the sector increased and intensified, supporting the case for growth and increased income from dairy. Total dairy farm 'employment' increased by 19.2% from 4,440 in 2010 to 5,293 in 2012.

On the reliability, prices paid and amount of milk sold to different **milk buyers** (section 3.9), the MBG scored higher in all aspects than alternatives, but there was strong evidence of under-reporting of sales to vendors. This suggests income is under-reported.

For household nutrition (section 3.10), the overall average Household Dietary Diversity Score (HDDS) was 6.70, where a score closer to 11 indicates better dietary diversity and 0 indicates a worse dietary diversity. Central Region respondents had a slightly HDDS than those in Northern Region, but they are essentially the same.

MBG Committees were interviewed as a group and records checked (section 4). The findings support the famer survey data, and are broken down into quantitative (section 4.1) and qualitative (section 4.2) data. **Vendors** were the most common milk buyers in Northern Region, followed by Mpoto Dairy Farmers Association. In Central Region, Lilongwe Dairies was by far the main buyer. MBGs reported a higher **mean price** in Central Region (MK 62/ltr net) than in Northern Region (MK 54/ltr net). **Supplementary feed volumes** have risen steadily in Central Region, but are low and volatile in Northern Region.

There has been a large increase in average number of **orphans and vulnerable children (**OVCs) served through MBG HIV/AIDS initiatives in Central Region and a more modest increase in Northern Region. The trend was the same for ltrs of milk donated to CBCC.

The MDDA Extension **performance indicators** (section 5) are drawn from Land O'Lakes monitoring and evaluation reports, and verified through primary data in the farmer survey, MBG Committee interviews and KIIs. For the five standard **US Government indicators**, **#1 HIV/AIDS awareness** found 94.5% of the sample of 200 MBG members with cows received HIV/AIDS awareness messages through their MBG. For indicator **#2**, 1,203 **OVCs received milk** at 201% of the target and 163% of the baseline by quarter 4, For indicator **#3** 1,605 farmers, processors or others **adopted new technology** during the extension period equal to 401% of the target and 203% of the baseline. For indicator **#4 agriculture training**, the cumulative extension achievement to Qtr 4 was 5,218 individuals, at 580% of the target and 201% over the baseline. For indicator **#5** 12 **VS&L groups** for PLHIV were established at 100% of target.

For the three **MDDA result areas**, **IR 1** the original model of grants for building private sector breeders has **increased the number of dairy animals** in the breeding herd potentially available to smallholders, but not yet succeeded in getting these breeder and smallholders to function as suppliers and buyers to each other. For **LLR 1-1**, 134 **cows**

were pregnant, being 89.3% achievement of target. For **LLR 1-2,** Land O'Lakes placed 150 cows of which 87 were pure-breeds and 63 high-crosses (192% of target). This contributed to the increase in **overall herd size** reported by the MBGs

For **IR 2**, increased **quality of inputs and services**, **LLR 2-1** the percentage of farmers trained by technicians and adopting best practices up to Qtr 4 was 73.4%, which is 122.3% of target. For **LLR 2-2** the '**volume and value of dairy supplementary feeds purchased'**. The baseline for volume was 252.9 (metric) tonnes (mT) to a value of $70,900, with a target of 278.2 mT and a value of $78,000. The achievement to end Qtr 4 is 279.4 mT worth $85,500, equivalent to 100.4% and 109.5% of targets. For **LLR 2-3**, number of small scale farmers having **access to financial services,** achievement to end Qtr 4 is 2,767 individuals reached (1,260 women and 1,507 men) being 133.1% of the overall target, 132.6% of the target for women and 133.5% of the target for men. All the targets were achieved in this IR.

For **IR3 increased production and sale of milk**, the baseline is 4.7 million ltrs (mLtrs), which reflects the production total for 2010. The target for the extension was 5.2 mLtrs, with achievement to Qtr 4 at 3.4 mLtrs, being 65.9% of target and 72.8% of the baseline. The target for milk collected by the MBG was 2.1 mLtrs with achievement to Qtr 4 at 2.2 mLtrs, representing 104.2% of the target and 119.5% of the baseline. The target for the value of milk collected by the MBG is $1,065.8 thousand with achievement to Qtr 4 at $906.2 thousand, representing 85.9% of target and 97.5% of the baseline. Finally, the target for maximum sales to vendors is 2.1 mLtrs, with achievement to Qtr 4 at 1.2 mLtrs, substantially over target (inverse target). In total, these results reflect the significant problems with AI services experienced in 2010-11 due to the shortage of liquid nitrogen.

For **LLR 3-1**, **average net income percentage of farmers** in four targeted MBGs, the target was 44.0%, and achievement in Qtr 4 was 62.0%. For **LLR 3-2**, **average milk yield** for improved cow per day per cow the achievement by Qtr 4 is 12.5 ltrs/day, which increased from 11.7 ltrs/day in Qtr 1. This range of achievement is supported by the farmer survey even though it found a lower figure, at it was within the error range. For **LLR 3-3**, **volume of milk supplied to processors** and **Percentage of milk rejected** by processors, achievement by Qtr 4 was 2.1 million liters, representing 103.7 of target and 118.3% of the baseline and was 0.1% for rejection, well above the (inverse) target of 0.6%.

For **cross-cutting** results CIR HIV/AIDS and OVCs, **CLLR-PI** indicators are 'Total number of individuals trained in **HIV prevention education'** and 'Total number of **HIV prevention education** sessions conducted'. The first indicator is reported above. The second indicator achievement was 238, which was 466.7% of target. For **CLLR-P2** the target of two more OVC CBCCs supported was achieved. The target for total number of OVCs served by MBG implemented HIV activities is reported above. For ltrs of milk donated to OVC support programs, Land O'Lakes reported 5,439 liters donated being 60.4% of target (MBG Committees reported over 8,000 ltrs). Part of the shortfall is due to decreased milk production in the extension period. For people trained in nutrition, achievement to end Qtr 4 was 389 people (283 women and 106 men) being 103.7% of target.

For **CIR-Gender**, **CLLR-G1** 253 **women received CDP training** (101.2% of target) and 328 women **received human rights training** (109.3% of target). For **CLLR-G2,** a **gender survey** is being completed in March 2012. Land O'Lakes regularly conducted refresher gender courses for men and women on roles in dairy enterprises with 241 women and 257 men trained. For **environmental impacts**, **CLLR-E1,** the target was 75% of environmental regulations met in both cases. For the percentage of farmers passing environment compliance tests, achievement at Qtr 4 was 89.8%, approximately 20% over target. For MBG facilities, achievement at Qtr 4 was 88.8%, which is also 20% over target.

Three **key lessons** are highlighted in section 6. First, **identifying key risks** and practically mitigating or resolving them is a difficult matter and not the sole responsibility of the MDDA. Risks of problems with AI services and the breakdown of marketing in Northern Region were identified and Land O'Lakes responded to these. This required considerable

additional management and input beyond its planned activities. Land O'Lakes should get credit for adding this role to its activities. However, given the likely impact on the MDDA from these relatively predictable risks, the MDDA would have benefited from including more activities in the extension to address these dual risks from the outset. The consequence has been a shortfall in meeting some key targets, such as production.

A second lesson relates to the **use of evidence.** One of the many positive factors about the MDDA has been its work on feed trials, to bring a much more strongly evidence based approach. A related example is the incentivizing of PESPS at three MBGs to increase deliveries of milk. Related to this evidence based approach, there is scope for applying the same approach to other dairy inputs, such as AI/Bull insemination and other common veterinary treatments where there is some debate of the relative efficacy of these.

Another positive feature of the MDDA was how it **adapted to changes**. Although MDDA had reasonably planned to work with Airtel Money, this was contingent on Reserve Bank of Malawi approval and delayed beyond the period when the initiative would have had value. The team switched focus to procure a license for ESOKO SMS, an innovative model that could benefit from user testing and operating experience. MDDA has effectively 'bought down' the risk to enable dairy producer stakeholders to test out what they can do with it. This sort of innovation could revolutionize delivery of key production, productivity, marketing and governance messages for dispersed and relatively information poor farmers, yet it was not in the plan at the outset. Flexible responses to new developments are welcome.

In **conclusion** (section 7), the MDDA had many components. One concerns raised in the 2010 evaluation was the wide range of indictors and related activities. Although the MDDA extension dropped several indicators, it added new ones and its activities remain very complex and diverse. In many areas, the MDDA activities are part of a coherent whole and activities worked synergistically. In other areas, there was a less clear connection between activities, though each had its merits. This complex mix is a function of a complex sector, with issues ranging from breeding to marketing, HIV/AIDS to environment. If it were possible to narrow down the focus, then this might enable future programs to make even more progress than the creditable progress that MDDA made.

For most of its indicators, the MDDA extension met or exceeded its targets, some by very considerable margins. This has been the case in a difficult operating environment, including the recent problems over fuel. There were some shortfalls on targets, notably around production. In mitigation, the dairy sector faced considerable problems that undermined AI services. These services were key to MDDA and the effects have been seen in reduced access to AI, falling pregnancy rates and falling production. After a period of falling production, the measures taken appear to have halted and reversed the situation. It is important that future programs address these critical issues and act to ensure the overall sustainability of the sector going forward. Success in dairy is highly contingent on a range of inter-related factors and the breakdown in any one can derail overall progress.

Three very positive stories come out of this evaluation. First, Land O'Lakes had to make considerable change to its program and approach over the MDDA, particularly in the extension. This flexibility is welcome. The second is that the MDDA took a stronger evidenced-based approach than in the past, such as through the feed trials. This effectively raised debate and attention to the issue, and stimulated demand and supply. A similar approach is needed for other aspects of the dairy sector. Finally, the MDDA showed an exciting level of innovation in testing and 'buying down the risk' of new ideas, such as ESOKO, financial partnerships and incentivizing PESPs. This sort innovation is welcome as it enables step changes in performance and increased competitiveness. The MDDA stepped up to dairy sector challenges and brought positive change at a particularly difficult time. Although the MDDA is ending, the dairy sector still faces challenges, needing continued innovation and responsiveness from stakeholders, working collaboratively.

1 Background and Scope

This document is the report of the final evaluation for the Land O'Lakes Malawi Dairy Development Alliance (MDDA) extension, conducted by Kadale Consultants. This evaluation follows on from an evaluation in 2010 also conducted by Kadale Consultants that was designated to be final, prior to agreement on a 15-month extension of the project from January 2011 to March 2012. Details of the evaluation are included in the Scope of work (SoW) that is set out in Annex 1: Scope of Work (Abbreviated).

From the Scope of Work (SoW):

"Land O'Lakes International Development has been implementing the USAID-funded Malawi Dairy Development Alliance (MDDA) since 2007. The objective of MDDA is to increase incomes for rural dairy farmers and participating value chain stakeholders operating in the Central and Northern Regions of Malawi. The program contributes to two of the USAID/Malawi's Operational Plan Objectives of Agriculture Sector Productivity and Private Sector Competitiveness. Furthermore, MDDA facilitates the realization of several additional impacts that contribute to the Feed the Future (FTF) results for Malawi. These include "Improved Economic Performance of the Agricultural Sector" and "Improved Nutrition-Related Behaviors, such as Consumption of Nutritious Foods."

Originally scheduled to end in 2010, the program was extended for an additional fifteen months, through March 31, 2012. During the extension period the program aims for the following results as a means of achieving its overall objective:

- *Increased number of improved dairy animals available to smallholder farmers*
- *Increased access to inputs & services by small scale farmers and milk bulking groups (MBGs)*
- *Increased profitable production and sale of milk by small scale farmers & MBGs"*

"In order to successfully implement the program, Land O'Lakes partnered with many private, research, and public sector partners. Some partners include: The Department of Animal Health and Livestock Development (DAHLD), 3 producer associations, 23 MBGs, the Dairy Producers Association Limited, 4 breeders, 5 feed manufactures, 4 processors, Airtel, GALVmed, GSJ Animal Health and Production, New Building Society [NBS Bank], NICO General Insurance, Wellspring/Esoko, Mponela AIDS Information and Counseling Centre (MAICC) and the National Association for People Living with HIV/AIDS in Malawi (NAPHAM)"

*"The **program focuses** on building the capacity of farmers, MBGs, and associations to run their operations as profitable businesses. This is expected to result in farmers and MBGs making more informed, profit oriented business decisions necessary to further increase production during and after MDDA. The implementation strategies also address cross-cutting issues of HIV/AIDS, gender and environmental impact mitigation."*

*"The **objective of the final evaluation** is to assess whether the program has achieved the expected results as outlined in the results framework. Specifically, the evaluation will assess the impact of the MDDA program on the productivity and income of targeted households and enterprises. The evaluation will in addition assess program design, implementation, management, lessons learned and replicability and will be expected to establish plausible links between program inputs and outcomes/impacts, and draw lessons for improvement of future programs or similar activities"*

The 2010 evaluation study reviewed the MDDA program and its indicators in depth. The current evaluation does not repeat that work, partly because that would be unnecessarily repetitive, but also because the 2011-12 MDDA extension has a different focus and a different combination of indicators.

The MDDA extension indicators, from the extension proposal are:

STANDARD USG INDICATORS
USAID Operational Indicators
1. Number of Individuals receiving HIV/AIDS prevention interventions
2. Number of OVC served by OVC programs (OVC receiving nutritional support through 1% of milk production
3. Number of farmers, processors, and others who have adopted new technologies or management practices as a result of USG assistance
4. Number of individuals who have received USG supported short-term agriculture sector productivity training with USG assistance sex-disaggregated
5.Economic Strengthening: Number of HIV care and support associations provided with economic strengthening capacity building
CUSTOMIZED MDDA INDICATORS
IR 1: Increased number of improved dairy animals available to smallholder farmers
LLR 1.1: Improved AI services available to farmers
Number of cows pregnant because of heat synchronization (HS) and AI activity
LLR 1.2: Increased quantity of cows placed with farmers
Number of additional cows donated to small scale farmers
IR 2: Increased access to inputs & services by small scale farmers and MBGs
LLR 2.1: Improved technical capacity of production service providers
Percentage of farmers trained by CAHNW and PESPS who have adopted best practices in animal husbandry
LLR 2.2: Improved technical capacity of feed manufacturers
Volume and value of dairy supplementary feeds
LLR 2.3: Strengthened financial services available
Number of small scale farmers having *access to* financial services (disaggregated by sex)
IR 3: Increased profitable production and sale of milk by small scale farmers & MBGs
Total milk production volume and values
LLR 3.1: Improved business capacity of farmers
Average net income percentage of farmers in 4 targeted MBGs with improved cows producing
LLR 3.2: Milk production increased
Average milk yield for improved cow per day per cow
LLR 3.3: Improved market access
Volume of milk supplied to dairy processors
Percentage of milk rejected by dairy processors
CIR-HIV/AIDS & OVC: Individual mechanisms strengthened to mitigate and cope with the impacts of HIV/AIDS
CLLR-P1: Improved HIV/AIDS behavior change strategies in place
Total number of HIV prevention education sessions conducted
CLLR-P2: Improved services available to OVC through community resources
Total number of additional OVC support centers receiving milk
Total number of OVC served by MBG-implemented HIV activities
Number of liters of milk donated to OVC support programs
Total number of people trained in nutrition
CLLR-P3: Strengthened economic capacities of PLHIV
Total number of people trained in economic strengthening activities
Total number of VSL groups established
Amount of cumulative value savings by VSLs
CIR-Gender: Strengthened equality between men and women within households
CLLR-G1: Financial empowerment of women strengthened
Number of women receiving CDP training
Number of women receiving human rights training
CLLR-G2: Dairy farming responsibilities between men and women more equally shared
Survey conducted
CIR-Environment: Strengthened mechanisms in place to prevent negative environmental impacts by the dairy industry
CLLR-E1: Increased number of private sector stakeholders complying with environmental
Percentage of smallholder dairy farms passing the MDDA environmental compliance test
Percentage of MBG cooling facilities passing the MDDA environmental compliance test

In brief, the evaluation focuses on providing evaluation data on these indicators of performance through a survey of 200 farmers, meetings at 17 Milk Bulking Groups (MBGs), Key Informant Interviews (KIIs), Interviews with Land O'Lakes staff and management, a review of key documents and other data held by Land O'Lakes and the MBGs. More details of the methodology are contained in section **Error! Reference source not found.**.

While the evaluation does not seek to repeat the content of the 2010 evaluation, it does relate many of the findings for the extension to those for the 2010 evaluation and in some cases, such as income, all the way back to the 2007 baseline.

The evaluation addresses questions of relevance, effectiveness, outcomes and impacts, efficiency, lessons, sustainability and cross cutting issues.

The structure of the report is an outline of the Methodology and Limitations (section 2), Farmer Survey Findings (section 3), MBG Findings (section 4), Performance Indicator Findings (section 5), Lessons and Recommendations (section 6), and Summary (section 7).

The following annexes are included:

Annex 1: Scope of Work (Abbreviated),

Annex 2: Composition of the Team, Annex 3: List of Sites Visited and Persons Consulted, Annex 4: Key Sources Consulted, Annex 5: Farmer Questionnaire, Annex 6: MBG Interview Instrument, Annex 7: MBG Activities.

2 Methodology and Limitations

This section sets out the methodology and then its limitations.

2.1 Methodology

This section explains the methodology that was devised and refined in consultation with Land O'Lakes for achieving the evaluation objectives.

2.1.1 Inception and Literature Review

The evaluation commenced with an inception meeting between Kadale and Land O'Lakes Malawi. A detailed workplan and methodology protocol were developed and approved. Kadale then undertook a comprehensive review of the relevant literature that informed the instruments for the farmer survey, MBG Committee interview and KII questions. A full list of sources reviewed is contained in Annex 4: Key Sources Consulted.

2.1.2 Indicators

The baseline and targets for each indicator were taken from Appendix F of the MDDA extension proposal. These are reported on quarterly and the indicators, baseline and performance to end of Quarter (Qtr) 4 are set out and analyzed in section 5.

2.1.3 Groups for the Evaluation

The SoW requested assessment of a range of target groups; this list was modified in discussion with Land O'Lakes. The final list of groups planned for interviews was:

1. Farm Families - 3,396 (sample of at least 200 families)

2. MBGs – 18 in Northern and Central Regions

3. Regional Producer Associations (RPAs) – (Central Region Milk Producers Association (CREMPA) and Mpoto Dairy Farmers Association (MDFA)

4. National Producer Association - Malawi Milk Producers' Association (MMPA)

5. Dairy Processors - Lilongwe Dairies (LLD), Malawi Dairy Industries (MDI) and MDFA

6. Input suppliers - two feed manufacturers, three veterinary companies, six cattle breeders

7. Government – DAHLD

8. Other leverage partners in financial services and extension services - (NBS Bank, NICO General, Esoko/Wellspring)

9. HIV/AIDS partners – MAICC & NAPHAM

The changes reflected practical issues. For example, it was decided not to meet the Dairy Processors Association Ltd (DPAL), as there had been no initiatives directly involving it in the extension and its representatives were met in the 2010 evaluation. For the processors, Northern Dairies (NDI) had closed operations. For input suppliers, many of these were met in the previous evaluation, and there was limited value in a further one-to-one meeting. Therefore, these were meet at a specially convened grantee close out meeting.

2.1.4 Farmer Survey

Kadale adapted the method of sampling farmers compared to the 2010 Annual Farmer Survey (AFS). Previously, farmers were randomly selected from a full listing and invited by the MBG Committee to come for interview. For the 2012 survey, farmers were randomly sampled as they arrived at the MBG to deliver milk. Those that come to the MBG are predominantly those with lactating cows, as they have milk to deliver, though other farmers could come for other reasons, There was no indication that the category of farmers with

non-lactating cows would more likely be particular categories of farmers, such as female-headed households, and therefore the risk of bias was judged to be limited.

A second difference was that in the 2010 AFS, farmers were selected from a list including those without cows. The result of this was that on issues related to the dairy enterprise, the 'effective' sample of respondents was less than the total sample, making the calculations less reliable.[1] As much of the information for the evaluation only makes sense for farmers with cows (particularly pure-breeds or high cross-breeds), only those farmers with at least one improved cow were interviewed were interviewed for the 2012 survey.

The MDDA has worked with 23 MBGs over time, but there has been more focus on MBGs where there is a concentration of good quality cows, particularly in the extension period. In discussion with Land O'Lakes, it was agreed that Sonda, Lilongwe Bridge, Mpasa, Majiga, and Chikwina were too small to be worthwhile visiting, especially given the logistical challenges created by the fuel shortage. The time saved was re-allocated to MBGs with more improved animals and more activities, particularly the four focal MBGs of Chitsanzo, Dzaonewekha, Machite and Magomero. This is in keeping with the methods used in previous AFSs, which also focused on 18 MBGs, so comparability was maintained.

For sampling purposes, the population was determined to be farmers with at least one pure or high cross-breed cow ('improved cows') from 18 MBGs. Based on advice from Land O'Lakes, the figures for 'Members with Cows' is an acceptable proxy for 'Members with at least one improved dairy cow' for sampling purposes.

The selected population of farmers with at least one improved cow from the 18 MBGs was compared demographically to the overall population of all members from 23 MBGs. The table below shows that the differences between the profile of the selected 18 MBGs and all 23 MBGs were minimal, both in members with and without cows.

Table 1: MBG Membership with and without Cows, by Sex and Region, January 2012

MBG Members All (%)	Region				Total			
	Northern		Central					
	Male	Female	Male	Female	Male	Female	Northern	Central
All 23 MBGs	39.2%	60.8%	53.2%	46.8%	50.1%	49.9%	22.7%	77.3%
18 sampled MBGs	38.7%	61.3%	50.3%	49.7%	47.8%	52.2%	22.3%	77.7%
MBG Members with Cows (%)								
All 23 MBGs	39.6%	60.4%	45.9%	54.1%	43.9%	56.1%	31.6%	68.4%
18 sampled MBGs	**37.4%**	**62.6%**	**44.0%**	**56.0%**	**42.0%**	**58.0%**	**29.8%**	**70.2%**

Source: Land O'Lakes from the MBGs

An improved dairy cow was defined as a pure (e.g. Friesen, Holstein and Jersey) or high-cross (6/8ths or higher pure). As in the 2010 AFS, the sample selection was proportional to population, compatible with logistics. The actual sample achieved a 69.5%:30.5% split between Central and Northern Regions respectively, reflecting to two significant figures the selected population's regional proportions (see Table 4).

The final sample profile was:

Table 2: Farmer Sample Profile, by MBG

Region	MBG Name	Target # of interviews	Actual # of interviews	Actual %
Northern Region	Chakhola	10	10	5.0%

[1] Approximately one third of respondents in 2010 did not own a cow and therefore were not able to answer production, productivity and income questions.

	Doroba	6	6	3.0%
	Kapacha	11	11	5.5%
	Kavuzi	9	9	4.5%
	Kawindula	9	9	4.5%
	Lukonkhowe	6	6	3.0%
	Lusangazi	10	10	5.0%
	Sub-total	61	61	30.5%
Central Region	Chitsanzo	21	16	8.0%
	Dzaonewekha	20	24	12.0%
	Gondoli	8	8	4.0%
	Likuni	8	8	4.0%
	Lumbadzi	15	13	6.5%
	Machite	23	15	7.5%
	Nkhweza	8	0	0.0%
	Magomero	20	21	10.5%
	Mpalo	18	17	8.5%
	Mponela	7	7	3.5%
	Namwiri	10	10	5.0%
	Sub-total	158	139	69.5%
Grand Total		**219**	**200**	**100.0%**

Source: Consultant Survey, n=200

The target sample was 219 dairy farmers, though the final sample size was 200. As discussed in the limitations section below, lack of fuel and other logistical challenges prevented targets being met at some MBGs, such as Nkhweza, Chitsanzo and Machite.

The consultants updated the 2010 AFS instrument based on the extension period focus and Land O'Lakes' requirements. The instrument was refined in discussion with Land O'Lakes' staff and through piloting. It was translated into ChiChewa and tested in a further pilot. The final instrument (English version) is in Annex 5: Farmer Questionnaire.

The field team was trained in the sampling and instrument, followed by practice interviews for half a day at Lumbadzi MBG, observed by the Land O'Lakes M&E Specialist.

2.1.5 MBG Committee Survey

Land O'Lakes' compiled a summary list of which MBGs were involved in different MDDA activities (see Annex 7: MBG Activities). The interview questions for MBG Committees were updated from 2010 to reflect the activities in the MDDA extension period (Annex 6: MBG Interview Instrument).

The consultants interviewed MBG Committee members collectively about MBG operations, membership and MDDA support activities for members, such as training, provision of milk to orphans and vulnerable children (OVCs), environmental standards, etc. A check of MBG records was undertaken to verify some of the information given by the Committee in the interview. As well as the (200) famer interviews, five farmers with different profiles, such as female-/male-headed households were interviewed in more detail for short case studies.

Finally, digital photographs captured relevant scenes; 30 are provided to Land O'Lakes in a separate file/CD.

2.1.6 Key Informant Interviews

KIIs with the two RPAs (CREMPA and MDFA), the MMPA, processors and other leverage partners were undertaken as follows:

Table 3: Categories of Key Informant Interviews

Key Informant Group	# of interviews Conducted
Regional Producer Associations	2
National Producer Association	1
Dairy Processors	2
Input Suppliers (via Grantee meeting)	7
Other Leverage Partners	3
DAHLD (Government)	1

Source: Consultants

Of the expected list, it was not possible to meet MDI. Several attempts were made to meet GSJ, but the key person was not available during the review period. GSJ had been met in 2010 and so information is taken from Land O'Lakes' reports and from a presentation that was made on its behalf at the Grantee meeting. A list of interviewees is contained in Annex 3: List of Sites Visited and Persons Consulted

2.1.7 Kadale Team and Logistics

The logistics were planned by the Kadale in collaboration with the Land O'Lakes. The plan was intended to be flexible as logistical challenges were expected with fuel supply. Land O'Lakes assisted by contacting MBGs and requesting co-operation; the consultant and field team followed up by contacting MBG Committees to confirm visits, inform them of change of plans (if applicable) and request necessary personnel to be available.

The team members are listed in Annex 2: Composition of the Team. The list of MBGs visited and persons consulted is in Annex 3: List of Sites Visited and Persons Consulted

2.2 Limitations

A number of anticipated and unanticipated limitations were identified.

2.2.1 Coverage of MBGs and Fuel Shortage

The sampling of MBGs excluded five MBGs that had limited numbers of farmers with improved animals, such that it would be difficult to get a useful sample from them. This follows the practice of previous AFSs that took a similar focused approach so was not deemed to be a problem.

During the fieldwork, Malawi experienced a severe fuel crisis that meant the Kadale vehicle (petrol) could not be used. Land O'Lakes provided a 4x4 vehicle (diesel) for Northern Region MBGs. Once the diesel ran out, the fieldwork team used public transport to reach some Central Region MBGs. This meant that the number of interviews was reduced for some MBGs, as the team took longer to get to the MBG and so had less time available when farmers were present. In other cases, the team split up so that at least where two MBGs were planned to be seen the same day, least one team member got to each MBG. Some MBGs were revisited (unplanned) to ensure quotas were filled wherever possible.

In response to the resulting shortfalls in interviews, the number of field days was extended to ensure that 200 interviews were conducted. The team visited Nkhweza MBG, but did not find anyone present, hence no interviews were recorded. It was ascertained that the MBG had not been operational for the previous two weeks, which had not been communicated to the team. Due to time constraints and lack of a vehicle, the field team moved on to ensure that the MBG and farmer interviews for that afternoon could be done. As a result, the team interviewed at 17 MBGs against the intended target of 18. In the prevailing circumstances, the field team did well to reach 17 MBGs and achieve the minimum target for interviews.

2.2.2 Fewer Farmers at MBGs in Afternoons

It was planned to visit two smaller MBGs per day by attending one in the morning and the other (generally the smaller of the two) in the afternoon. However, at Kawindula MBG it was identified that farmers at smaller MBGs were less likely to visit twice a day, and so the afternoon session was poorly attended. This was overcome by the Field Research Supervisor calling the smaller MBGs in advance to ask the MBG Committee to ask members to deliver milk in the afternoon on the research day. These methods were less efficient and contributed to a slight shortfall for some MBGs, but were not judged to be a serious limitation.

2.2.3 Incomplete MBG Committee Records

For most MBGs, the Secretary was the key person to provide accurate records on MBG activities. Therefore, the field team requested the Secretary be present for interview and that written records be available. However, in some cases, the Secretary could not be present due to other commitments and so access to records in these cases was more limited. To mitigate this, the consultant made follow up calls to the MBG Committee until all available data was collected. In a few cases, there was still missing or incomplete data.

In several cases, the MBG Committee was recently elected. When seeking to check records, it transpired that some were reportedly lost or not yet available due to the 'hand over' period. In other cases records were inconsistently kept. The issue of MBG record keeping is known to Land O'Lakes, particularly as some MBGs elect officials on their personalities rather than their technical competence and even literacy skills. This requires regular training and monitoring, but overall, the consultant observes that MBG record data was more consistently available and collected than in the 2010 AFS.

2.2.4 Data Reliability

In the sample, there were ten percentage points more male than female respondents (see Table 5), while in the selected population there were 16 percentage points more female than male potential respondents. The regional gender splits shows that females were slightly under represented in Northern Region (55.7% sampled vs. 62.6% population), but more under represented in Central Region (39.6% sample vs. 56.0% population).

The same pattern of more women respondents in Northern Region and more male respondents in Central Region occurred in the 2010 AFS when farmers were randomly selected and invited to come to the MBG. However, the 10 percentage point gap this time was less than the 18 percentage point gap in the 2010 AFS due to a higher proportion of female respondents in Central Region in 2012 (39.6%) than in 2010 (37.0%). The field research team observed that women in Northern Region were more patient and willing to wait than the men, and more involved in MBG Committee activities in Northern Region.

The reason for this apparent under-representation is not clear. The research team included a male and a female enumerator, so this does not appear to be a relevant factor. Selection of respondents at the MBG was randomly applied and resulted in a better balance than the previous approach of inviting randomly selected farmers from a listing.

There are three identified possible explanations. The first is that 'husbands' in Central Region are more likely to deliver milk to the MBG, either because they are better able to travel for practical and cultural reasons or it is seen as their role as household head (HH). It is possible that the actual owner of the cow is the husband and not the wife as registered (see comments in section 3.2). A final reason is that if the MBG informed members that researchers were coming, men may have been more likely to be attended the MBG that day, in order to represent the views of their household which they would perceive to be their role and responsibility.

It may appear that an alternative method of going out to each household would have got more women respondents. However, even if an interview is conducted with the wife at home, it is difficult to exclude the husband as the HH from being present and responding on behalf of the family. The responses of women may also be different if the husband is present. The issue of getting wives' views independently of their husbands is a difficult social research issue.

Despite the sample imbalance, the consultants view is that it is not a substantial concern or limitation. The survey questions were mainly on issues that have gender neutral responses that either men or women would be able to answer on behalf of the household, such as the household situation, services from the MBGs and production. Where it may make a difference is on questions such as views on household decision-making. There might also be differing responses on income and expenditures, as men may know more about some income and less about the some expenditures, and vice versa.

Overall, the difference between the sample and population proportions of women is not a substantial concern, but it does require taking note of in relation to a few questions where responses may not be gender neutral. .

Data inconsistencies from the farmer interviews were infrequent and each case was investigated and resolved. Data cleaning was undertaken prior to generating tables, and any inconsistencies were resolved by going back to the original questionnaires and in some cases asking the researcher to clarify.

As discussed in the later sections, farmers in Northern Region have sold milk to vendors, rather than to the MBG due to the breakdown of the marketing arrangements. Since the price and the regularity at which vendor buy milk is much more variable than the MBG, the ***income*** figures for Northern Region should be treated with some caution. These factors make it harder for farmers to estimate/recall their income, and farmers may under-report selling to vendors rather than the MBG to which they know they are supposed to sell.

As with income, collecting ***expenditure data*** is difficult as it depends on recall. Spending may be very uneven, particularly as it is often related to variable income flows. Actual spending can also be made by several household members, even if the HH is making the main expenditure decisions. Some expenditures are one off (assets) or irregular (medical), so it is difficult to be sure all spending is captured and correctly averaged per month or year.

As with previous AFSs, there was an inconsistency between household income and mean household expenditure. In principle, these two figures should be approximately equal allowing for a certain amount of saving and borrowing to smooth them. From the consultant's experience, income data is generally less reliable than expenditure data, as respondents may under-report this in a society where jealousy is a major cultural factor. However, expenditures can also be overstated if there is an expectation of support. This is a complex issue that affects the baseline and other AFSs and discussed alongside the data in section 3.4.

2.2.5 Comparability of Data

The 2010 evaluation discussed its comparability with previous AFS surveys. Therefore, this section focuses primary on any limitation in comparability between 2012 and 2010 AFS.

The 2010 farmer sample was 185 and previous studies were in the range 180-240. The final sample size for the 2012 final evaluation was 200. The difference in sample size is therefore limited, but due to the decision to focus on farmers with improved lactating cows, and exclude those without cows, the 2012 sample actually has a higher proportion of respondents on issues such as the dairy enterprise, MBG services, production and dairy income than previous AFSs. This reduces the margins of error and gives more robust data.

The 2012 survey instrument was based on the 2010 AFS, but some questions were altered, dropped and added to reflect the focus of the extension period and lessons from that

evaluation. Therefore, not all questions in the 2012 survey are directly comparable with the 2010 AFS results. Although this means some questions were not comparable, most were and these comparisons are drawn out in the narrative.

Regarding income data, respondents in the 2010 AFS gave their minimum and maximum monthly incomes; the means of the minimum and maximum were calculated; and then the mean of these two values was determined. However, respondents in 2012 reported their average monthly income directly. The consultant felt that the 2012 method was superior, but would still produce results that are still broadly compatible.

Overall, there are inevitably some limitations. Over the life of the MDDA, there have been changing indicators, as well as changes in the way the AFSs were conducted compared to the baseline. In the consultant's view, the 2010 and 2012 are more directly comparable than were previous AFS, and over the course of the MDDA, limitations in methods have been progressively addressed resulting in more robust data. It is recognized that there are persistent limitations in the methodology particularly over the accuracy of income and expenditure data. This is a wider research limitation that goes far beyond the MDDA.

3 Farmer Survey Findings

This section sets out the main findings from the 2012 farmer survey. Although not formally requested in the SoW to be an AFS, it is nonetheless directly equivalent to the AFS from previous years, particularly the 2010 AFS that was conducted by the same consultants.

The 2010 evaluation provided a comparison with the baseline, the 2008 AFS and 2009 AFS. For this evaluation, the comparison is made directly with the 2010 survey rather than repeat the earlier comparisons, since this Final Evaluation focuses on the 15-month MDDA extension period. However, where appropriate, comparison is made with earlier periods. While the findings are broadly comparable, any specific limits are noted in the narrative.

3.1 Farmer and Cow Population

The overall numbers of dairy cows and farmers by MBG, sex and region is recorded by the MBGs and collated by Land O'Lakes. This represents the overall target population for the program as at December 2011 and is set out below:

Table 4: Farmer and Dairy Cow Population, by MBG (December 2011)

	Total Number of Cows				All Members			Members without Cows		
MBG	**# Pure**	**# Cross**	**# Local**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Lusangazi	32	67	-	99	43	69	112	30	51	81
Chakhola	65	24	-	89	65	29	94	23	58	81
Doroba	16	59	3	78	17	87	104	17	39	56
Lukonkhowe	52	6	187	245	38	40	78	16	38	54
Chikwina	4	85	18	107	20	36	56	30	20	50
Kawindula	39	36	9	84	31	41	72	30	35	65
Kapacha	83	-	-	83	29	79	108	29	54	83
Sonda	32	56	17	105	30	34	64	19	28	47
Kavuzi	50	73	2	125	35	63	98	34	25	59
Total - Northern	**373**	**406**	**236**	**1,015**	**308**	**478**	**786**	**228**	**348**	**576**
Dzaonewekha	86	69	481	636	150	109	259	49	52	101
Lilongwe Bridge	6	12	40	58	68	6	74	33	3	36
Gondoli	23	20	117	160	60	70	130	10	8	18
Likuni	110	5	50	165	44	47	91	21	27	48
Nkhweza	39	15	3	57	78	76	154	28	22	50
Namwiri	96	7	2,587	2,690	116	185	301	42	30	72
Mpasa	25	20	5	50	152	41	193	19	24	43
Machite	40	337	40	417	140	60	200	81	180	261
Lumbadzi	121	19	8	148	99	107	206	70	75	145
Mpalo	103	72	25	200	152	150	302	48	56	104
Chitsanzo	302	25	3	330	127	136	263	66	83	149
Magomero	174	38	1	213	150	100	250	66	83	149
Mponela	38	6	460	504	51	111	162	17	17	34
Majiga	26	40	0	66	39	54	93	22	14	36
Total - Central	**1,189**	**685**	**3,820**	**5,694**	**1,426**	**1,252**	**2,678**	**572**	**674**	**1,246**
Total all MBGs	**1,562**	**1,091**	**4,056**	**6,709**	**1,734**	**1,730**	**3,464**	**800**	**1,022**	**1,822**

Source: Land O'Lakes from the MBGs

According to the data, the overall number of members was 3,464, of which 77.3% are in Central Region. This compares to 2,555 members in the 2010 evaluation, of which 70.8% were in Central Region and 29.2% in Northern Region. **According to the MBG records, the target population of MBG members has increased by 35.6% during the extension.**

There were 1,730 women and 1,734 men members, representing exactly half each (49.9% female). The Northern Region continues to have a higher proportion of female farmers at 60.8%, but there has been an increase in women members in Central Region reaching 46.8%. In 2010, women accounted for 45.8% of MBG members and men for 54.2%. **The**

2012 data suggests that the membership gender gap has reduced. Interestingly, a higher proportion of women members had cows (58.0%) than men (43.0%).

Based on the above data, there were 6,709 cows at the 23 MBGs. Of these, there were 1,562 pure-breeds ('pures'), 1,091 cross-breeds ('crosses') and 4,056 local-breeds. In 2010, the total of 9,512 dairy cows consisted of 1,347 pures, 1,200 crosses and 6,965 local cows. The data for 2010 was considerably distorted by 4,844 local dairy cows for Mponela and 1,013 for Namwiri. For 2012, the reported figures for Mponela have declined to 480 local cows and for Namwiri have increased to 2,690. The net fall in local cows and overall dairy cow numbers is mainly explained by the changes reported by these two MBGs. The discrepancy results from a change to the way data was collected in the extension period. It was found to be very difficult to keep records on the number of local cows and so data collection focused purely only on improved cows; thus the change in the number of local cows should not be seen as reliable.

However, irrespective of this point, although members with local cows also benefited from training and better functioning MBGs, the focus of Land O'Lakes has been to grow the size of the improved herd. Comparing 2012 to 2010 data, the number of pures has increased by 215 (16.0%), while the number of crosses has declined by 109 (9.1%). This has occurred against a background of major problems experienced in breeding services, mainly the severe shortage of liquid nitrogen,[2] would have impacted very negatively on conception rates and ultimately on reported animal numbers. The increase in the number of pures partly reflects the additional number of pures that were supplied by Land O'Lakes in the period. Compared to 2010, the other trend is that the approximately equal split between pures and crosses has shifted decisively in favor of pure breeds over crosses.

Overall, **the number of pure and cross breeds has increased from 2,547 to 2,653, an overall increase in the period by 4.2%,** which is very positive given the very difficult breeding conditions and decline in pregnancy rates.[3]

3.2 Sample Profile

This section profiles the 200 farmers and their households that were sampled for the evaluation. Some issues are relevant to the methodology section, but are included here as they are also key findings.

Table 5: Sex of Respondents, by Region

Q.1-002 Sex of Respondent	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Male	27	44.3%	84	60.4%	**111**	**55.5%**
Female	34	55.7%	55	39.6%	**89**	**44.5%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

As noted, in th sample there were more female respondents in Northern Region and more male respondents in Central Region resulting in a net 10 percent more male than female respondents. Looking at the regional gender splits shows that females were slightly underrepresented in the Northern Region (55.7% of the sample vs. 62.6% of the population) but more heavily underrepresented in Central Region (39.6% in the sample vs. 56.0% in the population). There is a discussion on the representation in 2.2.4 Overall, the sample is more balanced between men and women respondents than previous AFSs.

[2] Liquid nitrogen is essential for Artificial Insemination to keep bull semen alive until the cow is inseminated by a technician. Without liquid nitrogen, AI services cannot function.

[3] Furthermore, calves born at or around the time of the fieldwork may not have been captured yet in the totals recorded by the MBGs, so the current figures may be higher than the consultant was able to obtain.

Table 6: Number of Cows Owned by the Household, by Region

Q.1-02 How many dairy cows do you or your household own?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
One	23	37.7%	48	34.5%	**71**	**35.5%**
Two	25	41.0%	68	48.9%	**93**	**46.5%**
Three	10	16.4%	14	10.1%	**24**	**12.0%**
Over three	3	4.9%	9	6.5%	**12**	**6.0%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

The 2012 sample differs from the previous (2010) sample, as MBG members without cows were not included in 2012. This makes comparisons more difficult on this issue.

The most common finding was that respondents owned two cows (46.5%). Overall, 74.5% had more than one cow and 18.0% owned three or more. There was little difference in the number of cows owned between the two regions, with slightly higher ownership in Northern Region. No difference was found in the ownership patterns between male and female respondents; this is encouraging from a gender perspective.

Table 7: Breed of Cow(s), by Region

Q.1-03 What breed(s) is/are your cow(s)?		Region				Total	
		Northern		Central			
		#	%	#	%	#	%
Cow 1	Pure	45	73.8%	125	89.9%	**170**	**85.0%**
	Cross (7/8ths or 6/8ths)	16	26.2%	14	10.1%	**30**	**15.0%**
	Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**
Cow 2	Pure	25	64.1%	76	83.5%	**101**	**77.7%**
	Cross (7/8ths or 6/8ths)	13	33.3%	14	15.4%	**27**	**20.8%**
	Cross (5/8ths or less)	1	2.6%	1	1.1%	**2**	**1.5%**
	Total	**39**	**100.0%**	**91**	**100.0%**	**130**	**100.0%**
Cow 3	Pure	8	61.5%	15	62.5%	**23**	**62.2%**
	Cross (7/8ths or 6/8ths)	4	30.8%	9	37.5%	**13**	**35.1%**
	Cross (5/8ths or less)	1	7.7%	0	0.0%	**1**	**2.7%**
	Total	**13**	**100.0%**	**24**	**100.0%**	**37**	**100.0%**
Cow 4	Pure	1	33.3%	5	55.6%	**6**	**50.0%**
	Cross (7/8ths or 6/8ths)	1	33.3%	3	33.3%	**4**	**33.3%**
	Cross (5/8ths or less)	1	33.3%	0	0.0%	**1**	**8.3%**
	Zebu	0	0.0%	1	11.1%	**1**	**8.3%**
	Total	**3**	**100.0%**	**9**	**100.0%**	**12**	**100.0%**
	Combined Totals						
	Pure	79	68.1%	221	84.0%	300	**79.2%**
	Cross (7/8ths or 6/8ths)	34	29.3%	40	15.2%	74	**19.5%**
	Cross (5/8ths or less)	3	2.6%	1	0.4%	4	**1.1%**
	Zebu	0	0.0%	1	0.4%	1	**0.3%**
	Total	**116**	**100.0%**	**263**	**100.0%**	**379**	**100.0%**

Source: Consultant Survey, n=200 farmers, 379 cows

Only respondents with at least one improved cow (pure or 6/8th cross or higher) were interviewed. They were asked to list their most pure animal first, which explains the increasing proportion of crosses with the number of cows owned. It is noteworthy that even

for the second animal; the proportion of pure breeds is still over three quarters, ***suggesting a generally high quality of herd***.

The proportion of pure breeds was higher in Central Region (84.0%) compared to the Northern Region (68.1%) in this sample. Overall, 79.2% of the cows in the sample were pure breeds. In the 2010 survey, 83.0% of cows were pure breeds, but the average number of animals owned was lower at close to one, compared to two in the 2012 sample. The 2012 sample shows that incremental cows owned tend to be more likely to be crosses, but that for the first animal the proportion of pures was 85.0%, which is comparable to the proportion for the 2010 sample at 83.0%.

Table 8: Breed of Cow(s) Summary, by Region

Q.1-03 What breed(s) is/are your cow/s?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Pure	79	68.1%	221	84.0%	300	79.2%
Cross (7/8ths or 6/8ths)	34	29.3%	40	15.2%	74	19.5%
Cross (5/8ths or less)	3	2.6%	1	0.4%	4	1.1%
Zebu	0	0.0%	1	0.4%	1	0.3%
Total	**116**	**100.0%**	**263**	**100.0%**	**379**	**100.0%**

Source: Consultant Survey, n=200 farmers, 379 cows

The proportion of pure-breeds was higher in Central Region (84.0%) than Northern Region (68.1%), which may reflect the greater focus in distribution of pure-breeds by Land O'Lakes in Central over recent times. However, most of the remaining cows in Northern Region were still high-end crosses (6/8th or higher at 29.3%). This pattern was similar in 2010.

3.3 Demographic Profile

Household demographic data were collected using the same questions as in the 2010 AFS. The results are very similar. Where discrepancies occur, these are outlined in the narrative.

Table 9: Household Head as Respondent, by Region

Q.1-04 Are you the household head?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Yes	39	63.9%	85	61.2%	124	62.0%
No	22	36.1%	54	38.8%	76	38.0%
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

The majority of respondents in the sample were HHs (62.0%). There was little variation between the regions and only a small difference with 2010 (at 66.5%), which may reflect the higher proportion of women in the 2012 sample.

Table 10: Respondent Relationship to Household Head, by Region

Q.1-05 What is your relationship to the household head?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Husband/Wife	21	95.5%	44	81.5%	65	85.5%
Son/Daughter	1	4.5%	8	14.8%	9	11.8%
Son/Daughter in Law	0	0.0%	1	1.9%	1	1.3%
Brother/Sister	0	0.0%	0	0.0%	0	0.0%
Mother/Father	0	0.0%	0	0.0%	0	0.0%
Grand Child	0	0.0%	1	1.9%	1	1.3%
Niece/Nephew	0	0.0%	0	0.0%	0	0.0%
Other	0	0.0%	0	0.0%	0	0.0%
No Response	0	0.0%	0	0.0%	0	0.0%
Total	**22**	**100.0%**	**54**	**100.0%**	**76**	**100.0%**

Source: Consultant Survey, n=76

Of those respondents who were not HHs, the majority identified themselves as 'Husband/Wife' of the HH (85.5%).

Table 11: Respondent Age, by Region

Q.1-06 What is your age?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
16 - 30	6	9.8%	12	8.6%	18	9.0%
31 - 45	25	41.0%	43	30.9%	68	34.0%
Over 45	30	49.2%	84	60.4%	114	57.0%
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

Over half of the sample was over the age of 45 (57.0%). The proportion of over 45's was 11.2 percentage points higher for Central Region respondents. There were very few (9.0%) respondents from the 16-30 age group; this was a common feature in both regions and similar to the 2010 AFS.

Table 12: Respondent Marital Status, by Region

Q.2-01 What is your marital status?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Married (monogamy)	44	72.1%	115	82.7%	**159**	**79.5%**
Widowed	9	14.8%	6	4.3%	**15**	**7.5%**
Single/Engaged	0	0.0%	12	8.6%	**12**	**6.0%**
Married (polygamy)	5	8.2%	5	3.6%	**10**	**5.0%**
Separated/Divorced	3	4.9%	1	0.7%	**4**	**2.0%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

The vast majority of respondents (84.5%) were married and, of these, most were monogamous marriages (79.5%). There was a slight variation between Northern and Central Regions, with polygamy more common in Northern Region (8.2% vs. 3.6%). There was also a higher proportion of separated/divorced and widowed respondent in Northern Region and a higher proportion of single/engaged respondents in Central Region. This might also be a factor in why more women were interviewed in Northern Region, as they were more likely to attend the MBG if they were not married. The higher proportion of

widows in Northern Region was also observed in the 2010 study, though it is difficult to draw a conclusion due to the size of the sample.

Table 13: Household Size, by Region

Q.2-02 What is the total number of household members (grouped)?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
1 to 4 members	6	9.8%	18	12.9%	**24**	**12.0%**
5 to 8 members	37	60.7%	98	70.5%	**135**	**67.5%**
9 to 12 members	16	26.2%	23	16.5%	**39**	**19.5%**
13 and above	2	3.3%	0	0.0%	**2**	**1.0%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**
Mean	**7.36**		**6.59**		**6.86**	

Source: Consultant Survey, n=200

The most common grouping of household size was 5-8 members (67.5%), with a mean household size for the sample of 6.86 members. The mean household size was 0.77 of a member larger in Northern Region (7.36) over Central Region (6.59).

The pattern is similar to the 2010 survey. In both 2012 and 2010 the household sizes are greater than the average in the 2008 National Census which was 4.6. This suggests that MBG households are somewhat larger than the national average. The Census also found a higher average family size in Northern Region compared to Central Region by 0.7 household members, which supports the accuracy of the sampling.

Table 14: Mean Children per Age Category, by Region

Q.2-03 In your household, how many children are….?	Region		Total
	Northern	Central	
	Mean	Mean	Mean
Under 5 years	**1.46**	**1.08**	**1.2**
6 - 12 years	**1.66**	**1.52**	**1.56**
13 - 18 years	**1.36**	**1.15**	**1.22**
Orphans	**0.97**	**0.35**	**0.54**

Source: Consultant Survey, n=200

Sampled households in Northern Region had more children from every age group, as well as more orphans than in Central Region. As found in the 2010 AFS, **these results indicate that dairy farmers support a relatively high number of young dependents.** Socio-economic and cultural factors mean it is likely that people with a regular income (such as dairy farmer) support a higher number of dependents beyond their immediate family.

Table 15: Mean Adults per Age Category, by Region

Q.2-04 In your household, how many adults are ...	Region		Total
	Northern	Central	
	Mean	Mean	Mean
Aged 19 - 60	**2.56**	**2.48**	**2.21**
Over 60 years	**0.26**	**0.4**	**0.36**
Chronically ill	**0.13**	**0.01**	**0.05**

Source: Consultant Survey, n=200

Less variation was observed between the two regions in the number of adult members from different age groups. Notably, households in Central Region had more members over 60 years old, but those in Northern Region had more chronically ill members.

Table 16: Education Level, by Region

Q.2-05 What is the highest level of education you achieved?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
No formal education	1	1.6%	21	15.1%	**22**	**11.0%**
Primary 1-8	42	68.9%	93	66.9%	**135**	**67.5%**
Secondary 1-2	9	14.8%	15	10.8%	**24**	**12.0%**
Secondary 3-4	9	14.8%	10	7.2%	**19**	**9.5%**
Tertiary	0	0.0%	0	0.0%	**0**	**0.0%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

Overall, the majority of respondents had primary education only (67.5%) with little variation between the two regions in this category. In general, Northern Region respondents were educated to a higher level than those in Central Region; notably 15.1% of Central Region respondents reported no formal education compared to only 1.6% in Northern Region. The proportion of those with secondary education was also higher in the Northern Region (29.6%) compared to Central Region (18.0%). There were no respondents with tertiary education in the sample. Overall, this is similar to the education profile in the 2010 AFS.

Table 17: Ability to Read and Write, by Region

Q.2-06 Can you read and write?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Yes	54	88.5%	116	83.5%	170	85.0%
No	7	11.5%	23	16.5%	30	15.0%
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

Most respondents (85.0%) reported being able to read and write; there was some variation between the regions, with Northern Region respondents more likely to report being able to read and write than in Central Region, almost exactly the same profile as in the 2010 AFS.

In summary on the demographic profile, the sample was predominantly household heads or their partners, aged over 30, married, educated to primary level (Standards 1–8) and living in relatively large households with an average of 6.86 members and 2.21 adults (19-60) per household. In all areas, the demographic data gathered was similar or very similar to the 2010 survey. This is suggestive that the findings that follow are comparable from a demographic perspective.

3.4 Household Income and Expenditures

This section addresses household income and expenditure. This is potentially one of the most complex and difficult parts of the survey, as reporting of income is sensitive and subject to mis-reporting. In general, the consultant's experience is that rural people tend to under-report income for concern that the information may get passed to other people.

3.4.1 Sources of Income

At the request of Land O'Lakes, the survey asked for the first three largest sources of income and briefly on any other sources, whereas the 2010 survey asked for the two largest sources only.

Table 18: Largest Source of Income, by Region

Q.3-01 What is your household's largest source of income?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Dairy farming	45	73.8%	106	76.3%	151	75.5%
Crop farming	9	14.8%	29	20.9%	38	19.0%
Self-employed	2	3.3%	2	1.4%	4	2.0%
Grocery/retail/trader	2	3.3%	2	1.4%	4	2.0%
Formal employment	2	3.3%	0	0.0%	2	1.0%
Other	1	1.6%	0	0.0%	1	0.5%
Livestock (not dairy) and fish farming	0	0.0%	0	0.0%	0	0.0%
Ganyu	0	0.0%	0	0.0%	0	0.0%
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

As expected, with a sample of dairy farmers, the most commonly reported largest source of income was dairy farming (75.5%) with little variation between regions. The second most common response was crop farming (19.0%) in both regions, of which the two most common crops were maize (5.0%) and tobacco (4.5%). Crops were a long way behind dairy, **suggesting that where dairy is present as a farming activity, it produces a higher income than other farming and non-farming activities in most cases**. **This finding is confirmation that dairy is a relatively good source of income for such households and better than the alternative sources in most cases**.

The overall proportion reporting dairy as the main income (75.5%) was substantially higher than in the 2010 AFS (60.5%). In Northern Region, the proportion of respondents relying on dairy as their main source of income was marginally higher at 73.8% in 2012 compared to 71.7% in 2010. The main difference occurs in Central Region, where 76.3% respondents reported dairy farming as their main source of income in 2012 compared to 56.8% of respondents in 2010. The explanation may be that the sample included (almost) only farmers with currently lactating cows, who invariably make at least some income from dairy, whereas the 2010 survey included farmers without cows, let alone lactating cows, hence income from dairy is less likely to be their primary source.

In terms of the herd make up in 2012, respondents (151) for whom dairy was their primary source of income had a total of 293 cows, equivalent to 1.94 cows per farmer, of which 78.5% were pures, 20.1% were high-crosses, 1.0% low-crosses and 0.3% were local. **This suggests a high quality herd.**

Table 19: Second Largest Source of Income, by Region

Q.3-04 What is your household's second largest source of income?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Crop farming	34	55.7%	96	69.1%	130	65.0%
Dairy farming	14	23.0%	26	18.7%	40	20.0%
Grocery/retail/trader/middleman	2	3.3%	4	2.9%	6	3.0%
Livestock (not dairy) and fish farming	2	3.3%	3	2.2%	5	2.5%
Other (pension, money from relative, etc)	0	0.0%	3	2.2%	3	1.5%
Formal employment	2	3.3%	0	0.0%	2	1.0%
Self-employed worker/tradesman	1	1.6%	1	0.7%	2	1.0%
Ganyu	0	0.0%	0	0.0%	0	0.0%
No secondary income	6	9.8%	6	4.3%	12	6.0%
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

For those with a second source of income (94.0%), crop farming was the most common source (65.0%). This was slightly more common in Central Region. Maize was again the most commonly reported crop (25.5%), followed by groundnuts (15.0%) and soybean (9.0%). The second most common response was dairy farming (20.0%); so, of the 24.6% dairy farmers who did not report dairy as their primary source of income, most of this group reported it as their secondary source. **Overall, 95.5% of the sample reported dairy to be their primary or secondary source of income.** This proportion is higher than found in 2010, when 68.3% of the sample reported dairy farming as their primary or secondary income (of which 7.8% reported it as secondary income). The main reason for the difference is likely to be that the 2010 AFS included farmers that did not have a dairy cow.

The herd make up belonging to respondents who reported dairy as their secondary source of income was similar in breed type to those for whom it was their primary income, only the cows per farmer was slightly lower. The group in total had 75 cows between 40 farmers, which is 1,87 per respondent. Of these 75 cows, 78.7% were pures, 20.0% were high-crosses and 1.3% were low-crosses.

In the original 2007 baseline, the proportion for dairy was the main source of income for 48% of farmers and crops was the main source for 44%. This balance appears to have decisively shifted. This is not necessarily due only to improvements in dairy, as it may be a function of worsening crop outcomes, but it is highly suggestive that dairy is more likely to be an important source of livelihoods for these households in 2012 compared to 2007. **Although not conclusive, the data suggest that dairy has become a more important source of income for sampled households over the life of the whole MDDA**.

As the proportion of the sample reporting dairy income as their primary source has increased, it is reasonable to make the inference that the amount of labor applied has increased and hence the overall level of dairy farming work. The effect on 'employment' is analyzed in section 3.8, but the above findings corroborate findings of greater employment in dairy at farm level.

Unlike the 2010 AFS, Land O'Lakes requested that a third income source be included in the 2012 study, as only capturing two sources of income (2010 AFS) would understate income.

Table 20: Third Largest Source of Income, by Region

Q.3-07 What is your household's third largest source of income?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Crop farming	11	18.0%	37	26.6%	**48**	**24.0%**
Self-employed worker/tradesman	1	1.6%	11	7.9%	**12**	**6.0%**
Other (pension, money from relative, etc)	6	9.8%	5	3.6%	**11**	**5.5%**
Livestock (not dairy) and fish farming	3	4.9%	4	2.9%	**7**	**3.5%**
Grocery/retail/trader/middleman	2	3.3%	5	3.6%	**7**	**3.5%**
Dairy farming	0	0.0%	4	2.9%	**4**	**2.0%**
Ganyu	1	1.6%	1	0.7%	**2**	**1.0%**
Formal employment	2	2.6%	0	0.0%	**0**	**0.0%**
No tertiary income	37	60.7%	72	51.8%	**109**	**54.5%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

Just under half the respondents (45.5%) reported a third source of income and of these (84.0%) had already given crop farming as a first or second response, suggesting that they have two or more cash crops. There was little variation between the two regions.

The frequency of crop farming mentions over the three sources of income, suggests that most dairy farmers engage in cash crop farming alongside their dairy enterprise.

Overall, 97.5% of the sample reported the dairy enterprise to be their primary, secondary or tertiary source of income. From the case studies, it was noted that farmers' investment in other business activities, such as trading and other crops, has been funded by dairy income. These findings highlight the dairy enterprise's centrality to household income.

3.4.2 Income

Improving dairy farmer's Income has been a key component in the MDDA from the outset. Measuring total household income from farmers, who receive much of their income from non-formal sources, is known to be difficult. Measuring income from the dairy enterprise is significantly easier as the majority of respondents sell their milk at a (relatively) fixed and consistent price to the MBG and this is recorded. However, the accuracy of the income data may be lower for farmers in Northern Region who have been selling a substantial proportion of their milk to vendors rather than the MBG due to the situation prevailing in the region (see later discussion).

Income was reported for the previous month (December)[4] and as an average monthly income. Considerable time was spent with the researchers and the Land O'Lakes M&E Specialist to ensure the concept of an average monthly income was accurately conveyed in the ChiChewa. This is important as many farmers have a mix of regular monthly income (e.g. dairy) and irregular crop income that comes in one or two amounts post harvesting. This approach was tested in the pilot, observed to be comprehensible to respondents and successful at eliciting the information sought.

This method does however have limitations, as discussed in section 2.2.5. Adopting this method partially affects the comparability of the data with the 2010 AFS, which asked respondents to give their minimum and maximum monthly incomes; then determined the means of the minimum and maximum; and then took the mid-point of these two values. The consultant's view is that the 2012 method was superior, as taking a mid-point fails to capture the frequency of good months and bad months by applying equal weightings to both minima and maxima. Asking for an average relies on the respondent to perform this calculation. The methods would still be expected to produce broadly comparable results. To allow comparisons, the consultant calculated the 2012 data at the aggregate level using the same method as in 2010.

For the 2012 study, the consultant anticipated that many respondents would be engaged in some form of crop farming or other activity that provides income seasonally or annually. This would result in them being unable to give an accurate monthly income figure for such sources of income. To overcome this challenge, the consultant built in a question to the instrument that recorded annual income that was averaged for use in both the previous month's income and 'averaged'[5] monthly income.

Data on dairy and total incomes from the 2012 survey are analyzed below:

[4] Compared to September/October in the 2010 AFS, which are likely to be higher income months than December which was the timing for the 2012 survey.

[5] This is the calculated average for the year accounting for seasonal income, particularly for crops – see methodology. It is referred to as 'averaged' to distinguish it from references to 'average(s)', with which it could be confused.

Table 21: Mean and Range of Monthly Income Levels (All sources) - Total

Q.3-02/3 Income Levels (All Sources) – Total	N	Minimum	Maximum	Mean	Std. Dev.
		MK			
Largest source: Last Month	196[6]	0[7]	70,000	15,249	12,679
Largest source: Averaged	196	416	52,000	17,428	11,059
Second Largest source: Last Month	186	0	41,667	6,489	7,650
Second Largest source: Averaged	186	208	41,667	6,944	7,729
Third Largest source: Last Month	91	0	30,000	6,837	8,133
Third Largest source: Averaged	91	167	25,000	6,432	6,379

Table 22: Mean and Range of Monthly Income Levels (All sources) – Northern Region

Q.3-02/3 Income Levels (All Sources) - Northern Region	N	Minimum	Maximum	Mean	Std. Dev.
		MK			
Largest source: Last Month	58	0	42,000	10,781	8,820
Largest source: Averaged	58	2,083	35,000	12,453	7,056
Second Largest source: Last Month	55	0	41,667	6,332	8,390
Second Largest source: Averaged	55	208	41,667	6,618	8,478
Third Largest source: Last Month	24	0	28,000	4,402	6,224
Third Largest source: Averaged	24	167	15,000	4,531	4,109

Table 23: Mean and Range of Monthly Income Levels (All sources) – Central Region

Q.3-02/3 Income Levels (All Sources) - Central Region	N	Minimum	Maximum	Mean	Std. Dev.
		MK			
Largest source: Last Month	138	0	70,000	17,128	13,581
Largest source: Averaged	138	416	52,000	19,519	11,768
Second Largest source: Last Month	131	0	35,000	6,555	7,351
Second Largest source: Averaged	131	333	35,000	7,081	7,423
Third Largest source: Last Month	67	0	30,000	7,710	8,589
Third Largest source: Averaged	67	333	25,000	7,113	6,915

Source: Consultant Survey, n=as shown

Averaged monthly incomes were consistently higher than for 'last' month, reflecting that in December (the 'last' month), there would be fewer crop sales opportunities. As a result, the focus of the analysis from this point on is on the averaged monthly income data.

The averaged primary (largest) monthly income for the whole sample was MK 17,428 (US $106). Averaged monthly income in Central Region (MK 19,519) is much higher than in Northern Region (MK 12,453).

Averaged secondary monthly incomes were generally less than half the amount of primary incomes, at MK 6,944 (US $42) per month. Secondary incomes were only slightly higher in Central Region compared to Northern Region.

Less than half the sample (n=91) reported a third source of income. Of those that did, the amounts from the third source were almost as large as those from secondary source, with the tertiary averaged monthly income at MK 6,432 (US $39). Tertiary incomes were much higher in Central Region (MK 7,133) than Northern Region (MK 4,531), though the sample is small at this level.[8]

[6] One case was excluded due to an income of MK 350,000 that distorts the analysis. The original analysis with the outlier included is available (Excel file). Three others refused to give income data.

[7] By December, many cash crops would already have been sold, hence a zero.

[8] This was due to respondents with generally smaller incomes having only primary or secondary sources, leaving only generally high earners reporting a third source of income.

The income figures were then filtered to include only incomes from dairy, whether this was as a primary, secondary or tertiary source. The results are tabulated below:

Table 24: Mean and Range of Monthly Income Levels (Dairy) – Total

Q.3-02/3 Income Levels (Dairy) – Total	N	Minimum	Maximum	Mean	Std. Dev.
		MK			
Largest source: Last Month	149	0	65,000	16,335	12,559
Largest source: Averaged	149	3,000	52,000	19,111	10,647
Second Largest source: Last Month	40	0	35,000	10,909	8,808
Second Largest source: Averaged	40	700	35,000	12,620	8,169
Third Largest source: Last Month	4	13,000	23,000	17,750	4,573
Third Largest source: Averaged	4	12,000	23,000	17,000	4,546

Table 25: Mean and Range of Monthly Income Levels (Dairy) – Northern Region

Q.3-02/3 Income Levels (Dairy) - Northern Region	N	Minimum	Maximum	Mean	Std. Dev.
		MK			
Largest source: Last Month	43	0	42,000	11,163	9,029
Largest source: Averaged	43	3,000	35,000	13,267	7,135
Second Largest source: Last Month	14	0	25,000	7,461	6,809
Second Largest source: Averaged	14	700	20,000	8,966	5,965
Third Largest source: Last Month	0	0	0	0	0
Third Largest source: Averaged	0	0	0	0	0

Table 26: Mean and Range of Monthly Income Levels (Dairy) – Central Region

Q.3-02/3 Income Levels (Dairy) - Central Region	N	Minimum	Maximum	Mean	Std. Dev.
		MK			
Largest source: Last Month	106	0	65,000	18,433	13,202
Largest source: Averaged	106	4,000	52,000	21,481	10,944
Second Largest source: Last Month	26	0	35,000	12,765	9,310
Second Largest source: Averaged	26	833	35,000	14,588	8,609
Third Largest source: Last Month	4	13,000	23,000	17,750	4,573
Third Largest source: Averaged	4	12,000	23,000	17,000	4,546

Source: Consultant Survey, n=as shown

Individual dairy incomes ranged widely both overall and within each region. This can be attributed to the lactation cycle, the number of cows owned, the health and productivity of each cow, or other reasons, such as including farmer reporting errors and estimations.

The averaged monthly income for respondents for whom dairy farming was their primary income was MK 19,111 (US $116). This is MK 1,683 (US $10) (9.7%) higher than the averaged primary income, when all sources are considered. The mean averaged monthly income of respondents whose primary income came from a non-dairy source was MK 12,094 (US $73). So when considering only the primary source of income, dairy averaged monthly incomes were in fact 58.0% higher than non-dairy incomes.

Table 27: Mean and Range of Monthly Income, Largest Income Only (Non-Dairy)

Q3-02/3 Income Levels (All Non-Dairy Sources) - Total	N	Minimum	Maximum	Mean	Std. Dev.
		MK			
Largest source: Average	47	416	50,000	12,094	10,746

Source: Consultant Survey, n=47

Comparing the two regions reveals a significant contrast; the averaged primary dairy monthly income in Central Region was MK 21,481 (US $130) compared to MK 13,367 (US

$81) in Northern Region, which is a difference of 60.7%. As discussed in the limitations section, Northern Region respondents may have under reported their income due to increased sales to vendors, however the size of the difference recorded in the sample suggests that under reporting would not account for it in full.

The 2010 AFS observed a similar pattern; it found primary income from dairy in Central Region (MK 16,911, US $113)[9] to be 45.1% higher than Northern Region (MK 11,653, US $78). **This suggests that while primary dairy incomes may have increased in both regions, the difference is also growing, with Central Region growing fastest.** Land O'Lakes focused its efforts in the extension period in Central Region.

Overall, mean primary dairy monthly incomes in this sample have increased to MK 19,111 (US $116) from a closely comparable figure of MK 15,362 (US $102) in 2010, a rise of 24.4% in MK value (13.7% in US $ terms) in the period. This is a substantial improvement in a key outcome of MDDA and attests to program effectiveness.

Another interesting finding is that 40 farmers (20%) stated dairy income to be their secondary source of income. Inevitably, these produced lower mean values for dairy income of MK 12,630 (US $77) per month. Furthermore, the average income from dairy as a secondary source is much higher in this sample than the average secondary income from all sources (MK 12,630 (US $77) compared to MK 6,944 (US $42)). The regional splits cannot usefully be analyzed given the low N numbers.

When dairy income data for main and secondary is combined and weighted,[10] the averaged monthly dairy income is MK 17,737 (US $107). The same measure calculated using the same method in the 2010 study was 15,115 (US $101).[11] While it is necessary to be mindful of the sampling differences, **the finding is that dairy income has increased from MK 15,115 per month in 2010 to MK 17,737 per month, an increase of 17.3% in MK.**

In the same way, the weighted averaged primary and secondary monthly income from all sources was calculated to be MK 12,323 (US $75) compared to MK 17,737 (US $107) for dairy. **Therefore, averaged monthly primary and secondary dairy incomes were 43.9% higher than averaged monthly primary and secondary incomes from all sources**.[12]

In evaluations prior to the 2010 survey, income from all sources was considered, compared to only two sources in 2010 – this resulted in understating of income in 2010. In order to make the 2012 study comparable with the earlier studies, a question for all other sources beyond the three most important sources was asked to capture all household income.

Table 28: Mean Monthly Income, All Other Sources of Income, by Region[13]

Q.3-10 Any other sources of income not mentioned	Northern Region			Central Region			Total		
	MK			MK			MK		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Amount	17	3,259	1,993	44	4,616	6,285	61	4,238	5,454

Source: Consultant Survey, n=61

For comparability, the same method was used to calculate aggregate income in the 2012 evaluation as in 2010. In this method, the main and secondary incomes for each household

[9] For 2010 US Dollar conversions, the rate ruling at the time of the survey was used ($1:MK 150).
[10] Calculated by multiplying: primary income mean x N_1 + secondary income mean x N_2, divided by (N_1 + N_2)
[11] Third sources of income were collected in the 2012 study. Only four respondents stated dairy as their tertiary income so combining all three sources and weighting gives a very similar result (MK 17,726) to when just the first two sources are combined.
[12] Adding tertiary incomes gives a weighted mean average of MK 11,190 (US $68) for all sources. However, this cannot be compared to the corresponding figure for dairy incomes due to the low N number for tertiary dairy incomes.
[13] The N numbers are low, but these figures are needed for the weighted averages in the analysis.

are added and then the mean is taken of all those incomes. Not all households reported a second income (n=186/196), so in cases where there was no secondary income, their combined income is equal to their primary income alone. As a result, across the sample, primary and secondary averaged income (from all sources) was MK 23,904 (US $145) per month. On an annualized basis, this equates to MK 286,848 (US $1,738) per year.

For comparability with pre-2010 studies, which included all sources of income, tertiary sources and 'any other sources of income not mentioned' were added in. The combined averaged income from all sources was MK 27,695 (US $168) per month, which equates to MK 332,340 (US $2,014) per year. These findings are summarized in the table below.

Table 29: Mean Averaged Annual Income and Share of Dairy Income 2007-12 (MK)

Mean Averaged Annual	Income all sources (MK)	Dairy income (MK)**	Dairy as % of income
Baseline[14]	190,743	127,707	67.0%
2008 AFS	236,590	105,567	44.6%
2009 AFS	412,589	171,340	41.5%
2010 AFS*	229,809	181,380	78.9%
2012 Survey (1st & 2nd largest sources)	286,848	212,844	74.1%
2012 Survey (1st, 2nd & 3rd largest sources)	321,276	212,712	66.0%
2012 Survey (1st, 2nd , 3rd & any other income)	**332,340**	**212,712*** **	**63.9%**

* Income from the 2010 AFS is from primary and secondary sources only
** The dairy incomes shown here are the annualized monthly figures given in the previous section
*** 'Any other income' cannot by definition be added into dairy income

Table 30: Mean Averaged Annual Income and Share of Dairy Income 2007-12 ($)

Mean Averaged Annual	Income all sources (US $)*	Dairy income (US $)	Dairy as % of income	Exch Rate MK:$1
Baseline	1,362	912	67.0%	140
2008 AFS	1,690	754	44.6%	140
2009 AFS	2,947	1,224	41.5%	140
2010 AFS	1,532	1,209	78.9%	150
2012 Survey (1st & 2nd largest sources)	1,738	1,290	74.2%	165
2012 Survey (1st, 2nd & 3rd largest sources)	1,947	1,289	66.2%	165
2012 Survey (1st, 2nd, 3rd & any other income)	**2,014**	**1,289**	**64.0%**	**165**

Source: Consultant Survey 2012, AFS 2010, 2008 & 2009 and baseline

The above analysis shows that **over the life of the MDDA, mean averaged annualized income from all sources increased from MK 190,743 (US $1,362) at the baseline to MK 332,340 (US $2,014) by 2012. This is an increase of 74.0% in MK terms and 47.8% in US Dollar terms over the life of the MDDA.**

Although income from all sources shows substantial increases, the degree of attribution to the MDDA is difficult to determine, though it is indicative of a positive impact. However, attribution is clearer in for dairy incomes. **Mean averaged annualized dairy income has increased from MK 127,707 at baseline to MK 212,712 by 2012. This is an increase of 66.6% in MK terms and 41.3% in US Dollar terms over the life of the MDDA.**

It would be reasonable to assume that the increase in dairy income has contributed substantially to the increase in income from all sources, since it is a large (64.0-67.0%) proportion of overall income. The proportion of dairy has declined slightly, but not significantly (within sample error range). This may also be due to investment of dairy

[14] Conducted in early 2008

proceeds into crop farming and other income activities, as well as a relatively low increase in increase in milk prices in 2011 (below inflation).

In conclusion, the MDDA does appear to have had a substantial impact on overall incomes, through the increase in dairy income of 66.6% in MK terms and 41.3% in US Dollar terms, over the life of the MDDA.

3.4.3 Expenditure

Household expenditure is related to household income and needs. There are periods when expenditure can exceed income (met out of savings or borrowing) and vice versa when income exceeds expenditure (savings can be made and loans repaid). In poor households, expenditure is a useful proxy to get insight into income, as borrowing opportunities are limited due to financial exclusion and the demands on the household mean that little income is saved. As a result, expenditure can be approximated to income at least in the short term.

However, as identified later, 68.0% of respondents reported accessing a bank account (savings) through their MBG, 42.0% reported joining a VS&L, 6.5% reported accessing a bank loan and 5.5% reported accessing loans directly from through the MBG. Comparing this with data from FinScope Malawi 2008, a nationally representative survey of financial access, just 19% of the population were formally banked, 0.8% had borrowed from a ROSCA or other community based lending group (similar to VS&L) and only 1% had accessed a bank loan. **These results suggest that financial access in MDDA households is well above the national average.**

Respondents may be more honest about expenditure than income, so reported expenditure data is often more reliable than reported income data. However, similar limitations exist on collecting expenditure data as exist on collecting income data as discussed in section 2.2.5.

Table 31: Household Mean Monthly Expenditure, by Region

Q.3-12 How much money do you spend a month on …?	Northern	Central	Total	Share of Total
	MK	MK	MK	%
Livestock inputs (drugs, feed etc)	6,978	7,753	7,516	18.8%
Crop inputs (fertilizer, pesticides)	4,723	7,593	6,718	16.8%
Groceries	4,285	5,598	5,197	13.0%
Education/ School	3,711	4,508	4,265	10.7%
Ganyu	2,848	2,596	2,673	6.7%
Household items (pots, plates & clothes)	2,810	2,477	2,579	6.4%
Transport	1,917	1,895	1,902	4.8%
Business expenses	169	2,451	1,755	4.4%
Maize	2,237	1,339	1,613	4.0%
Airtime	1,439	1,561	1,524	3.8%
Health/ Medical	1,607	1,479	1,518	3.8%
Fuel for cooking and lighting	583	1,275	1,064	2.7%
Loan payment	352	622	540	1.3%
Other expenses	89	612	452	1.1%
Equipment hire	25	551	391	1.0%
Other farming expenses	98	249	203	0.5%
Land and house rents	0	171	119	0.3%
Total	**33,870**	**42,730**	**40,027**	**100.0%**

Source: Consultant Survey, n=200[15]

[15] This table includes all 200 respondents, including the three respondents who did not respond and the one high income respondent who was excluded.

The main observation is that reported monthly expenditures are 44.5% higher than monthly income from all sources combined (MK 27,695). In the 2010 AFS, the overall average monthly expenses were MK 22,176, which was 15.8% higher than income.[16]. Other AFS also found large gaps between income and expenditure, for example the 2008 AFS reported an average monthly expenditure of MK 45,147 (US $300), which is more than double the average monthly income in that survey. The consultant's analysis in the 2010 evaluation suggested that the 2008 expenditure was probably substantially overstated. Expenditure in Central Region was 26.1% higher than in Northern Region. This is consistent with higher income levels in Central Region.

The methodology used in the 2010 and 2012 survey was similar for income and expenditure except that tertiary and other sources of income were not included in 2010. One methodological difference is that in 2010, the average was a midpoint as discussed earlier in the income section, whereas in 2012 it is a mean. This could have impacts in both directions, with some responses lower in one and higher in the other method. Overall, the consultant's view is that it probably resulted in understating income in 2010.

Looking in detail at the categories of expenditure, there have been major changes in several large expenditure items. An important one is the cost of livestock expenses. In 2010, these were at MK 2,840, but had risen by 264.6% to MK 7,516 in the 2012 survey. Similarly, crop inputs have risen by 187.8% from MK 3,577 to MK 6,718. There may have been higher cost inflation in farm and dairy inputs, but in the consultant's view, these are **more likely to be evidence of investment in crop and dairy**. .

The most significant expenditures are livestock inputs (18.8%), food (groceries and maize) (17.0%), crop inputs (16.8%) and education (10.7%), with ganyu and household items next on the list. This suggests a relatively diverse expenditure pattern, compared to very poor households that would have food as a much more significant item, and not be spending on items such as education, and investments in farming via inputs and ganyu.

Table 32: Household Expenses (Mean), by Region – Adjusted (N=196)

Adjusted Measure (non income reporters and very large income outlier excluded)	N	Minimum MK	Maximum MK	Mean MK	Std. Dev.
Livestock inputs (drugs, feed etc)	196	167	95,000	7,616	8,205
Crop inputs (fertilizer, pesticides)	196	0	140,000	6,601	14,358
Groceries	196	200	60,000	5,123	6,216
Education/ School	196	0	105,000	4,209	11,713
Ganyu	196	0	30,000	2,700	3,733
Household items (pots, plates and clothes)	196	0	80,000	2,419	7,272
Transport	196	0	30,000	1,820	2,857
Business expenses	196	0	276,000	1,781	19,781
Maize	196	0	18,000	1,634	2,746
Health/ Medical	196	0	15,000	1,482	1,885
Airtime	196	0	30,000	1,294	2,780
Fuel for cooking and lighting	196	0	14,000	1,074	1,633
Loan payment	196	0	10,000	541	1,613
Other expenses	196	0	35,000	461	2,671
Equipment hire	196	0	10,000	399	1,137
Other farming expenses	196	0	17,500	207	1,346
Land and house rents	196	0	12,000	121	904
Total	**196**	**N/a**	**N/a**	**39,482**	**N/a**

Source: Consultant Survey, n=196

[16] Note that income only covered two primary sources and was therefore known to be understated.

Given the inconsistent expenditure and income data, household expenditures were recalculated to exclude the expenses of the three respondents who did not report their average monthly income and of the respondent who reported an anomalous income. This reduced the total mean average household expenditures by MK 545 (US $3.3).

Comparing this data with the 2010 AFS reveals that household expenses in this sample were MK 17,306 (US $105) higher than in 2010, which equates to a 78.0% increase. Many of the expenses had a very high standard deviation (Std. Dev.), in some cases around twice the mean, which points to high variability of responses.

Interestingly, expenditure on education has risen from MK 2,066 to MK 4,265. This may be a function of differences in the sample and rising school costs or it may reflect increasing investment. From the case studies and other work with smallholder farmers, education is a high priority for a family and one of the key uses of increased dairy income is education. **The data is indicative, but not proof, of increased investment in education,** as education inflation is unlikely to have been of this magnitude.

3.4.4 Household Expenditure Decision Making

This section considers expenditure decision making for dairy enterprises and other sources. As noted in the methodology, this is one area where the relatively high proportion of men in the sample could distort the responses.

Table 33: Expenditure Decisions on Dairy Income, by Region

Q.3-11a Who decides how to spend the income from dairy?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Husband and wife together	25	42.4%	87	64.0%	**112**	**57.4%**
Wife alone	22	37.3%	16	11.8%	**38**	**19.5%**
Husband only	8	13.6%	29	21.3%	**37**	**19.0%**
No response	2	6.8%	0	2.2%	**2**	**3.6%**
Other family member	2	3.4%	4	2.9%	**6**	**3.1%**
Total	**59**	**100.0%**	**136**	**100.0%**	**195**	**100.0%**

Table 34: Expenditure Decisions on All Other Income Sources, by Region

Q.3-11a Who decides how to spend the income from other sources?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Husband and wife together	26	44.1%	95	69.9%	**121**	**62.1%**
Husband only	10	16.9%	25	18.4%	**35**	**17.9%**
Wife alone	20	33.9%	12	8.8%	**32**	**16.4%**
Other family member	2	3.4%	6	4.4%	**8**	**4.1%**
No response	3	5.1%	1	0.7%	**4**	**2.1%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

For dairy incomes, the majority of respondents reported that spending decision are made by husband and wife together (57.4%). Spending decision were restricted to husbands alone in 19.0% of cases, of which the majority were in Central Region. As in 2010, wives alone were reported to make spending decisions in 19.5% of cases, being much more common in Northern Region (37.3%) than Central Region (11.8%). These two findings may be partly due to the higher proportion of male respondents in Central Region sample (60.4%) and the higher proportion of females in the Northern Region sample (55.7%). It is also partly due to a higher proportion of widows in Northern (14.8%) than Central Region (4.3%).

The pattern for income from all other sources was very similar.

The 2010 AFS found joint decision between husband and wife in 84.0% of cases for all sources. This is considerably higher than the same figure for dairy or other income expenditure. The reason is unclear and attributed to sampling variation, as it is unlikely that this would have become less common. It is also important to recognize that male and female respondents would potentially respond differently, so any findings have to be taken with caution. Ideally, results should be disaggregated by sex, but the sample for women only households was too small to provide a meaningful comparison with.

3.4.5 Assets bought with Dairy Income

This section looks at assets bought with dairy income. Since income is fungible, it is difficult to attribute additional spending specifically to dairy, but the data indicate the ability of these households to invest in assets.

Table 35: Assets Bought with Dairy Income, by Region

Q4-06. What assets/things have you bought using money from your dairy farming?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Bricks for a house	16	26.2%	40	28.8%	56	28.0%
Iron sheets	13	21.3%	41	29.5%	54	27.0%
Other livestock (e.g. chickens)	0	0.0%	48	34.5%	48	24.0%
Spent on education	17	27.9%	29	20.9%	46	23.0%
Bicycle	10	16.4%	33	23.7%	43	21.5%
Other materials for a building	10	16.4%	24	17.3%	34	17.0%
Furniture	11	18.0%	14	10.1%	25	12.5%
Stock of food (e.g. maize)	7	11.5%	16	11.5%	23	11.5%
Ox-cart	0	0.0%	17	12.2%	17	8.5%
Radio	6	9.8%	9	6.5%	15	7.5%
Not yet spent (increased savings)	4	6.6%	7	5.0%	11	5.5%
Cellphone/s	2	3.3%	4	2.9%	6	3.0%
Land	0	0.0%	5	3.6%	5	2.5%
Motorcycle or other vehicle	0	0.0%	4	2.9%	4	2.0%
More dairy animals	0	0.0%	3	2.2%	3	1.5%
Other	31	50.8%	51	36.7%	82	41.0%
No response	4	6.6%	12	8.6%	16	8.0%

Source: Consultant Survey, n=200 farmers, Multiple response - % as of n=200

The most common assets bought by Central Region respondents were other livestock (34.5%), iron sheets (29.5%), bricks for a house (28.8%), bicycle (23.7%) and education (20.9%). The most common responses in Northern Region were education (27.9%), bricks for a house (26.2%) and iron sheets (21.3%). It is interesting to note that no Northern respondents bought other livestock with dairy income, while this was the most popular response in Central Region. This may be due to the cultural importance of cow ownership in Northern Region, so if any further livestock bought would be a cow.

As observed in 2010, there were certain cultural regional variations, such as a higher proportion of ox-carts bought in Central Region (a common form of transport in Central), particularly south of Lilongwe. However, there was a similar pattern in both years and across both regions on most assets, particularly housing materials. Bricks, iron sheets and other building materials (17.0%) are an indication that a household has moved up the income scale and out of poverty from traditional grass roofed mud/wattle houses. This is a positive indicator of increased wealth for many of the dairy farming households.

41.0% of the sample reported buying some 'other' asset not listed in the questionnaire. Not all of these are strictly assets with a long life (beyond one year). These are analyzed below:

Table 36: (Other) Assets Bought with Dairy Income, by Region

Q. 4-06 What assets/things have you bought using money from your dairy farming?(OTHER)?	Total	
	#	%
Bought fertilizer	43	21.5%
Bought Clothes	21	10.5%
Solar Panels	9	4.5%
TV	8	4.0%

Source: Consultant Survey, n=81

A large proportion of the sample (21.5%) reported buying fertilizer with dairy incomes. This is consistent with the finding that the majority of dairy farmers also engage in some form of crop farming and probably that dairy income enables them to invest in their food and cash crops.

The purchase of consumption items like clothes and items like solar panels and TVs, suggests the households have surplus income over cash.

As observed in 2010 and studies, households have purchased a range of farming, housing, household, transport and luxury assets, suggesting that they have had surplus income over day to day 'consumption' spending. This is also indicative that they have understated their incomes.

3.5 Dairy Enterprise

This section looks at dairy herd acquisition and production, as well as current yield figures.

Table 37: Farmers with at least One Lactating Cow, by Region

Q.4.00 Number of farmers with at least one cow lactating now	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Have at least one lactating cow	52	85.2%	131	94.2%	**183**	**91.5%**
Do not have at least one lactating cow	9	14.8%	8	5.8%	**17**	**8.5%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

Nearly all farmers (91.5%) had at least one cow lactating at the time of survey, with fewer in Northern (85.2%) than Central Region (94.2%). Overall 6.5% of respondents had more than one cow lactating at the time of survey. However, these results are biased, as the sample was of farmers who came to the MBG and thus (mostly) had milk to deliver. This bias is an important difference, so these figures should not be compared to the 2010 AFS.

Table 38: Average Daily Liters of Milk Production per Lactating Cow, by Region

Q.4-00a.i. How much did each produce yesterday?	Northern Region			Central Region			Total		
	Liters			Liters			Liters		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Cow 1	51	9.01	5.37	131	11.58	6.10	182	10.86	6.01
Cow 2	2	10.50	6.36	11	9.64	5.24	13	9.77	5.13
Cow 3	1	15.00	N/a	3	6.00	3.61	4	8.25	5.38
Other cows	1	10.00	N/a	1	5.00	N/a	2	7.50	3.54

Source: Consultant Survey, n=183 farmers[17]

[17] N=183 farmers as 183/200 had lactating cows at that point and so were able to answer subsequent questions, for cow 1, one respondent refused to answer.

To calculate the mean daily liters produced by all lactating cows in the sample, the total amount of milk produced in the previous day by all cows (2,151.6 Ltrs) was divided by the total number of lactating cows (201). **The mean milk production for the prior day of all lactating cows was 10.70 Ltrs. Central Region recorded a higher mean (11.27 Ltrs) than Northern Region (9.19 Ltrs).**

Central Region had a higher proportion of pure animals (84.0% compared to 68.1%) and it is also the region where Land O'Lakes has been investing more of its efforts, such as with incentivizing CAHNW and Private Extension Service Providers (PESPs). Expenditure on livestock inputs was also noted to be higher.

If yesterday's production is used as the average day's production, the mean monthly yield for the sample is calculated at 331.7 Ltrs. This is within 10% of the mean reported for 'last month's production' (365.2 Ltrs) in section 3.6 below, validating both findings.

Table 39: Average Daily Milk Production per Lactating Cow, by Breed

Q.4-00a.i. How much did each produce yesterday	Pure			7/8ths or 6/8th		
	Liters			Liters		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Cow 1	158	11.17	6.23	24	8.83	3.70
Cow 2	8	10.88	5.67	5	8.00	4.06
Cow 3	2	6.50	4.95	2	10.00	7.07
Other cows	0	N/a	N/a	5	7.50	3.54

Source: Consultant Survey, n=183 farmers

Using the same method as above the mean daily milk production of lactating pures was 11.10 Ltrs compared to 8.59 Ltrs for high-crosses.

Table 40: Mean Lactation Period (Months), by Region

Q.4-00a.ii. How long has it been lactating (months)	Northern Region			Central Region			Total		
	Months			Months			Months		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Cow 1	51	6.57	3.25	130	6.12	3.23	181	6.25	3.23
Cow 2	2	11.50	4.95	10	5.85	4.32	12	6.79	4.73
Cow 3	1	7.00	N/a	3	8.33	4.62	4	8.00	3.83
Other cows	1	7.00	N/a	1	10.00	N/a	2	8.50	2.12

Source: Consultant Survey, n=183 farmers

Using the same method, the typical cow in the sample was calculated to have been lactating for 6.34 months at the point of the survey. The lactation period was slightly longer (by 0.60 months) in Northern Region, which is not significant.

Table 41: Source of Dairy Cows, by Region

Q.4-01a. How did you get your cow(s) for the dairy enterprise?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
From Land O'Lakes program	45	73.8%	111	79.9%	156	78.0%
Bought with own money	7	11.5%	21	15.1%	28	14.0%
From another organization	8	13.1%	13	9.4%	21	10.5%
Other source	2	3.3%	0	0.0%	2	1.0%
Inherited the cow(s)	0	0.0%	1	0.7%	1	0.5%

Source: Consultant Survey, n=200, Multiple Response - % as of n=200

The majority (78.0%) of respondents received their cows from Land O'Lakes with little variation between regions. This exceeds the 2010 findings, which reported 62.0% from Land O'Lakes in total. Again this difference could be attributed to the 2012 sample

including only farmers with lactating cows, which are more likely to be of the pure or high-cross variety that Land O'Lakes distributes. It also partly reflects the distribution of pure-breed cows in the MDDA extension period at those MBGs that were surveyed.

The second most common response was that farmers bought the cow with their own money (14.0%). 10.5% reported receiving cows from another organization. Note that some farmers received cows from multiple sources and so the total percentage exceeds 100%.

Table 42: Sources of Dairy Cows (Other Organizations), by Region

Q.4-01a. How did you get your cow(s) for the dairy enterprise? (Other Organization)	Total	
	#	%
SSLPP	6	3.3%
MDFA	5	2.8%
World Vision	4	2.2%
EU	2	1.1%
CREMPA	1	0.6%
Does not know the organization	1	0.6%
MASAF	1	0.6%

Source: Consultant Survey, n=20 – percentage as of n=200

Table 43: Number of Cows Received from Pass-on Scheme, by Region

Q4-01b. Was this from a pass on scheme?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
From Land O'Lakes program	42	68.9%	90	64.7%	132	66.0%
From another organization	7	11.5%	10	7.2%	17	8.5%
Other source[18]	1	1.6%	0	0.0%	1	0.5%

Source: Consultant Survey, n=200, Multiple Response - % as of n=200

Overall 66.0% of the sample reported receiving a cow through the pass-on scheme. This proportion was higher in Northern Region. Similarly, the majority (81.0%) who received their cows from another organization also did so through a pass-on scheme, with the proportion slightly higher in Northern Region.

3.6 Milk Production and Usage

This section gathered data on milk production levels. This has been a key element of the MDDA, along with 'usage' i.e. what the farmers did with the milk the produced.

The lower N numbers in this question (as well as Q.4-00) reflect that only those respondents who currently had lactating cows were able to answer these questions. In some cases, respondents refused or were unable to give answers, which accounts for the inconsistency in the N numbers, particularly on sensitive issues such as sales to the MBG and others. It is noteworthy that **36 people in Central Region (27.4%) and 12 in Northern Region (23.1%) were not prepared to respond to the request to state milk sold to others**. It is noted that some MBG members are reluctant to discuss sales not to the MBG.

[18] One respondent who bought a cow with their own money and one who inherited a cow claimed they did so via a pass on scheme, suggested they did not understand the question. They were removed from the analysis.

Table 44: Previous Month's Mean Milk Production and Usage (Ltrs), by Region

Q4-02a Last month what was your volume of...?* Region	Northern Region				Central Region				Total			
	Liters				Liters				Liters			
	N	Mean	Std Dev	% total usage	N	Mean	Std Dev	% total usage	N	Mean	Std Dev	% total usage
1. Milk production	**51**	**292.5**	**266.0**	**N/a**	**130**	**393.6**	**229.6**	**N/a**	**181**	**365.2**	**243.9**	**N/a**
2. Milk consumption	52	42.6	28.7	13.5%	130	45.8	25.2	11.3%	182	44.9	26.2	11.8%
3. Milk sold to the MBG	50	193.9	152.5	61.5%	130	305.2	196.7	75.6%	180	274.3	191.7	72.2%
4. Milk sold to others	40	55.9	103.4	17.7%	95	16.0	31.1	4.0%	135	27.8	64.2	7.3%
5. Milk given to calf	51	12.4	52.0	3.9%	125	7.9	24.8	1.9%	176	9.2	34.8	2.4%
6. Milk wastage	52	10.4	15.9	3.3%	131	28.8	51.7	7.1%	183	23.6	45.3	6.2%
Total Usage (sum 2 -6)		**315.1**		**100.0%**		**403.6**		**100.0%**		**379.7**		**100.0%**

Source: Consultant Survey, n=as shown

As well as collecting last month's figures, averages for these six variables were collected and analyzed in detail below. Mean monthly milk production for the sample in December 2012 was 365 liters/farmer, which is within 10% of the monthly average calculated in Q.4-00.a.i. Consistent with the findings in Q.4-00.a.i, monthly production in Central Region was 34.4% higher (394 Ltrs) than in Northern Region (293 Ltrs). Totaling the means of all different forms milk usage reveals that respondents report 'using' slightly more milk than they produced in December, which is likely down to estimation errors.

From the 2010 AFS, the reported mean production for September 2010 was 273 liters/household/month, across all MBGs and all types of cows. **Comparing these two figures suggests milk production increased by 33.7% between the 2010 and 2012 sample.** This is consistent with other data from MBGs and processors on production levels recovering in 2011 over the low point in 2010.

The next section looks at the averaged monthly production and use, rather than for the last month, which has been analyzed above.

Table 45: Averaged Monthly Milk Production and Usage (Ltrs), by Region

Q. 4-02c. What is your average amount per month of …	Northern Region				Central Region				Total			
	Liters				Liters				Liters			
	N	Mean	Std. Dev.	% of total usage	N	Mean	Std. Dev.	% of total usage	N	Mean	Std. Dev.	% of total usage
1. Milk production	56	312.9	197.6	N/a	136	431.2	219.5	N/a	192	396.7	219.5	N/a
2. Milk consumption	57	45.5	25.9	15.1%	136	47.3	23.2	12.7%	193	46.8	24.0	13.1%
3. Milk sold to the MBG	56	178.7	141.8	59.4%	136	274.3	167.8	73.4%	192	249.5	171.4	70.0%
4. Milk sold to others	31	38.0	68.3	12.6%	63	15.3	35.5	4.1%	94	22.9	50.1	6.4%
5. Milk given to calf	56	25.7	46.1	8.5%	133	16.1	33.3	4.3%	189	19.0	37.7	5.3%
6. Milk wastage	56	13.1	13.9	4.3%	134	20.7	28.6	5.5%	190	18.5	25.3	5.2%
Total Usage (sum 2-6)		**300.9**		**100.0%**		**373.7**		**100.0%**		**356.6**		**100.0%**

Source: Consultant Survey, n=as shown

The averaged monthly milk production in the sample was 396.7 Ltrs and usage 357 Ltrs. Again, the mean production was considerably higher (38.1%) in Central Region (431 Ltrs) than in Northern Region (313 Ltrs).

The corresponding monthly average for production in 2010 was 312.6 Ltrs. **This an increase of 26.9% in production between 2010 and 2012.** This finding is broadly consistent with the findings for 'last months' production so can be seen as reliable. Furthermore, in this instance the figures are more closely comparable, since this question was only asked to farmers with at least one cow in 2010, as was the method of 2012.

However, this is tempered by the fact that not all cows in 2010 were lactating whereas most cows covered in the 2012 survey were.

Even allowing for these caveats, the increase milk production figures are indicative of a positive outcome of the MDDA program.

As with the 'previous month' figures, the average figures for 'Milk sold to others' appear unreliable. This is indicated by the very high no response rate (over half the valid sample) and the standard deviation being nearly double the mean in both regions. This further supports the supposition that MBG members were reluctant to discuss their sales outside the MBG and hence the figure for 'Milk sold to others' is likely to be under stated.

In terms of the breakdown of milk uses, selling to the MBG was by far the most popular use in both regions. The mean sales to the MBG were lower in Northern Region as expected with an offsetting higher mean for the amount sold to others in Northern Region (38.0 ltrs), compared to Central Region (15.3 ltrs).

Milk consumption has positive nutritional benefits; higher consumption would be another positive indirect outcome resulting from the intended increase in production. The averaged milk consumption per household in 2012 was 46.8 Ltrs/month, which equates to 1.56 Ltrs/day. The corresponding figure in 2010 was 36.5 Ltrs/month or 1.22 ltrs/day. As reported in section 3.3, household size has not changed from 2010, so it is reasonable to infer that individual milk consumption has increased within dairy farming households.

Table 46: Averaged Monthly Revenue for Milk Sold (MK), by Region

Q.4-02c. What is your average amount per month of ...	Northern Region			Central Region			Total		
	MK			MK			MK		
	N	Mean	Std Dev	N	Mean	Std Dev	N	Mean	Std Dev
3. Milk sold to the MBG (MK)	56	10,646	8,446	136	18,534	11,337	192	16,234	11,150
4. Milk sold to others (MK)	31	2,978	5,346	63	1,162	2,705	94	1,761	3,851

Source: Consultant Survey, n=as shown

The averaged monthly revenue for milk sold to the MBG was MK 16,234 (US $98). The mean revenue in Central Region was MK 7,888 (US $48) higher than in Northern Region, which is consistent with the finding that dairy incomes are much higher in Central Region.

The averaged revenue from milk sold to others was MK 1,761 (US $11), which was almost three times as large in Northern Region compared to Central Region. This is consistent with the finding that higher quantities are sold to others in Northern Region and that a slightly higher average price was received from vendors (see below). It is probably also an understatement of the true level.

The findings are consistent with reported dairy income figures in section 3.4.2. The combined total of averaged monthly revenue from MBGs and other buyers comes to MK 17,995 (US $ 109), compared to the MK 17,737 (US $ 107) calculated as the average monthly dairy income. This further validates the accuracy of the findings.

The averaged revenue figure arrived at appears to understate the amount that farmers are selling to vendors outside the MBG. Since this is very similar to the income reported from dairy in section 3.4.2, **it is reasonable to infer that the dairy income figures calculated by respondents may be excluding sales to vendors in many cases. This may explain the discrepancy between income and expenditure figures.**

Table 47: Last Month's Mean Milk Price per Ltr, by Region

Q4-02b Last month what was the price per Liter of...?	Northern Region			Central Region			Total		
	MK			MK			MK		
	N	Mean	Std Dev	N	Mean	Std Dev	N	Mean	Std Dev
3. Milk sold to the MBG	59	59.58	9.63	128	67.58	2.94	187	65.05	6.98
4. Milk sold to others	30	78.33	23.76	51	76.14	27.64	81	76.95	26.14

Source: Consultant Survey, n=as shown

The mean price received per Ltr from the MBG was MK 65.05 (US $0.39). The mean price received from other buyers was MK 76.95 (US $0.47), which is higher by MK 11.90 (US $0.07). However, the Std. Dev. reveals that the price received from other sources is much more variable than that received from the MBG. This is not surprising and is one of the risks of selling to vendors.

The price received from the MBGs in Central Region (MK 67.58 /US $ 0.41) was on average MK 8.00 (US $0.05) higher compared to Northern Region (MK 59.58 /US $0.36). The variation around the mean price was also lower in Central Region. However, the price received from other sources in Northern Region was MK 78.33 (US $0.47), which was slightly higher than in Central Region by MK 2.19 (US $0.01). In general, the findings are consistent with the prices reported in the MBG Committee interviews (see later).

In the 2010 AFS, nearly all farmers quoted the price received from the MBG in Northern Region as MK 55/Ltr, while for Central the mean price was MK 64.48/Ltr. Comparing the two studies shows the prices received from the MBGs have risen by roughly the same amount in both regions in absolute terms (and hence overall), at just under 5%.

This gives substance to comments about low milk prices, as these have not increased with the rate of inflation over the period (approximately 10%). On a more positive note, it indicates that increases in income have come from increases in production not from price inflation.

3.6.1 Dairy Enterprise Expenses

In order to determine the mean monthly amount spent on the dairy enterprise, respondents were asked how much they paid for a list of inputs in the previous month and on average over the year. Only the averaged monthly figures are reported, as the pattern of expenses are similar in both questions. The main difference was that the amounts for some items were larger in the averaged data than in the previous month's data. The reason for this is most likely that some items on the list are not bought on a regular monthly basis, so may not appear in the previous month's amounts. These would have been included in the averaged amounts as researchers were told to ask respondents for an annual or biannual figure for expenses that are not bought monthly and then the amount was divided to give a monthly average. The averaged data is therefore more likely to reflect actual costs.

This missing data is likely to have contributed to the discrepancy between mean total monthly dairy enterprise expenses calculated here (MK 15,978 (US $97) and the mean for 'Livestock inputs' recorded in the household expenses question (MK 7,516 (US $46)). This is because when estimating monthly costs for livestock inputs, the respondent is likely to report what they spend in an average month and hence not factor in the cost of one off, annual or other infrequent purchases. This data difference is not deemed by the consultant to be an issue as the method of calculation varies significantly.

Analysis of the total expenses in the dairy enterprise shows the mean total expenses for farmers in this sample comes to MK 15,978 (US $97). Expenses in Central Region (MK 17,091 (US $104) are 27.2% higher than Northern Region (MK 13,433 (US $81)). The high standard deviation observed is most likely due to farmers estimating these costs and may reflect that some farmers own more cows than others. It also reveals the presence of many outliers, such as under insemination costs. The corresponding figures in the 2010 survey

were far lower; the overall average dairy expenses were MK 8,740 (US $58) and again Central Region expenses were around a third higher than Northern Region expenses.

Table 48: Averaged Monthly Dairy Enterprise Expenses, by Region

Q4-03b. What is the average monthly cost you have had to pay for …	Northern Region		Central Region		Total	
	MK		MK		MK	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
1. Feeds (roughage) e.g. hay	73	408	181	664	148	598
2. Madeya	1,886	2,239	1,178	1,055	1,401	1,553
3. Mineral supplements	889	1,058	379	584	536	795
4. Salt	752	754	580	520	628	604
5. Crude protein supplements	2,093	3,163	5,987	4,464	4,783	4,476
6. De-wormer	338	510	343	384	339	426
7. Dip	745	978	723	579	728	724
8. Veterinary drugs	75	293	67	323	69	313
9. Kraal/Khola maintenance ***(not original construction)***	492	1,143	565	1,217	541	1,192
10. Labour ***(equivalent cost if not paid in money e.g. in food)***	908	1,631	1,247	1,778	1,204	1,901
11. Transport	1,432	2,052	787	1,296	985	1,595
12. Artificial insemination	1,034	992	1,159	2,100	1,367	3,950
13. Bull insemination	1,018	929	785	1,370	849	1,253
14. Molasses	29	131	82	584	66	491
15. Soap	224	289	289	273	271	279
17. Other dairy production costs not yet included	0	0	232	541	161	462
Total	**11,987**	**16,571**	**14,583**	**17,730**	**14,076**	**20,614**
	n=60		n=135		n=195	

Source: Consultant Survey, n=200

As mentioned earlier, production in Central Region was 38.1% higher. Relating this to the activities of the MDDA to promote animal feeds, which was confirmed by MBG Committees reporting higher sales, then this suggests that Central Region respondents may be getting a productivity gain from their additional spending/investment. Spending on crude protein supplements is 194% greater in Central Region, a considerably larger factor increase than for most other expenses. **This suggests that the amount of crude protein given to dairy cows has been increasing.**

Breaking down the costs, the largest cost was crude protein supplements with a mean spend of MK 4,834 (US $29). This expenditure was higher in Central Region, as were 11 of the other 16 expenses recorded. Other large costs overall and in both regions were madeya, artificial insemination and labor.

Linking dairy expenses to revenue is a very crude method for estimating dairy profit and considerable caution is needed for a number of reasons. Firstly, the average income is brought down by relatively low prices from the main processor in Northern Region. Secondly, the calculations above do not factor in any understated milk sales to vendors and even to neighbors; this would increase the true income considerably, especially in Northern. Thirdly, income from sales of bull calves and terminal value of the heifer are not included. Finally, around 15% of milk is either consumed by the family or used for feeding calves (saving cost). This milk is part of the costs, but does not contribute to the income.

With these considerable caveats, the mean net profit is calculated to be MK 3,919 (US $24) per month. Other findings, such as the high level of spending and statements in the next table suggest a more substantial outcome from dairying.

3.6.2 Dairy Enterprise Perceptions

The results in the following table are formatted in 'traffic light' colors for ease of viewing the general pattern of responses. **Relatively** low numbers become an increasingly darker shade of red the lower the number. **Relatively** high numbers become an increasingly darker shade of green the higher the number. Numbers which, relatively speaking, are somewhere around the mean are colored in buff/yellow, with a redder shade the lower they are and a greener shade the higher.

Table 49: Statements Regarding the Dairy Enterprise[19]

Q4-04: Statements	Correct			Not correct			N		
	North	Center	Total	North	Center	Total	North	Center	Total
My cow's milk yield is higher than last year	69.7%	62.8%	64.9%	30.3%	37.2%	35.1%	33	78	111
I sell more milk to the MBG than last year	69.7%	62.0%	64.3%	30.3%	38.0%	35.7%	33	79	112
I use more supplementary feeds and vitamins than last year	42.5%	61.1%	55.4%	57.5%	38.9%	44.6%	40	90	130
I produce more oil seed crops than last year	22.0%	36.0%	32.2%	78.0%	64.0%	67.8%	41	111	152
My income from dairy has increased compared to last year	66.7%	62.0%	63.4%	33.3%	38.0%	36.6%	33	79	112
I use more ganyu for dairy than last year	33.3%	35.9%	35.2%	66.7%	64.1%	64.8%	30	78	108
I got HIV/AIDS messages through my MBG	93.2%	96.4%	95.5%	6.8%	3.6%	4.5%	59	139	198
I have been trained in construction of my cow shed to avoid urine, dung and spray run off into the water supply	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	57	136	193

Source: Consultant Survey, n= as shown

The varying N numbers are attributed to many farmers not having lactating cows one year ago (44.0%), so were not able to respond. The results should be viewed in the light of this, i.e. the percentages reported are not of the whole sample of 200 but rather of the farmers willing and able to answer each statement, indicated by the numbers in the N column. Each statement is individually analyzed; the regional differences are minimal unless stated.

Milk yield was more commonly than not perceived by farmers in the sample to have increased in the past year (64.9% agreed vs. 31.5% who disagreed). This is consistent with the MBG records that showed 11/16 MBGs recorded higher values for 'milk brought to the MBG in 2011 compared to 2010. This is more so compared to five years ago when 24.5% agreed and only 8.0% disagreed. This corroborates findings from the MBG records which show 9/16 MBGs reported higher volumes for milk brought to the MBG compared to 2006. The percentages on milk sold to the MBG were almost exactly the same.

Central Region respondents (61.1%) were more likely to report using more ***supplementary feeds and vitamins*** than Northern Region respondents (42.5%). MBG Committee records tell a similar story (7/10 MBGs for Central Region and 4/7 MBGs for Northern Region). Another interesting finding is that the majority of Northern Region respondents reported not using more supplementary feeds and vitamins than five years ago.[20]

[19] The question was also asked to compare now with five years ago. These responses have been removed for easier reading but values included in the narrative where relevant.

[20] Except for two, Northern Region MBGs did not keep records on this in 2006.

A high proportion (67.8%) of respondents reported that they did not produce more ***oil seed*** crop than last year, compared to 32.2% who said they did. The pattern was very similar for production of oil seed crop five years ago.

63.4% of the sample perceived that their ***income from dairy*** had increased from last year, compared to 36.6% who said it had not. 72.3% said dairy income had increased from five years ago compared to 27.7% who said it had not.

The majority of respondents to this question said they do not use more ***ganyu*** than last year (64.8% do not, 35.2% who do). A similar pattern was observed for the amount of ganyu used five years ago. This is consistent with the finding that the *share* of household spending on ganyu has fallen. However though it may appear inconsistent with later findings on increased employment, this may suggest that dairy farmers have begun employing full time workers more commonly than using ganyu. It may also reflect a relative shortage of people willing to do ganyu following increased food security in recent years, and therefore less incentive to do casual work. This may have changed the pattern of employment to be from casual to part-time regular (see employment section 3.8)

Overwhelmingly, 95.5% of the sample said they received ***HIV/AIDS messages*** through their MBG and 100.0% reported: *"I have been trained in construction of my cow shed to avoid urine, dung and spray run off into the water supply."* These findings are supported by records from the MBG Committee interviews that show the numbers reached with such messages to be approximately equal to the membership numbers for each MBG.

Table 50: Problems Faced by MBG Members in Dairying, by Region

Q.4-05 What problems do you face in dairying?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Low prices	13	21.3%	62	44.6%	75	37.5%
Other	16	26.2%	50	36.0%	66	33.0%
Late payment by the MBG	7	11.5%	35	25.2%	42	21.0%
Animal health problem (death or illness)	13	21.3%	22	15.8%	35	17.5%
Lack of supplementary feeds	15	24.6%	18	12.9%	33	16.5%
Unable to get my cow pregnant	15	24.6%	15	10.8%	30	15.0%
High spoilage of milk and loss of income	5	8.2%	25	18.0%	30	15.0%
Lack of market	16	26.2%	10	7.2%	26	13.0%
Lack of vaccinations/drugs /treatments	9	14.8%	9	6.5%	18	9.0%
No major problems encountered	3	4.9%	8	5.8%	11	5.5%
Lack of extension services/help	4	6.6%	5	3.6%	9	4.5%
Low production	2	3.3%	5	3.6%	7	3.5%
High taxation	0	0.0%	2	1.4%	2	1.0%
High deductions by the MBG	0	0.0%	1	0.7%	1	0.5%
Lack of labor	1	1.6%	0	0.0%	1	0.5%
No response	2	3.3%	7	5.0%	9	4.5%

Source: Consultant Survey, n=200 farmers, Multiple response - % as of n=200

There is considerable variation in the reported problems farmers faced in dairying between the two regions. By far the most popular response in Central Region was low prices (44.0%), but in Northern Region this was only the 5th equal most common response. This is despite the finding from the MBG Committee survey that the price received was on average higher in Central Region (MK 67.6) than in Northern (MK 60.0). Based on other findings in the evaluation, the consultant takes the view that this may be due to getting higher prices for part of their milk from vendors, so the MBG price is less important. This was the

conclusion arrived at in the 2010 AFS, which also reported a relatively lower percentage (15.2%) of Northern Region respondents citing low prices as a problem than expected.

In **Northern Region**, the most common responses were lack of market (26.2%), lack of supplementary feeds and inability to get dairy cows pregnant (24.6%) and animal health problems (21.3%). While not overwhelming, these responses, suggest that AI services and marketing were problematic in Northern Region. The marketing problems in Northern are long standing and cannot be linked to limitations in the MDDA design or implementation. The second most popular response in Central Region was late payment by the MBG at 25.2% compared to 11.5% in the Northern Region. The top thee responses overall were low prices (37.5%), late payment by the MBG (21.0%) and animal health problem (death or illness) (17.5%). 33.0% of respondents gave an 'other' response, which is analyzed below.

Table 51: (Other) Problems Faced by MBG Members in Dairying

Q.4-05 What problems do you face in dairying (OTHER)? – (Seven most common responses)	Total	
	#	%
Feed is expensive	19	9.5%
Late payments (non MBG)	12	6.0%
Breakdown of cooling engine	6	3.0%
Lack of MBG leadership	5	2.5%
Khola maintenance	5	2.5%
Cow breaking the khola	2	1.0%
ESCOM black outs	2	1.0%

Source: Consultant Survey, n=51/66 farmers reporting 'other', Multiple response - % as of n=200

The two 'other' responses that were frequently mentioned were feed is expensive (9.5%) and late payment by non-MBG buyers (6.0%).

3.7 Milk Bulking Groups

Two sections in the farmer questionnaire gathered information about the MBG, the services offered to farmers and related issues. These were triangulated with views from the MBG Committee members. The dates of farmers joining the MBGs is set out in the table below:

Table 52: Year of Membership, by Region

Q.5-01 In what year did you become a member of the MBG?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
1960 to 1980	0	0.0%	2	1.4%	**2**	**1.0%**
1981 to 1990	5	8.2%	3	2.2%	**8**	**4.0%**
1991 to 2000	7	11.5%	18	12.9%	**25**	**12.5%**
2001 to 2005	23	37.7%	48	34.5%	**71**	**35.5%**
2006 to 2011	26	42.6%	66	47.5%	**92**	**46.0%**
Don't Know	0	0.0%	2	1.4%	**2**	**1.0%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

Nearly half of respondents (46.0%) joined the MBG from 2006-2011 with just over a third joining from 2001-2005. Northern Region respondents have generally been members for longer, which matches the pattern observed in the 2010 AFS.

The majority of the respondents reported that their main reason for joining the MBG was to get access to dairy cows (52.5%), followed by 'increase income/poverty reduction' (37.0%). In 2010, the main reason was overwhelmingly 'to get cows' but the option of increasing

income/reducing poverty was not offered. This was included in 2012 based on several farmers giving it as an unprompted reason in 2010, and its inclusion has brought out a more nuanced response with over half of respondents still giving the reason for access to cows, and over one third giving the new option of increase income/reduce poverty.

Table 53: Main Reason for Joining, by Region

Q.5-02 When joining the MBG, what was the main reason?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
To get access to dairy cows	22	36.1%	83	59.7%	**105**	**52.5%**
To increase my income/reduce poverty	28	45.9%	46	33.1%	**74**	**37.0%**
To learn how to look after my cow	6	9.8%	4	2.9%	**10**	**5.0%**
To increase my production	3	4.9%	3	2.2%	**6**	**3.0%**
To sell my milk	1	1.6%	2	1.4%	**3**	**1.5%**
Other	1	1.6%	0	0.0%	**1**	**0.5%**
No response	0	0.0%	1	0.7%	**1**	**0.5%**
To get inputs	0	0.0%	0	0.0%	**0**	**0.0%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

Nno respondents mentioned joining 'to get inputs' and only 1.5% mentioned 'to sell my milk'. As these options were not mentioned frequently as either a second or third reason, this suggests that inputs may readily be accessed outside the MBG.

Table 54: Second Most Important Reason, by Region

Q.5-02 When joining the MBG, what was the second most important reason?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
To increase my income/reduce poverty	9	14.8%	51	36.7%	**60**	**30.0%**
To get access to dairy cows	8	13.1%	38	27.3%	**46**	**23.0%**
Other	13	21.3%	8	5.8%	**21**	**10.5%**
To learn how to look after my cow	7	11.5%	4	2.9%	**11**	**5.5%**
To sell my milk	4	6.6%	5	3.6%	**9**	**4.5%**
To increase my production	2	3.3%	3	2.2%	**5**	**2.5%**
To get inputs	2	3.3%	0	0.0%	**2**	**1.0%**
No response	16	26.2%	30	21.6%	**46**	**23.0%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

Increase income/poverty reduction (30.0%) and access to dairy cows (23.0%) are the two main 'second most important reasons' for joining the MBG.

Table 55: Third Most Important Reason, by Region

Q.5-02 When joining the MBG, what was the third most important reason	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
To learn how to look after my cow	3	4.9%	23	16.5%	**26**	**13.0%**
To sell my milk	2	3.3%	13	9.4%	**15**	**7.5%**
Other	5	8.2%	9	6.5%	**14**	**7.0%**
To increase my income/reduce poverty	2	3.3%	8	5.8%	**10**	**5.0%**
To get inputs	0	0.0%	5	3.6%	**5**	**2.5%**
To get access to dairy cows	1	1.6%	2	1.4%	**3**	**1.5%**
To increase my production	1	1.6%	0	0.0%	**1**	**0.5%**
No response	47	77.0%	79	56.8%	**126**	**63.0%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

The majority of the respondents did not respond to this question (63.0%). However, the remaining 37.0% gave wanting to learn how to look after cows (13.0%) and selling milk (7.5%). This is useful in that it highlights that these are additional reasons for joining.

Table 56: Services Provided by the MBG to Members, by Region

Q.5-03 What services does the MBG offer to you as a member/beneficiary?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Training / extension on dairy farming	39	63.9%	124	89.2%	163	81.5%
Buying of milk for sale to others	15	24.6%	57	41.0%	72	36.0%
Source of veterinary services and advice	21	34.4%	40	28.8%	61	30.5%
Source of feed and minerals	8	13.1%	38	27.3%	46	23.0%
Source of veterinary drugs and tick sprays	12	19.7%	20	14.4%	32	16.0%
Other	16	26.2%	16	11.5%	32	16.0%
Training in HIV/AIDS, business, finance etc.	4	6.6%	20	14.4%	24	12.0%
Source of artificial insemination ("AI") services	3	4.9%	10	7.2%	13	6.5%

Source: Consultant Survey, n=200 farmers, Multiple response - % as of n=200

In relation to the services provided by the MBG, multiple responses were possible. The majority (81.5%) of the sample reported training / extension on dairy farming followed by buying of milk for sale to others (36.0%). Combining source of veterinary services and advice (30.6%) and source of veterinary drugs and tick sprays (16.0%), highlights the importance of this area.

Looking at the services offered in the MBGs in 2010, training extension on dairy farming was also the most common response (93.5%). Source of veterinary services and advice was more commonly mentioned in 2010. This may not be a reflection of actual services available, rather it is what the members identified as being the services available.

It is surprising to note that only 12.0% of respondents reported "Training in HIV/AIDS, business, finance etc" as a service offered by the MBG, whereas 95.5% of the sample reported receiving HIV messages through their MBG. The responses depend on what activities the farmers think of as **services from the MBGs**. Hence, they see HIV/AIDS messages and training received (although through the MBG) as a service offered by NAPHAM, MAICC or Land O'Lakes, rather than a service from the MBG.

There were sufficient 'other' responses to warrant investigation of what services were mentioned in this category.

Table 57: Services Provided by the MBG to Members– Other

What services does the MBG offer to you as a member/beneficiary? (Other) - Five most common responses	Total	
	#	%
Access to loans	11	5.5%
Financial support during funerals	2	1.0%
Financial/other help in times of need	3	1.5%
Proper livestock management training	5	2.5%
Source of cows	7	3.5%

Source: Consultant Survey, n=28/32 farmers reporting 'other', Multiple response - % as of n=200

The most common responses amongst the 'others' was access to loans, mentioned by 5.5% of the entire sample. 3.5% of respondents also saw provision of cows as service provided by the MBG.

Table 58: MBG Services Satisfaction Levels

Q.5-04 Overall, how satisfied are you with the MBG ….?	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
a. As a buyer of my milk	43.0%	34.0%	7.0%	15.0%	1.0%
b. As a source of dairy cows	68.0%	31.5%	0.0%	0.5%	0.0%
c. As a source to learn how to look after my cows	79.5%	19.5%	0.5%	0.5%	0.0%
d. As a place to get feed and vet drugs	68.0%	27.5%	1.5%	3.0%	0.0%
e. As a place to get AI services	61.5%	37.0%	0.0%	1.0%	0.5%
f. To have solidarity with others	65.5%	33.5%	0.5%	0.5%	0.0%

Source: Consultant Survey, n=200

For all the services provided by the MBGs, the overwhelming majority of respondents reported that they were very satisfied or satisfied with the services. This is very similar overall to 2010 AFS, except that there has been a small fall in the proportion who are satisfied, and an increase in the proportion that are dissatisfied with the milk buying service. Interestingly, the proportion of dissatisfied respondents in the Central Region at 16.5% is higher than in Northern Region at 11.5%. This result is attributed to late payment by one of the processors, as well as that Northern Region farmers have dealt with late payments for a longer period of time and have come to expect it.

Out of the many training courses conducted through the MBGs, looking after cows was the most commonly mentioned at 84.0%. This was followed by training in fodder conservation (41.0%) and in HIV/AIDS awareness and action (36.0%). Again, this is considerably lower than the 95.5% who said they had received HIV/AIDS messages though their MBG.

Table 59: Training Courses Conducted at the MBG, by Region

Q.5-05 What training have you received from or through your MBG in the last five years?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Looking after cows	51	83.6%	117	84.2%	**168**	**84.0%**
Fodder conservation	29	47.5%	53	38.1%	**82**	**41.0%**
HIV/AIDS awareness and action	18	29.5%	54	38.8%	**72**	**36.0%**
Khola/shed construction	16	26.2%	50	36.0%	**66**	**33.0%**
Other	21	34.4%	35	25.2%	**56**	**28.0%**
Heat and insemination	11	18.0%	25	18.0%	**36**	**18.0%**
Co-operative development	3	4.9%	32	23.0%	**35**	**17.5%**
Soy production	12	19.7%	19	13.7%	**31**	**15.5%**
Agricultural pasture establishment	15	24.6%	10	7.2%	**25**	**12.5%**
Business and enterprise	2	3.3%	22	15.8%	**24**	**12.0%**
VS&L group formation & mgt	8	13.1%	14	10.1%	**22**	**11.0%**
Environment risks (urine, dung etc)	6	9.8%	15	10.8%	**21**	**10.5%**
Finance	4	6.6%	15	10.8%	**19**	**9.5%**

Source: Consultant Survey, n=200 farmers, Multiple response - % as of n=200

This question was first asked unprompted and then prompted (see Annex 5: Farmer Questionnaire). The unprompted responses are analyzed here as this removes risk of the leading the respondent's answers. The prompted response to this question found 61.5%

said they had received training in HIV/AIDS awareness, which is much closer to the earlier findings. Furthermore, as mentioned earlier, if the training is conducted by NAPHAM or MAICC, then some respondents may not associate this with the MBG. Finally, respondents may differentiate between 'training' and 'messages'. Messages could be simply a poster on the wall of the MBG explaining the dangers of HIV, whereas training may be seen as more involved and extensive.

There was little regional variation, other than co-operative development and business and enterprise being much higher in Central Region, and pasture establishment much higher in Northern Region.

Table 60: Accessibility to Other Services through the MBG, by Region

Q.5-06 Have you accessed any of the following services through your MBG or with the help of the MBG?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Opening a bank account (savings)	23	37.7%	113	81.3%	**136**	**68.0%**
Cow insurance	26	42.6%	96	69.1%	**122**	**61.0%**
Joining a village savings and loan group	35	57.4%	49	35.3%	**84**	**42.0%**
Information by SMS / text message	32	52.5%	36	25.9%	**68**	**34.0%**
Getting a loan from a bank or other lender	6	9.8%	7	5.0%	**13**	**6.5%**
Airtel Money account	0	0.0%	1	0.7%	**1**	**0.5%**

Source: Consultant Survey, n=200 farmers, Multiple response - % as of n=200

The majority (68.0%) of the sampled respondents reported opening bank accounts. This was followed in frequency by cow insurance and VS&L with 61.0% and 42.0% respectively. While the overall impact on livelihoods is not explicit here, the fact that 61.0% of the sample accessed a VS&L group through their MBG suggests a high uptake and at the very least a good perception of the potential impacts of VS&L groups amongst MBG members.

A considerably higher proportion of Central Region respondents reported opening a bank account (81.3%) compared to Northern Region (37.7%). The same pattern was observed for cow insurance at 69.1% in Central Region compared to 42.6% in Northern Region. The reverse was true for 'information by SMS/text messages' and VS&L groups in which a much higher proportion of Northern Region respondents responded positively.

These are important outcomes. Although the responsibility is not entirely with the project, as it is also a result of the service providers in banking, insurance and texting, the levels of access to bank accounts and cow insurance are very impressive. In 2008, FinScope Malawi, a nationally representative financial sector survey, found that only 19% of the adult population had bank accounts.

At 81.3% in Central Region and 68.0% overall, these levels are very high and suggest that the MDDA has assisted dairy farmers to become banked and therefore financially included.

This question was not asked in 2010, so no direct comparison is possible.

3.8 Employment

This section looks at issues of employment. Strictly speaking, it is more about 'work' than 'employment', especially at the farm level, as formal employment of workers is rare, being more informal arrangements, and family members are not employed. The term work and worker is more appropriate, but are used alongside employment.

It is interesting to note that wives are more involved in taking care of the dairy cows, with nearly all of them involved (96.5%). There is a regional variation in the proportion of

husbands involved, with only 73.8% involved in Northern Region compared to 93.5% of husbands in Central Region.

Table 61: Division of Labor within the Household, by Region

Q.6-01a Who works in the dairy enterprise?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Husband	45	73.8%	130	93.5%	175	87.5%
Wife	58	95.1%	134	96.4%	193	96.5%
Children (male)	49	80.3%	119	85.6%	169	84.5%
Children (female)	41	67.2%	81	58.3%	122	61.0%
Other relatives (male)	2	3.3%	9	6.5%	11	5.5%
Other relatives (female)	1	1.6%	4	2.9%	5	2.5%
Hired workers full time (male)	9	14.8%	37	26.6%	46	23.0%
Hired workers full time (female)	0	0.0%	2	1.4%	2	1.0%
Hired workers part time (male)	7	11.5%	8	5.8%	15	7.5%
Hired workers part time (female)	2	3.3%	2	1.4%	4	2.0%

Source: Consultant Survey, n=200 farmers, Multiple response - % as of n=200

The table below gives a more detailed breakdown of the relative proportions in relation to the level of tasks performed by each participant in the dairy enterprise. This shows that where men/husbands are involved, particularly in Central Region, the majority are involved in all tasks, whereas a quarter of women/wives in Central are only involved in a few tasks.

Table 62: Level of Involvement of Household Member in Dairy Enterprise, by Region

Q.6.01b Does this person do…..	All tasks			Many tasks			A few tasks		
	North	Center	Total	North	Center	Total	North	Center	Total
a. Husband	49.2%	58.3%	55.5%	21.3%	28.8%	26.5%	3.3%	6.5%	5.5%
b. Wife	54.1%	39.6%	44.0%	34.4%	31.7%	32.5%	6.6%	25.2%	19.5%
c. Children (male)	11.5%	32.4%	26.0%	41.0%	33.1%	35.5%	27.9%	20.1%	22.5%
d. Children (female)	8.2%	20.9%	17.0%	21.3%	18.0%	19.0%	37.7%	19.4%	25.0%
e. Other relatives (male)	1.6%	0.7%	1.0%	0.0%	5.0%	3.5%	1.6%	0.7%	1.0%
f. Other relatives (female)	0.0%	0.0%	0.0%	0.0%	1.4%	1.0%	1.6%	1.4%	1.5%
g. Hired workers full time (male)	14.8%	22.3%	20.0%	0.0%	2.2%	1.5%	0.0%	2.2%	1.5%
h. Hired workers full time (female)	0.0%	0.0%	0.0%	0.0%	1.4%	1.0%	0.0%	0.0%	0.0%
i. Hired workers part time (male)	3.3%	0.7%	1.5%	1.6%	2.2%	2.0%	6.6%	2.9%	4.0%
j. Hired workers part time (female)	1.6%	0.0%	0.5%	0.0%	0.0%	0.0%	1.6%	1.4%	1.5%

Source: Consultant Survey, n=200

Comparing the findings of 2012 and 2010 studies, there has been an increase in the proportion of hired full time male employment reportedly undertaking all tasks, which appears to be at the expense of the husband and wife. This may reflect that the sample had families with more cows, and either that this necessitated or supported more hired labor enabling the husband and wife to undertake other activities. In 2010, 17.8% of respondents reported hired full time labor (male, with virtually no female), whereas in 2012, the figure was reported to be 23.0% male hired full time labor. This is indicative of a shift to a more substantial dairy enterprise that is able to and needs to employ labor.

From the above data, the calculated[21] workers in each category were: All tasks – 3,025, Most tasks – 2,268, A few tasks – 1,521. If the total of workers is determined as the sum of the first two categories, then the total number of workers for the 1,822 farmers with cows is 5,293. This is a mean of 2.91 people/household for all or most tasks.

The 2010 AFS reported the following comparable results: All tasks – 3,011, Most tasks – 1,429, A few tasks – 540, the total workers was thus 4,440 and the mean workers per household (1,452 in 2010) was 3.05 for all or most tasks, as the number of farmers with cows was smaller.

The data reveals **an increase of 853 'workers' in the dairy enterprise in 2011** compared to the same measure in 2010, which equates to a 19.2% increase in work generated. This may tentatively be linked to an increase in work generated, particular when taken in tandem with the findings in the previous paragraph on an increase in hired workers. There appears to have been an intensification of work as considerably more farmers report undertaking most or some tasks. This would be consistent and a product of higher cow ownership reported earlier.

Looking at **employment at the MBG**, the committee interviews found that in 2011 there were on average 8.65 full and part-time employees per MBG, compared to 7.88 in 2010.

3.9 Milk Buyers

The majority (75.0%) of the farmers sell all their milk to the MBG, with Central Region at 82.0% and Northern Region at only 59.0%. This reflects the marketing situation of Northern Region and the breaking down of arrangements.

Table 63: Volume of Milk Sales to Different Buyers

Q.6-02 Of the milk you sell, how much do the following buy?	All	> half	Half	< half	None	Not yet milking
MBG	75.0%	22.5%	0.0%	0.0%	0.5%	2.0%
Vendors	0.0%	0.0%	1.5%	6.5%	90.0%	2.0%
Neighbors	0.0%	0.0%	0.0%	18.5%	79.5%	2.0%
People at local market	0.0%	0.0%	0.0%	3.0%	95.0%	2.0%
Processors (direct sales)	0.0%	0.5%	0.0%	0.5%	97.0%	2.0%
Local Businesses	0.0%	0.0%	0.0%	0.0%	98.0%	2.0%

Source: Consultant Survey, n=200

The main alternative to the MBG for selling milk to is reported to be neighbors, with only 8% mentioning vendors. It is possible that farmers have not truthfully responded to this question on the proportions and where the balance is sold, based on the KII data.

Table 64: Reliability of Markets, by Region

Q6-03. How reliable is buying at ...	Always Reliable	Mostly Reliable	Sometimes Reliable	Never Reliable	Not yet milking	
	Total	Total	Total	Total	Total	
MBG	71.0%	20.0%	4.5%	3.0%	1.5%	n=198
Vendors	0.0%	1.1%	6.8%	90.9%	1.1%	n=88
Neighbors	0.9%	0.0%	23.6%	74.5%	0.9%	n=106
People at local market	1.2%	0.0%	1.2%	96.4%	1.2%	n=84
Local Businesses	1.2%	0.0%	1.2%	96.5%	1.2%	n=85

Source: Consultant Survey, n=as shown

[21] By multiplying the total workers in each category in the sample by the total number of farmers with cows in the population, then dividing by the sample size n=200

The overwhelming responses were that the MBG is the most reliable buyer, whereas vendors, people at local markets and local businesses are never reliable. Neighbors are seen as occasionally reliable by some (23.6%).

Table 65: Which Buyer Pays the Best Prices, by Region

Q.6-04a Who pays the best prices?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
MBG	19	31.1%	91	65.5%	110	**55.0%**
Vendors	16	26.2%	29	20.9%	45	**22.5%**
Neighbors	18	29.5%	12	8.6%	30	**15.0%**
Local market customers	1	1.6%	0	0.0%	1	**0.5%**
Local businesses (shops, restaurants)	1	1.6%	3	2.2%	4	**2.0%**
All buy at the same price	6	9.8%	4	2.9%	10	**5.0%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

The majority of the respondents (55.0%) reported that their MBG gives them the best price followed by vendors (22.5%) and neighbors (15%). A much higher proportion of Central Region respondents reported that MBGs pay the best price (65.5%) compared to Northern Region respondents (31.1%).

The MBG also maintained its status of being the best in offering good prices to the farmers though there was a decrease from 82.1% in 2010 to 55.0% in 2012. Vendors increasing from 10.6% in 2010 to 22.5% in 2012 complemented this.

Table 66: Farmer Preference of Buyer to Sell Milk to, by Region

Q.6-05 Who do you prefer to sell your milk to?	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
MBG	59	96.7%	136	97.8%	195	**97.5%**
Vendors	0	0.0%	0	0.0%	0	**0.0%**
Neighbors	0	0.0%	0	0.0%	0	**0.0%**
Local market customers	0	0.0%	0	0.0%	0	**0.0%**
Local businesses (shops, restaurants)	0	0.0%	0	0.0%	0	**0.0%**
Other	0	0.0%	2	1.4%	2	**1.0%**
No Response	2	3.3%	1	0.7%	3	**1.5%**
Total	**61**	**100.0%**	**139**	**100.0%**	**200**	**100.0%**

Source: Consultant Survey, n=200

Almost all respondents preferred selling their milk to the MBG. The strength of the preference increased in 2012 from the 74.7% reported in 2010.

This result, as well as the data for Q6-04a, gives support to the suggestion that MBG members were underreporting sales to vendors. If 22.5% believe vendors pay the best price, it seems highly unlikely that 90% would sell none of their milk to vendors. Also, that respondents almost unanimously said they prefer to sell to MBGs, though not all of them always do, could suggest that they felt they should respond in a pro-MBG manner to this and other questions.

3.10 Nutrition

The final question was included by Land O'Lakes to measure household nutrition.

Table 67: Foods Eaten the Previous Day, by Region

Q.6-06 What food did you eat yesterday	Region				Total	
	Northern		Central			
	#	%	#	%	#	%
Nsima, Rice, cereals etc	61	100.0%	139	100.0%	200	**100.0%**
Cassava, Potatoes, others tubers	31	50.8%	58	41.7%	89	**44.5%**
Vegetables	55	90.2%	138	99.3%	193	**96.5%**
Fruits	53	86.9%	119	85.6%	172	**86.0%**
Meat, meat products	13	21.3%	43	30.9%	56	**28.0%**
Eggs	20	32.8%	37	26.6%	57	**28.5%**
Fish (dry or fresh)	19	31.1%	44	31.7%	63	**31.5%**
Beans, groundnuts etc	23	37.7%	83	59.7%	106	**53.0%**
Milk, cheese, yoghurt etc	56	91.8%	128	92.1%	184	**92.0%**
Butter, other oils	9	14.8%	31	22.3%	40	**20.0%**
Sugar, honey	55	90.2%	127	91.4%	182	**91.0%**

Source: Consultant Survey, n=200

The study shows that the category of nsima/rice/cereals was universally consumed, meaning in Malawi's terms that nobody went hungry. Given that the survey was in January, which is one of the so-called hungry months, then this is a good indicator that the farmers are not going hungry. Vegetables (96.5%), milk/cheese/yoghurt (92.0%), sugar/honey (91.0%) and fruits (86.0%) are very commonly consumed categories.

This question was used to calculate the **Household Dietary Diversity Score (HDDS)** for the measurement of household food access. From the responses, an HDDS indicator was calculated using the following method:

- HDDS (0-11) = Total number of food groups consumed by members of the household. Values for A through K will be either "0" or "1".
- Sum (A + B + C + D + E + F + G + H + I + J + K)
- Second, the average HDDS indicator is calculated for the sample population.
- Average HDDS = $\frac{\text{Sum (HDDS)}}{\text{Total Number of Households}}$

The results are given in the table below:

Table 68: Range and Mean of HDDS Indicators, by Region

HDDS Indicator	Northern Region				
	N	Minimum	Maximum	Mean	Std Dev
HDDA (0-11) variable	61	3.00	10.00	6.47	1.52
HDDS Indicator	**Central Region**				
	N	**Minimum**	**Maximum**	**Mean**	**Std Dev**
HDDA (0-11) variable	139	2.00	10.00	6.80	1.58
HDDS Indicator	**Total**				
	N	**Minimum**	**Maximum**	**Mean**	**Std Dev**
HDDA (0-11) variable	200	2.00	10.00	6.70	1.57

Source: Consultant's Calculations and Survey

The overall average HDDS indicator for the sample was 6.70, where a score closer to 11 indicates a better dietary diversity and a score closer to 0 indicates a worse dietary diversity. The data shows that Central Region respondents had a slightly higher dietary diversity than those in Northern Region, but they are essentially the same.

4 MBG Survey Findings

A separate questionnaire was used to gather information from 17 MBG committees. The questionnaire is included in **Error! Reference source not found.** and a full narrative summary of the responses has been provided to Land O'Lakes. Below is a summary of the collected data. This section summarizes the quantitative and qualitative data gathered from group interviews with the MBG Committees. Where possible this data was checked with the written records.

4.1 MBG Committee Interviews - Quantitative Data

According to the data collected, MBGs in Northern Region were established between 1979 and 2004 with 1991 as the mean year. In Central Region, the MBGs were established between 1972 and 1989 with 1979 as the mean year.

The study also showed that the **mean number of farmers selling their milk to the MBGs** increased from 66 in 2006 to 131 in 2011, which is a major increase and a likely substantial contribution to MBG viability. The pattern has been consistent growth over that period overall particularly in Central Region. However, in Northern Region, the mean fell from a high of 42 in 2006 to a low of 32 in 2008, before recovering each year to reach 40 farmers in 2011. Higher growth for Central Region more than offset Northern Region's decline.

The **volume of milk collected in the MBGs** plus the volume of **milk sold by the MBGs to the processors**, did not follow the same pattern. The average volume of milk collected at the MBGs in 2006 was 137,175 liters, which fell to a low of 68,985 liters in 2008. This climbed back to 132,223 liters in 2010 but fell back to 106,713 in 2011. The pattern was similar in both regions. This inconsistency of volume figures is attributed to many reasons from non-delivery of milk because of mechanical fault in some MBGs, the breakdown in AI services and related decline in pregnancy rates in 2010, the closure of NDI and late payments by processors.

In Northern Region, MBGs are most commonly **selling their milk to vendors**, followed by MDFA with mean sales of 27,523 and 6,665 liters respectively. The MBGs have had little choice due to the breakdown of marketing arrangements. However, in Central Region, the MBGs sell their milk to Lilongwe Dairies, followed by MDI with mean sales of 153,398 and 16,861 liters respectively.

The **proportion of milk sold to processors** in Northern Region has declined since 2006 from an average of 79.3% to a low of 43.3% in 2011. In Central Region, the proportion has been consistently 100% of milk sold to processors from 2006 to 2011.

The study found that the processors in Central Region offer better **net prices** (MK 62/ltr) compared to Northern Region (MK 54/ltr). This pattern is consistent with the findings in the farmer survey, although the prices in the survey were higher (MK 67.58 and MK 59.58 in Central and Northern Region respectively) and appear to closely reflect the reported gross prices (MK 68 and MK 62). In terms of deductions, it was interesting to note that all Central Region MBGs reported paying withholding tax, but no Northern Region MBGs did. In both regions, the other price deductions were an MBG levy and the RPA levy

The **mean amount of storage capacity** across the sample was 1,585 Ltrs/MBG. Northern Region had less storage capacity than Central Region at 1,343 Ltrs/MBG compared to 2,010 Ltrs/MBG. DANIDA was the most common supplier of storage tanks to the MBGs.

MBGs in Central Region have steadily increased the volume of supplementary feeds supplied to their farmers from 270 kgs/month/MBG to 513 kgs/month/MBG. Northern Region MBGs reported very low volumes and fluctuating supply of supplementary feeds to farmers across the years from 27 kgs/month/MBG to zero in 2008, but recovering to 11

kgs/month/MBG. The majority of the MBGs in both Central and Northern Regions are currently supplied by Ndatani Feeds.[22]

Over time, there is a reportedly steady increase in the **mean number of people employed**, both temporary and permanent in the MBGs. In Northern Region, it increased from three in 2006 to four in 2011. In Central Region, the mean was six in 2006 increasing to 12 in 2011.

There has been an exponential increase in the **mean number of OVCs** served through MBG HIV/AIDS initiatives in Central Region from 19/MBG to 94/MBG from 2009-2011. This compares to an increase from 14/MBG to 18/MBG in Northern Region the same period.

The number of people trained in HIV/AIDS prevention education sessions at MBGs also increased year on year. In 2010, the mean was 124 compared to 142 in 2012, being a 15% increase.

The same trend (plus 14.6%) was reported on the number of Ltrs donated to OVCs across the regions. In 2012 the overall mean figure was 476 Ltrs, compared to 416 Ltrs in 2010.

The number of nutrition, milk handling and hygiene education sessions conducted in CBCCs in each MBG varied considerably. In Northern Region the mean number in 2011 was 0.8 sessions – three out of seven MBGs in Northern Region reported no sessions at all (Kapacha, Kavuzi and Doroba). However, this represents an improvement from 2010 and 2009. In the Central Region, one MBG (Namwiri) reported six such sessions. The mean amount in the Central Region was 2.8/MBG.

4.2 MBG Committee Interviews – Qualitative Data

Overall, there was an average of two training courses on nutrition, milk handling and hygiene within the MBGs, with a higher proportion in Central Region. As regards the number of farmers who received the training, Central Region dominated with an average of 41 farmers in 2009 and 61 farmers in 2010, against 25 farmers in 2009 and 45 farmers in 2010 respectively in Northern Region. The same trend was noted with the number of farmers trained in HIV/AIDS prevention.

On the successes and challenges encountered with the ***heat synchronization (HS) program***, the views below were gathered across all MBGs visited with minor variation within each regions. These points are arranged in order of importance.

Successes:

a. Most farmers are now able to detect the cow when it is on heat and report
b. The hormones have helped promote pregnancy in cows
c. Farmers are given a chance to choose the breed they want

"The trainings we have received from Land O'Lakes have helped farmers because most of them are able to detect heat in their cows and report to technicians to have them inseminate - Lusangazi MBG"

Challenges:

a. Some cows have silent heat and are difficult to detect
b. There is always insufficient supply of semen because of lack of liquid nitrogen
c. Most of the time the insemination fails because of dead semen or other factors
d. The few extension workers do not visit all the farmers due to geography
e. Some cows do not show heat signs even after injecting them with hormones

"Sometimes the cows' reactions were different after administering the heat synchronization. For example, cows were expected to be on heat after three days from the date of

[22] Ndatani feeds started supplying Northern Region in 2011 following the feed demonstration open day.

synchronization but some of them were not showing the signs as expected." Chitsanzo MBG

Below are the general views on the successes and challenges encountered with the ***CAHNW and PESPS on animal husbandry*** arranged in order of importance.

Successes:

a. Extension workers help farmers on good khola construction and cow management practices
b. There is a general increase in milk production because of their informal trainings in good animal husbandry practice
c. Deaths of cows have decreased because of training in disease preventive measures and good drug administration

"Animal health and nutrition workers have helped farmers to increase their cows' milk production because of the informal trainings they give to farmers. These trainings include approved kraal construction and other good animal husbandry" Lukonkhowe MBG

Challenges:

a. Transport is a problem, so extension workers fail to visit all farmers
b. Most of the time there are insufficient drugs at the MBGs to meet the demand
c. There is insufficient protective clothing when handling drugs
d. There are insufficient allowances for CAHNW, though it is a voluntary job. As a result, some have stopped doing their work
e. The extension workers need refresher trainings.

"Our main challenge is transport for our extension workers. As of now, they only have one bicycle which they share to reach out to farmers" Namwiri MBG[23]

On ***access to financial services***, such as VS&L, SMS services, NBS savings and loans, and insurance, the following successes and challenges were reported:

Successes:

a. Most farmers have bought insurance policies from Nico Insurance for their cows
b. Some farmers opened accounts with NBS and saved, but rarely access loans
c. Esoko/SMS is helping farmers a lot through good animal husbandry tips from Land O'Lakes
d. Some farmers have access to loans through VS&L

"Out of 66 farmers here, 48 have insured their cows with Nico insurance" Kapacha MBG

Challenges:

a. Late or no compensation of death of cows by Nico insurance

"Few farmers have insured their dairy cows because most farmers have been frustrated because some who had insured their cows were not compensated after the death of their livestock – Machite MBG"

On successes and challenges with the ***training in nutrition***, the points are arranged in order of importance:

Successes:

a. People now know the nutrition value of milk and every day they try to keep some for their family

[23] The three trained CAHNWs were reportedly not very motivated. As a result, the MBG hired an extension worker to replace the CAHNWs. This person was recently recruited by CREMPA.

b. Hygiene in milk handling has improved in the CBCCs
c. There has been health improvement for PLWHA especially in the CBCCs

"Children in the CBCCs have improved in health and are active in class" Mpalo MBG

Challenges:

a. Many people (in some MBGs) did not receive nutrition trainings.

Successes and challenges with the ***training in Co-operative Development*** at farmer level are listed below in order of importance:

Successes:

a. Farmers are able to keep records of milk production and sales
b. Farmers are able to make proper planning on when to buy the feed
c. MBG members can find other markets when their usual buyers are not reliable

"Most farmers are now able to keep records of their milk sales and expenditures and are able to calculate profits" Kawindula MBG

Challenges:

a. Farmers cannot save much because of low prices of milk
b. Refreshers courses are not available and farmers tend to forget[24]
c. Farmers cannot start other businesses due to lack of capital
d. The trainings are not conducted frequently

"Farmers have the mandate to buy shares but there is lack of understanding about it." Chitsanzo MBG

On successes and challenges encountered with the ***trainings in women rights***, the generalized views were:

Successes:

a. Women are now able to express their views even in the presence of men
b. Women have now realized that they can participate in any activities at all levels
c. Women are now more independent than before and are able to run businesses without the help of their husband
d. There is now good interaction between men and women; men no longer consider women inferior
e. Income and expenditure is now more transparent between husbands and wives
f. Some men have started respecting the rights of women

"Women are now able to express themselves and contribute substantially to the day to day running of the MBG without being intimidated by men. Now the committee has 4 female members out of 11 members" Kawindula MBG

Challenges:

a. Some men are still stubborn about women rights and do not respect them
b. Some men force their wives not to attend such trainings
c. Most men are still in control of almost everything in their homes

"Some men are so resistant to change and do not accept the concept of women having rights. This has led them to forcing their wives not to attend such trainings" Lukonkhowe MBG

[24] At the four focus MBGs (Dzaonewekha, Chitsanzo, Machite and Magomero), lead farmers were trained to help other farmers with record keeping.

Views on observed ***changes in the roles of men and women in the dairy farms*** are summarized as follows:

Successes

a. Women now take part in roles that were considered only for men e.g. khola maintenance
b. Women are involved in decision making at the MBG
c. Women are now able to take leadership positions that were specifically for men

"More women are now actively taking part in decision making at all levels. It has also just been realized that women can also part in roles that were initially thought to be for men e.g. general kraal maintenance – Lusangazi MBG"

A number of other general comments and suggestions were made:

a. Reliable markets are needed for milk or a milk processing plant in the MBGs so that they can add value to the milk.
b. More improved cows are needed because the pass on program alone cannot meet the demand of the cows.
c. More feed and drugs needed in the MBGs
d. More trainings needed in cow management
e. Motor bikes needed for technicians and extension workers
f. The government should provide electricity at the MBGs
g. More churns are needed
h. Professional help is needed to service the engine in the MBGs

Table 69: Performance Indicators USAID Operational, MDDA 2011-12

Indicators	Unit of Measure	Direction of Change	Baseline (31 Dec 10)	Target during Ext'n	Q1	Q2	Q3	Q4	Q5	Cumulative for Ext'n
STANDARD USG INDICATORS										
USAID Operational Indicators										
1. Number of Individuals receiving HIV/AIDS prevention interventions	Individuals	+	2,664	6,000	1,677	3,943	3,138	3,112	n/a	11,870
	Females	+	n/a	n/a	1,142	2,573	1,937	1,734	n/a	7,386
	Males	+	n/a	n/a	535	1,370	1,201	1,378	n/a	4,484
2. Number of OVC served by OVC programs (OVC receiving nutritional support through 1% of milk production	Individuals	+	1,914	600	228	365	525	85	n/a	1,203
	Females	+	n/a	n/a	121	262	320	45	n/a	748
	Males	+	n/a	n/a	106	103	205	40	n/a	454
3. Number of farmers, processors, and others who have adopted new technologies or management practices as a result of USG assistance	Individuals / Organizations	+	1,563	400	84	337	531	653	n/a	1,605
	Females	+	n/a	n/a	44	137	168	262	n/a	611
	Males	+	n/a	n/a	39	197	363	391	n/a	990
	Organizations	+	n/a	n/a	1	3	0	0	n/a	4
4. Number of individuals who have received USG supported short-term agriculture sector productivity training with USG assistance sex-disaggregated	Individuals	+	5,190	900	1,470	1,325	962	1,461	n/a	5,218
	Females	+	2,378	412	682	577	614	833	n/a	2,706
	Males	+	2,812	488	788	649	348	628	n/a	2,413
5. Economic Strengthening: Number of HIV care and support associations provided with economic strengthening capacity building	Individuals	+	-	12	4	2	3	3	n/a	12

Source: Land O'Lakes Quarterly Reports

5 Performance Indicator Findings

This section combines the findings from the farmer survey and the MBG survey in the previous two sections with information from documented sources and Key Informant Interviews (KIIs).

The summary performance indicators for the MDDA extension are set out in Table 69 and

Table 70 including the baseline (31 December 2010) and the targets. The indicators are analyzed section by section.

5.1 USAID Operational Indicators 1-5

This cluster of five indicators are: HIV/AIDS prevention interventions (#1), OVCs served with nutritional support (#2), farmers/processors/others adopting new technologies or management practices (#3), agricultural productivity training (#4) and HIV Care institutions supported (#5). The full wording of each indicator is set out below.

 # 1: Number of Individuals receiving HIV/AIDS prevention interventions

The baseline for this indicator was 2,664 individuals, with a target of 6,000 additional individuals. By Qtr 4, 11,870 individuals had received HIV/AIDS prevention interventions, which is 198% of target and 446% of the baseline (7,386 women, 4,484 men). The positive finding was supported by data from farmer and MBG Committee interviews, with the former reporting that 94.5% of the sample of 200 MBG members with cows received HIV/AIDS awareness messages through their MBG. **This is a very high rate of report and suggests almost comprehensive coverage.**

Activities under this indicator were delivered through NAPHAM and MAICC. It included training by Land O'Lakes of master trainers who then trained committees, members and community members (using Bridge of Hope tools); implementing HIV/AIDS awareness initiatives; and implementing HIV Testing and Counseling (HTC). The evaluation team met both organizations during the evaluation and discussed their programs.

MAICC[25] is involved in:

- ⇒ Disseminating HIV/AIDS prevention messages,
- ⇒ Providing HIV testing and counseling to MBGs and a door to door program
- ⇒ Conducting outreach programs to communities around Dowa and Ntchisi
- ⇒ Coordinating youth anti-AIDS activities including life skills disseminated through drama

MIACC has worked with MBG leadership and members, as well as communities, MAICC report that the training has addressed misconceptions around HIV/AIDS, helped PLWHA know where to get drugs, prompted the community to engage in social activities and addressed stigmatism. This is consistent with Land O'Lakes' own reports.

In relation to HCT, the implementation was reported by MAICC to have been mixed. There was a poor take up of the HCT kits at some of the seven MBGs targeted, such as Mponela, attributed to poor sensitization by the committee, but good use at others, such as Lumbadzi and Mpalo. MAICC indicated that the impact of its activities were also mixed, but specifically identified Mpalo MBG as one where there had been changes in behavior.

NAPHAM has been operating since 1993, with 62,000 members and providing services to PLHWA. It was contracted to provide HIV/AIDS awareness campaigns and HTC services for 16 CBCCs and 15 MBGs in Central and Northern Regions. NAPHAM had provided these services to MDDA in 2009, during which time support groups for PLHWA were established. Its programs cover:

- ⇒ Prevention care and support through community education and taking care of the chronically ill
- ⇒ Livelihood support to individuals and groups so that people can survive on their own

Advocacy for inclusion, starting at community level and through to national level to ensure PLHWA can participate in development. NAPHAM report that their work with Land O'Lakes since 2009 has included HIV/AIDS education, giving information and mobilizing people for HTC with nine MBGs in Northern Region and seven in Central Region. NAPHAM provided

[25] In 2009, NAPHAM partnered directly with MAICC for implementation; in 2011, Land O'Lakes worked directly with MAICC to help build their capacity.

kits and mobilized MBG farmers, families and communities through drama. Testing is at the MBG and links were made with NAPHAM groups nearby.

The results have easily exceeded the target and baseline. From a delivery point of view, NAPHAM and MAICC report some challenges with communications and links with MBGs that resulted in some logistical delays and that sometimes the requirements for delivery were too challenging, such as working at two MBGs in the same day. MAICC indicated that there had been some delay in receiving funding on certain occasions. Otherwise, both organizations regard the relationship as having been a good one, which the results support.

 # 2: Number of OVCs served by OVC programs

The baseline for this indicator was 1,914 OVCs served with a target for the extension of 600 more OVCs. By quarter 4, 1,203 OVCs had been added, split 748 female and 454 male. This was 201% of the target and the overall cumulative figure was 163% of the baseline. This component targeted the provision of milk by MBGs to OVCs via CBCCs, which is mixed with porridge or other foods to increase the nutritional value of the food and its palatability. The over achievement is attributed by Land O'Lakes to MBG Committees understanding the benefits to the community of this provision.

Kadale gathered data from the 17 MBGs[26] on OVCs served showed a rapid increase in OVCs served, so that the mean reported average was 63 more OVCs per MBG up from none in 2008. Of the MBGs met, 13 reported data for milk for OVCs. The mean reported volume over the 17 MBGs interviewed (considering that four MBGs did not supply any milk), was 476 liters/month, which was 14% higher than 2010 and 60% higher than 2009 on the same basis. This has resulted in a reported Qtr 4 total of 8,089 liters. There were no major issues reported with this activity.

 # 3: Number of farmers, processors, and others who have adopted new technologies or management practices as a result of USG assistance

The baseline for this indicator was 1,563 with an incremental target of 400. As of quarter 4, the data reported by Land O'Lakes is that 1,605 farmers, processors or others have benefited during the extension period, split 611 women and 990 men. This represents 401% of the target and 203% of the baseline.

This component included several planned elements, including loans from NBS Bank to buy insurance, testing and access to Airtel money services, cow insurance opening of bank accounts and fodder conservation. The component with Airtel had to be dropped, as approval for Airtel Money from the Reserve Bank of Malawi was substantially delayed to the point where it could not have been implemented within the MDDA period. Instead, Land O'Lakes formed a relationship with ESOKO and Wellspring[27] for Short Messaging Services (SMS) texting''. Land O'Lakes also worked with NBS Bank to bring banking services to MBG members through more tailored (savings) accounts and access to mobile banking units that visit the MBGs at least monthly.

Breaking down the achievement, Land O'Lakes reports that 551 farmers have paid premiums for cow insurance (252 women and 299 men), with premiums of MK 3,209,696 (US $19.5k) for animals valued at MK 68,680,000 (US $416.3k) for the year January to December 2011. A total of 127 farmers have received loans from NBS bank to buy insurance and 776 farmers have signed up for ESOKO SMS by Qtr 4.

Some of the data were not specifically reported in Qtr 4, such as bank accounts and fodder adoption, and so the most recent totals are from Qtr 3 being 116 farmers with NBS accounts

[26] Only 17 out of 23 MBGs were visited, so this represent only part of the overall achievement for all 23 MBGs. Also, some MBGs were not able to provide data for all questions. Therefore, figures from the 17 MBGs may not exactly tally with Land O'Lakes reported figures, which are more complete. The purpose was to provide independent cross checking of Land O'Lakes data, such that there would be some shortfall, but not a major discrepancy. There was also additional data collected from the MBGs that adds more detail.

[27] Name recently changed to Nzeru Systems

and the same number of (but not necessarily the same) farmers adopting fodder and silage conservation practices. Interestingly, the farmer survey found that 68.0% of famers report accessing a bank account via the MBG (81.3% in Central Region), and 6.5% also accessed loans. These figures suggest a higher level of achievement on accessing bank accounts than Land O'Lakes has been able to establish, but it is not known if these are all or mostly with NBS Bank. NBS report 760 accounts with MK 3.6m (US $ 21,818) deposits. This is a higher result than Land O'Lakes has recorded. **This is a significant number of farmers that are banked and contributes to the high proportions with accounts compared to the general population.**

NICO General provides the ***cow insurance.*** This has been a new initiative for NICO during the life of the MDDA. Land O'Lakes requires all cows given to farmers be insured by the farmer for one year or until it has passed on a calf. This is a sensible measure to protect a high value investment, in the hands of a new dairy farmer. It was not possible to get the proportion of farmers that renew their policy once it is no longer compulsory, but the number of policies identified by Land O'Lakes at 551 suggests that around 30% of all pure and cross-bred animals are insured. According to the farmer survey, 61.0% of farmers claimed to have accessed cow insurance through their MBG.

Land O'Lakes trained farmers, linked them to NICO, worked with NBS Bank to develop and launch a loan product under which farmers can buy insurance through small installments. Land O'Lakes also worked with NICO on how to modify marketing strategy to make it more appropriate to farmers.

NICO report that there have been a number of mis-claims and false claims. The former relate to situations where the policy does not apply, but that the farmer has tried to claim, such as on an expired policy or for a cause that is not covered, such as negligence by the farmer. The MBG Committees reported some slowness in payouts, but according to NICO General this is due to incomplete claims, as well as mis-claims and fraudulent claims. On the same lines, Land O'Lakes observed that some farmers do not fully pay their premiums until after a cow died; usually NICO still pays but there can be delays as the farmers need to pay the balance of their outstanding premiums. In some cases, the MBG leadership has failed to remit the premiums to NICO in time, which represents a misunderstanding of when the policy takes effect. NICO indicate that the insurance is not profitable for them and a result; premiums have risen in 2011 from 3% to 4% of the cow's value.

It is difficult to determine whether there are many invalid claims and how profitable or not the scheme is, as that is beyond the scope of the evaluation. It is likely that some of the issues could be resolved through a constructive dialogue between the parties to improve education of farmers on the value of insurance, improve understanding of the cover offered and claims process, and to review how to make the scheme as cost effective for farmers compatible with being sustainable and profitable for NICO General.

Overall, this is a useful innovation that requires some further adaptation.

It is therefore recommended that:

MMPA, CREMPA and MDFA continue to work with NICO to improve uptake, improve farmer understanding of the value of insurance, how to claim and negotiate a viable price for both parties.

The consultants met NBS Bank. The bank is providing a mix of ***banking services***, but importantly has started providing mobile ('bank-on-wheels') services to 11 Central Region MBGs. Linked to this, it provided a tailored account product with lower minimum balance (MK 200 – US $1.33), a free card for Automated Teller Machine access, one free withdrawal a month via the mobile bank and other reductions on charges. It appears that processors are now making payments via bank accounts, but sometimes the payments from processors are late causing problems with farmers trying to get their funds.

According to interviews with MBG Committees and farmers, this has proven to be popular allowing them to access basic accounts. As noted earlier, the level of access to a bank account appears to be high relative to the national population, let alone smallholder farmers.

The ***'Insurance Premium Facility'*** loans for insurance are reported to be a sensible response to the need for farmers to pay the insurance in advance. Although the uptake has not been high, this is quite a complex idea, especially in combination with insurance that is also not very common. FinScope Malawi 2008 found that only 3% of adults had any form of insurance, and much of that was compulsory insurance such as for motor cars. NBS Bank reported that they have a loan portfolio with dairy farmers in Central Region of MK 2.8 million for 31 loans with maturities of 6-12 months, typically for MK 50,000-60,000. Although the uptake is below the desired level, this is another interesting innovation that helps a bank (and competing banks) to see that there may be opportunities in the dairy and livestock sector for such products.

The ***ESOKO initiative*** under this component requires farmers to register their numbers so that they can receive messages in groups. According to the farmer survey, 34.0% of the sample say they have accessed this service through the MBG, with a higher proportion in Northern Region. The ESOKO platform enables the delivery of generic messages relating to cow husbandry, as well as on other issues such, as health, nutrition and HIV/AIDS directly to registered farmers. ESOKO can also enable more tailored messages such as to farmers of a particular MBG about activity at the MBG – meetings, training, availability of drugs etc. This is potentially a very exciting opportunity for communication. ESOKO is technically enabled with a receive function for incoming messages, such as requests for information. It is understood that this is not currently part of the package.

Land O'Lakes has paid for an initial one year licence and this will pass to the MMPA at the end of the MDDA for them to utilize. It will be important that MMPA thinks innovatively on how to make best use of this opportunity to prove ideas and concepts in this first period. Land O'Lakes report that they will continue to work with MMPA and the three RPAs to develop ideas on how to utilize the ESOKO platform prior to phase out, ensuring there are clear lines of responsibility to ensure the opportunity is utilized.

In conclusion, this is a very innovative idea that came in after the extension was planned as a substitute for Airtel Money that was not possible to implement. Land O'Lakes should take some credit for being responsive and seeing the opportunity.

Finally, this component included fodder and silage management. This was implemented through training. As reported in the findings on the farmer survey, 41.0% of farmers indicated they had received training in fodder management at some point in the life of the MDDA.

 # 4: Number of individuals who have received USG supported short-term agriculture sector productivity training with USG assistance sex-disaggregated

The baseline for this indicator was 5,190 individuals, with a target of an additional 600. The cumulative extension achievement for the first four quarters was 5,218 individuals, of which 2,706 were women and 2,413 were men. This is a 580% achievement of the target and 201% over the baseline.

This was achieved through training in:

- ⇒ Pasture management,
- ⇒ Financial and business management,
- ⇒ Household labor division,
- ⇒ Gender-based business management
- ⇒ Milk hygiene
- ⇒ Co-operative development, and
- ⇒ Human rights for women

As with the other training, the farmer survey found confirmation from farmers that they had been trained in many of these areas, including pasture development (12.5%), finance (9.5%),

business (12.0%), and Co-operative development. For the training in nutrition and milk hygiene, from the MBG Committee interviews, there was a reported mean average of five trainings per MBG since 2009, including a mean average 1.8 trainings in 2011, conducted at nine CBCCs. In total, 31 training courses in nutrition and milk hygiene were reported from these 17 MBGs.

Overall, the data provides confirmation that these training course took place and are recalled by farmers, but cannot measure the impact of these.

The 2012 farmer survey found that the gender gap in roles has narrowed overall, which may be a function partly of the training in household labor division. The discussions with MBG Committees found that six of them have applied for registration as Co-operatives. This is likely to be a direct outcome of the training work, but that is not necessarily the same as having a positive impact on the functionality of the MBGs and the lives of the farmers. That can only be determined in time if Co-operatives out perform other non-co-operative MBG organizational arrangements. That is beyond the scope of this evaluation and of the MDDA program life.

Overall, it was possible to identify that there had been training, but that it was more difficult to identify specific impacts from this. This is partly the nature of training, which does not necessarily have identifiable and traceable impacts.

 # 5: Number of HIV care and support associations provided with economic strengthening capacity building

The baseline for this component was zero, and the target was 12 VS&L groups established for PLWHA. By the end of Qtr 4, 12 VS&L groups have been established for PLHIV. As a result, the target has been met exactly.

In addition to this core of 12 VS&L groups, the VS&L initiative was expanded to non-PLHIV as a result of the success met with PLHIV. More information on the wider application of VS&L is given in 5.2.3. **It is a positive outcome that Land O'Lakes met the target and has expanded VS&L to other categories of farmers in response to interest and demand.**

Table 70: Customized Indicators, MDDA Extension 2011-12

Indicators	Unit of Measure	Direction of Change	Baseline (31 Dec 10)	Target during Ext'n	Q1	Q2	Q3	Q4	Q5	Cumulative for Ext'n
CUSTOMIZED MDDA INDICATORS										
IR 1: Increased number of improved dairy animals available to smallholder farmers										
LLR 1.1: Improved AI services available to farmers										
Number of cows pregnant because of heat synchronization (HS) and AI activity	Cow	+	-	150	n/a	n/a	117	17		134
LLR 1.2: Increased quantity of cows placed with farmers										
Number of additional cows donated to smallscale farmers	Cow	+	-	78	79	n/a	8	63		150
IR 2: Increased access to inputs & services by small scale farmers and MBGs										
LLR 2.1: Improved technical capacity of production service providers										
Percentage of farmers trained by CAHNW and PESPS who have adopted best practices in animal husbandry	%'age (semi-annual)	+	n/a	60.0%	n/a	n/a	77.0%	62.3%		73.4%
LLR 2.2: Improved technical capacity of feed manufacturers										
Volume and value of dairy supplementary feeds	Tons of supplementary feeds purchased	+	252.9	278.2	61.9	58.2	72.0	87.3		279.4
	Value in USD of supplementary feeds purchased (in 000's)	+	$ 70.9	$ 78.0	$ 16.6	$ 15.9	$ 25.7	$ 27.3		$ 85.5
LLR 2.3: Strengthened financial services available										
Number of small scale farmers having *access to* financial services (disaggregated by sex)	Individuals	+	-	2,079	301	628	435	1,403		2,767
	Females	+	-	950	105	283	156	716		1,260
	Males	+	-	1,129	196	345	279	687		1,507
IR 3: Increased profitable production and sale of milk by small scale farmers & MBGs										
Total milk production volume and values	Liters produced (in millions)	+	4.7	5.2	0.8	0.8	0.9	0.9		3.4
	Liters of milk collected by MBGs (in millions)	+	1.8	2.1	0.5	0.5	0.6	0.6		2.2
	Value of liters collected by MBG (USD in 000's)	+	$ 929.2	$ 1,065.8	$ 202.0	$ 208.5	$ 251.3	$ 244.4		$ 906.2
	Liters sold through informal channels (in millions)	-	1.9	2.1	0.3	0.3	0.3	0.3		1.2
LLR 3.1: Improved business capacity of farmers										
Average net income percentage of farmers in 4 targeted MBGs with improved cows producing milk	%'age (semi-annual)	+	42.2%	44.0%	n/a	n/a	64.0%	62.0%		n/a
LLR 3.2: Milk production increased										
Average milk yield for improved cow per day per cow	Liters / day / animal	+	11.5	12.7	11.7	12.4	12.5	12.5		n/a
LLR 3.3: Improved market access										
Volume of milk supplied to dairy processors	Liters of milk collected by MBGs (in millions)	+	1.8	2.0	0.4	0.5	0.6	0.6		2.1
Percentage of milk rejected by dairy processors	%'age (per quarter)	-	0.9%	0.6%	0.8%	0.7%	0.1%	0.1%		n/a

Source: Land O'Lakes Quarterly Reports

5.2 MDDA Indicators

This section reviews the customized MDDA extension indicators set out in the summary

Table 70.

5.2.1 IR 1 Increased Number of Dairy Animals Available to Smallholders

A key component of a growing and sustainable dairy industry is breeding, and this requires access to functioning and effective breeding services.

The MDDA, as part of its Global Development Alliance (GDA) funding, provided grants to several categories of private sector firms and investors, including for establishing and expanding the breeding herd. Under the first phase of the MDDA, six dairy breeders were funded, mainly for increasing their herds through cross-breeds by purchasing initial breeding stock of pure breed bulls and improved local cows (Zebu).[28] Due to the long calving periods, and maturing of heifers, it takes time to build the breeding stock to a level where there are sufficient surplus animals to meet demands. More details are provided in the 2010 AFS.

In addition to interviews conducted in 2010, a meeting was held with grantees on 20th January 2012. Presentations were made by two breeders, namely Peacock Enterprises and Nachali Farms. They indicated how they had been able to build their herds with the assistance of the grant. In the case of Nachali, he had bought a breeding stock of 65 to add to his own stock of
35. From this stock, he has currently has a stock of 170 animals having sold 14 cross-breeds to Bunda College. Peacock commenced with 150 from the grant and now has a total stock of 268 animals, with no sales reported. At this point, neither breeder has sold any animals directly to smallholders, but both, particularly Peacock are producing milk from their herds. Peacock is also a large customer of NICO's cow insurance, helping bring overall rates down but both, particularly Peacock are producing milk from their herds. Peacock is also a large customer of NICO's cow insurance, helping to bring the overall rates down.

From the presentations, there are a number of issues. Clearly, breeding takes time and the breeders want to build their herds before they start selling a lot of animals. However, it was also clear that selling to smallholders directly was proving to be difficult, mainly due to the cost of the heifers and the ability of the smallholders to finance a purchase. This was confirmed by a range of stakeholders, including Lilongwe Dairies (LLD), who offer (partial) loans for purchasing and NBS Bank who have a formal loan scheme. The uptake of the formal loan schemes has been very low. NBS Bank reported two loans for five cows (including one group loan).

The issue was explained by LLD as being affordability, particularly of imported cows, which at MK 300,000 – MK 400,000 were too expensive for most smallholders. As well as the purchase of the heifer, there is the establishment of the Khola,[29] insurance for the animal, treatments/vaccinations and feeding. These are upfront costs and the farmer can only start to recoup these once the heifer has given birth s/he is able to sell some of the milk. In time, the initial investment is covered, but the capital is beyond the capacity of most farmers, and the higher the quality of the original animal, the more capital is required. It is for reasons of capital commitment/affordability and that crosses are more robust within a smallholder system, that Peacock and Nachali indicate that they produce crosses.[30]

The consultant's observation is that while there continue to be regular distributions and pass-ons of heifers, then it will continue to be difficult for breeders to find a market directly with smallholders. Rather they target organizations that are interested in funding the purchase and distribution of animals, as they have the resources for outright purchase. Land O'Lakes

[28] A seventh grant was given to a dairy goat breeder.

[29] The term Kraal is also used, but in Malawi Khola is more common and is the local term.

[30] Land O'Lakes do not recommend getting a loan for a pure bred cow unless a farmer already has three cows as the proceeds from one cow are needed to service a commercial bank loan. Farmers with this many cows may prefer to breed than buy, resulting in limited demand for such loans.

hope that stronger MBGs would start to buy locally bred improved cows and place them with farmers as a re-investment. This has not yet occurred.

The original model of grants for building private sector breeders has assisted in increasing the number of dairy animals in the breeding herd and these are potentially available to smallholders, but it has not yet succeeded in getting these breeder and smallholders to function as suppliers and buyers to each other.

Models for financing dairy cow purchase have also not yet proven successful for the reasons given that are mostly beyond the capacity of the MDDA to address.

At the time of the 2010 evaluation, it was apparent that there were major problems with the supply of liquid nitrogen resulting in a breakdown in AI services that are dependent on it. This was resulting in falling pregnancy rates and resulting falls in milk production.

Having put the breeder grants in place in the early phase of the MDDA, Land O'Lakes has taken a different approach in the MDDA extension. It aimed to train 12 AI technicians and support the RPAs to produce liquid nitrogen. It also contracted GSJ though a matched funding stream to provide heat synchronization (HS) and AI to stimulate pregnancies as a one off boost and work with MMPA on a HS calendar. There were two LLR under this IR:

LLR 1.1: Improved AI services available to farmers

The indicator for this LLR is the 'number of cows pregnant because of heat synchronization (HS) and AI activity'. The baseline for this intervention was zero. The target was 150 cows pregnant through HS/AI activity in seven Central Region MBGs. This was delivered through a contract with GSJ who heat synchronized and inseminated 204 cows.

Land O'Lakes used lessons from the 2009 HS/AI to improve effectiveness. It focused non-USG funds on a smaller number of MBGs in Central Region, as this was easier and cheaper to serve. Land O'Lakes also introduced Malawi's first double HS/AI program to further increase the likelihood that cows would conceive. The lack of liquid nitrogen worked against the initiative, as cows came into heat but could not be served as scheduled. GSJ followed up by getting local AI technicians to continue inseminating as they saw heat signs.

As at the end of Qtr. 4, a reported 134 animals are pregnant, representing 89.3% achievement of the target. It is unclear if this total will be added to, but it appears that the final result specifically through GSJ will fall short of the target as the HS/AI activity has ended. It was not possible to meet with GSJ to clarify why it felt that it had fallen short of the target, but it appears to be a mixture of lack of suitable animals at the time of the exercise and a bigger issue of liquid nitrogen availability. Land O'Lakes tried to address the latter through several orders made through Afrox, but Afrox failed to deliver according to the terms of the agreement. Land O'Lakes even went as far as organizing a truck to collect liquid nitrogen from Lusaka.

HS/AI is not an exact science and it is difficult to guarantee any outcome. Determining the range of success rates, would at least be possible to determine the likely number of inseminations required to reach a given target.

In addition to the GSJ work, Land O'Lakes has been assisting CREMPA and MDFA through training of technicians in AI in earlier phases of the MDDA. The outcome of this work is that these RPAs offer services to members and are inseminating around 100 animals a quarter with an estimate one-in-five success rate. Land O'Lakes calculates that through the GSJ work and the RPAs, 976 cows have been inseminated to the end of Qtr 4. However, only those through the GSJ exercise count towards the target.

The final activity under this LLR is training 12 new AI technicians. Land O'Lakes reports that it working with the Japanese International Cooperation Agency and the MMPA to identify potential technicians from amongst the membership of the associations. The training is expected to be completed on 17th March 2012.

LLR 1.2: Increased quantity of cows placed with farmers

The indicator for this LLR is the 'number of additional cows donated to small-scale farmers'. The extension target is 78 heifers distributed, using matched funds.

Table 71: Dairy Cow Placement, by New or Pass on

Year of Distribution	Distributed		Pass On		Total
	Pure	Cross	Pure	Cross	All
2007	-	-	-	-	-
2008	-	-	-	-	-
2009	175	33	-	-	208
2010	19	4	86	-	109
Sub Total	**194**	**37**	**86**	**-**	**317**
2011	87	-	63	-	150
Total	**281**	**37**	**149**	**-**	**467**

Source: Land O'Lakes

The above table records the split of new distributions and pass-ons over the MDDA amounting to 434, of which 430 have been pure breeds. For the extension, Land O'Lakes has placed 150 animals, of which 87 were pure breeds and 63 high-crosses. 79 Jersey cows were imported and distributed to Central Region MBGs. To the end of Qtr 4, these have produced 56 calves of which 32 are females. These will be passed on in due course. A further eight pure-breed heifers were purchased in Malawi and distributed via Namwiri MBG. Finally, in addition to the new distributions, 63 pass-on heifers from the ongoing pass-on scheme were made, resulting in a 192% achievement rate.

Land O'Lakes changed its approach during the program to purchasing pure-bred animals in the MDDA extension, having seen that Jerseys were better able to cope with the environment than Friesians. Discussions with Land O'Lakes and the RPAs indicate that 10 of the Jersey cows have died post distribution. There were a mix of reported causes, including losses through East Coast Fever. Land O'Lakes is investigating the issue, which is a complex matter and the detail of which is beyond the scope of this evaluation but will be addressed in the MDDA final report.

One interesting change in approach under the extension has been in response to the falling pregnancy rates and a shift in thinking towards a more mixed response other than pure-bred animals. To this end, Land O'Lakes has placed eleven pure bred bulls with MBGs and one private breeding herd as a means to improve the quality of local Zebu cows into crosses. In the long absence of AI services, use of alternative 'traditional' bull services was welcomed by MMPA and CREMPA.

In support of placements, Land O'Lakes has continued to support farmer training in dairy animal husbandry, as recognized in the farmer survey results – 84.0% of farmers accessed this training through their MBG, and 33.0% accessed training in khola/shed construction.

5.2.2 IR 2 Increased Access to Services and Inputs

This component continued earlier work to build the capacity of various service providers to improve access to services and inputs by small-scale farmers and the MBGs. The model used private sector providers wherever possible to build a viable, sustainable and efficient market based dairy service and supply sector.

This was achieved through the following three LLRs.

LLR 2.1: Improved Technical Capacity of Production Service Providers

The indicator for this LLR is the 'Percentage of farmers trained by CAHNW and PESPS who have adopted best practices in animal husbandry'. There was no baseline established for

this indicator, but the target was at least 60% of farmers trained based on Land O'Lakes surveying weighted over the period. Up to Qtr 4, Land O'Lakes reports an achievement of 73.4% which is an achievement of 122.3% of the target.

A number of activities supported achievement of the indicator being development of cost sharing models for four PESPS, support to MBGs to register and function as co-operatives, training in co-operative development and refresher training of 70 CAHNWs.

The support for PESPS included negotiating cost sharing agreements for the PESPS with three MBGs, namely Dzaonewekha, Machite and Namwiri. This involved developing a bonus system for deliveries of milk from the MBG to LLD through identified CAHNWs who would deliver training and extension. The level of support was declining from 100% in two of the MBGs, but with a different pay structure in the other MBG.

The results for Dzaonewekha have been good, achieving the monthly target over a period of six months and resulting in around 10-20% more milk being supplied. The PESP at Machite achieved the target for the first two months, but then a breakdown in the cooling equipment resulted in a shortfall (the MBG is sourcing imported equipment to fix the problem). The Namwiri PESP is salaried and so the bonus structure does not apply.

The feedback through the MBG Committee interviews (see section 4.2) has been positive, recognizing the training and that it has helped in practical terms such as in detecting when cows are on heat. The MBGs also recognize that PESPs and CAHNWs have helped in improving knowledge of khola construction and reduce mortality of animals. They see that there is increased production of milk linked to the training and support of the PESPs to the farmers encouraging them to adopt best practices.

It appears that this initiative has demonstrably resulted in increased production and collections at the MBG and on that basis is a positive result, contributing to the achievement of other targets. The link with training does seem to have resulted in adoption of new practices based on the Land O'Lakes survey work.

For the other activities, related to the PESPS initiative, the CAHNWs have trained 533 farmers (204 women and 309 men) in pasture management. This registered in the farmer survey, with 12.5% of the farmers identifying this training.

In addition, there have been nine training courses for 410 farmers (253 women and 157 men) in business and financial management. As noted in the farmer survey, 12.0% identified training in business enterprise management and 9.5% the training in finance. The MBGs identified better record keeping as one of the outcomes (see section 4.2).

There has also been training in Co-operative Development Program. Land O'Lakes reports that seven MBGs have registered as Co-operatives and one as an Association. In the farmer survey, 17.5% of farmers identified this training.

Overall, these activities have impacted beyond this indicator, particularly in milk production.

LLR 2.2: Improved technical capacity of feed manufacturers

The indicator for this LLR is the 'volume and value of dairy supplementary feeds purchased'. The baseline for volume was 252.9 (metric) tonnes (mT) to a value of $70,900, with a target of 278.2 mT and a value of $78,000. The achievement to the end of Qtr 4 is 279.4 mT to a value of $85,500 equivalent to 100.4% and 109.5% of targets. A surge in demand in the final quarter, which is traditionally a lower consumption period enabled the extension target to be achieved.[31]

[31] The baseline and target are based on the four quarterly totals for 2010, but the extension is for five quarters. Arguably the baseline and target should then have been multiplied up to take account of a five quarter extension rather than being based only on four quarters. Nevertheless, the MDDA has met the baseline and target annual figure over its four quarters.

A key activity in this component was an organized dairy mash feed trial run with CREMPA, Bunda College, DAHLD and three feed manufacturers (Ndatani, Asumi and Transglobe) to test the impact of feed on milk production. There is a separate report on the feed trial findings with data analyzed by experts at Bunda College. The findings were shared at a farmer field day at Chitsanzo, attended by 450 farmers. The data shows that the feed has increased production. This approach of using systematic trials and then sharing the results appears to have increased understanding of the benefits of feed at the MBGs. Interestingly, it has also put pressure on the feed suppliers to prove their product and at times has generated considerable debate.

The feed trials and accompanying focus may have also improved the general quality of feeds as the manufacturers' products came under more obvious scrutiny. In response to issues raised, Ndatani has opened a depot in Mzuzu that was commented on by the MBGs, many of whom buy feeds from Ndatani. In the previous evaluation, interviews with Ndatani and Transglobe (and other input suppliers), highlighted the issue of poor payment by the MBGs, It is not clear if this issue has been addressed with the surge in demand, otherwise, this may result in increased debts to the suppliers.

The promoting of feed has also been done through the ESOKO SMS. For example, 750 farmers got messages about the feed trial open day. The use of feed has been included in training in business and finance, in order to demonstrates the net value of feeding on production and profits.

The evidence from the farmer and MBG surveys supports this data, with higher expenditure on feed reported in both the household expenditure and in the analysis of the dairy enterprise (see sections 3.4.3 and 3.4.5). In Central Region where spending on livestock inputs and feed are higher than Northern Region, has also recorded higher production at over 2 liters per cow (see section 3.6). This issue is returned to in LLR 3 below.

LLR 2.3: Strengthened Financial Services Available

The indicator for this LLR is 'Number of small scale farmers having access to financial services (disaggregated by sex)'. The baseline is zero, with a target of 2,079 individuals reached. The achievement to the end of Qtr 4 is 2,767 individuals reached (1,260 women and 1,507 men) representing 133.1% of the overall target, 132.6% of the target for women and 133.5% of the target for men.

The activities under this LLR were planned to be the Airtel Money,[32] NBS Bank loan scheme for buying cows, NBS Bank insurance loan scheme, promotion of NICO livestock insurance and mobile banking service provision.

The substitution of ESOKO for Airtel Money has been discussed under indicator three of the USAID operational indicators (see section 5.1). Details on the NBS Bank cow loans, insurance loans and mobile banking service have also been covered in the same section.

In addition to the planned and amended activities, Land O'Lakes has included its VS&L initiative in this section, which is appropriate given the focus of the LLR. As noted in section 5.1, under indicator #5 (for PEPFAR), the initial work to establish 12 VS&L groups for PLWHA was expanded to other farmers not in this category, due to the considerable interest shown. In addition to the 12 groups, Land O'Lakes has now assisted in establishing 29 more VS&L groups for MBG members. These VS&L groups have 725 members (women 454, men 271) across 10 MBGs in both Central and Northern. In practice, there have been more groups and members in Northern totaling 481 members and 244 members in Central Region. This initiative is confirmed by the farmer survey, which found 11.0% of farmers stating that they had been trained, with a bias towards Northern with 13.1% of farmers saying they had been trained compared to 10.1% in Central. Overall, the reported savings are US $5.7k.

[32] Formerly this product was called ZAP, when Airtel Malawi's operations were under Zain

The MBG Committees have recognized this initiative and welcomed it and verified that some members had been able to access loans, as well as savings.

Land O'Lakes reports that it has trained 25 master trainers so that the VS&L model can spread. **VS&L is a well-received and useful addition to the original activities and has contributed substantially to achievement of the target.**

5.2.3 IR3 Increased Profitable Production and Sale of Milk

This IR focuses on the increased and profitable sale of milk by small-scale farmers and MBGs. Its overall focus is on 'Total milk production volume and values'. This will be achieved through three LLRs.

Total Milk Production Volume and Value

MDDA has included production targets from the outset and these are reported on extensively in the 2010 evaluation. The production targets have four elements: Total liters produced, Liters collected by MBGs, Value of liters collected and Liters sold through informal channels.

The baseline for the MDDA extension for liters produced is 4.7 million liters, which reflects the production total for 2010. The target for the extension is 5.2 million liters. The achievement to Qtr 4 is 3.4 million liters, representing 65.9% of the target and 72.8% of the baseline.

The baseline for the MDDA extension for liters collected by the MBG is 1.8 million liters, which reflects the total for 2010. The target for the extension is 2.1 million liters. The achievement to Qtr 4 is 2.2 million liters, representing 104.2% of the target and 119.5% of the baseline.[33]

The baseline for the MDDA extension for the value of milk collected by the MBG is $929.2 thousand, which reflects the total for 2010. The target for the extension is $1,065.8 thousand. The achievement to Qtr 4 is $906.2 thousand, representing 85.9% of the target and 97.5% of the baseline.

The baseline for the MDDA extension for ltrs sold through informal channels is 1.9 million ltrs, which reflects the total for 2010. The target for the extension is 2.1 million ltrs. The achievement to Qtr 4 is 1.2 million ltrs, representing 55.9% of the target and 61.8% of the baseline.[34]

From the data above, Land O'Lakes has achieved the target for collections by the MBGs. The consultant interprets the fourth target for sales through informal channels to be an inverse target where undershooting the target and baseline is the desired outcome. On this basis, the fourth target has been achieved, though arguably the target should have been set as a reduction of the baseline not an increase over it.

However, the MDDA has not achieved the target for production or for the value of sales to MBGs, even though it did achieve the volume of sales to MBGs target.

The data in Land O'Lakes quarterly reports expand on the production issue. The 2010 evaluation wrote extensively on the issue of production and how data was collected and used. One of the positive changes in the period from 2010 has been the introduction of a production survey using a standardized collection method. Although there are some sampling issues, this is a relatively robust method of collection and far superior to the methods used prior to that, which found dramatic and inconsistent swings in production.

[33] There is a rounding error in the percentages, as the figures are entered into the data sheet already rounded rather than entering the precise figures. This accounts for slightly differences in the results.

[34] The target for this indicator is for an increased level of sales through informal channels, whereas the desired direction of change is negative, suggesting that 'under-achievement' below target and baseline is desired.

The outcome of the production survey is that it showed falling production in 2010 from a starting position of around 1.2 million liters to around 0.8 million liters. At the time of the 2010 evaluation, it was clear that the breakdown of AI service[35] was having a negative effect on production, as farmers were less able to get their cows pregnant. This effect has indeed worked its way through to production levels.

Since 2010, Land O'Lakes has engaged in a number of initiatives to assist in rebuilding the AI system and encouraging production. Although the overall data shows a large shortfall in production against both the baseline and the target, the quarterly data shows that the production fall leveled off at 0.8 million liters for quarters 1 and 2 and has begun to rise in quarters 3 and 4 to 0.9 million liters. It is too early to determine if this modest upswing will pick up, stay the same of fall away.

An early indication would be to look at cow pregnancy rates. In the absence of those, the next best proxy is to see what has been done to re-establish the AI system. The work of Land O'Lakes in this respect has already been reviewed under LLR 1 above. This found that there were several useful initiatives that were increasing pregnancies. In addition to these initiatives, there has been support from other sources for small (5 Ltrs/day) liquid nitrogen machines for the three RPAs. The CREMPA machine broke down, and Land assisted in sourcing imports of liquid nitrogen, which proved challenging. The volume of these three machines is being supplemented by a larger liquid nitrogen machine (40 Ltrs/day) that has been bought by MMPA with finance from matching funds and a commercial partner (LLD). This will significantly increase the amount of liquid nitrogen available for AI services and over time enable the rebuilding of these services. It is a major positive step to not only re-establishing AI services, but also entrenching it outside the government, which has consistently failed to provide the service required of it as the monopoly supplier. The machine will be imported towards the end of the extension, becoming fully operational post the close out of MDDA.

The development of complementary bull services has helped, and in many ways this may be a useful 'insurance policy' against future problems. The training of PESPS and CAHNWs is also necessary, and the initiative with GSJ has also helped to provide a timely boost. However, the scale of the problem was greater than MDDA's capacity to respond, hence the decline in production prior to it leveling off**. It appears that MDDA activities have helped to arrest the decline in production and its more recent increase.**

Looking ahead, the work on feed has the potential to boost production and the indications from the last quarter (Qtr 4) that volume of sales has increased is indicative of an improvement to come and perhaps that farmers have understood the value of feeding.[36]

In relation to sales to the MBGs, this is a key measure as it is important for the sustainability of the whole dairy system that the MBGs function and are viable. To do this, they need to be collecting larger volumes of milk. This also helps them to become a focal point for support to dairy farmers and that in turn encourages more milk to be produced and delivered. The success in meeting the volume target is very positive in the light of static production. This suggests that MBGs have increased their share of the milk collections since the volume of collections is higher than the baseline and production has fallen by 25-30%. This is also more creditable given the continued difficulties in Northern Region with the final collapse of NDI, which was the only processor in the region until recently.

That the collections for the MBGs increased is probably attributable to a range of factors. Some of these are the production initiatives that Land O'Lakes has been promoting, such as the work of the PESPs and CAHNWs, including the incentivizing of PESPs at three MBGs. It

[35] This was mainly due to the breakdown of the liquid nitrogen plant that government operates and its failure to get it repaired. It has been broken for in excess of two years.

[36] According to Land O'Lakes, 11 of the 12 heifers in the feeding exercise are now pregnant. It is unclear if the feeding contributed to this level of pregnancies, but it is known that pregnancy is aided by good feeding.

is also likely that the range and extent of training has had an impact on farmers, not just in their operations, but also their motivation in selling to the MBGs. One very strong finding from the farmer survey was the high level of response confirming participation in one or more of the many training courses. For example, 84.0% said that they had received training in looking after dairy animals.[37]

Although the volume of milk collected by MBGs was increasing and over target, the value of those collections declined. It is not clear why, but the farmer survey showed on a small change in MBG prices to farmers of around MK 3-4, which is about 5-6%. At the same time, there was a devaluation of the MK against the US Dollar of around 10% at the end of August 2011. This would have the effect of reducing the dollar value of the milk collected. With inflation effects and another likely very large devaluation in the coming months, the farmers will start to feel the pressure unless MK prices are increased, which is something that the MMPA is pushing for.

The final indicator of sales to the informal sector is substantially below the target and baseline, which is what is desired (contrary to the targets set). However, the drop in informal sales volume is also linked to the fall in production. The achievement of the MDDA is that it is the informal sales that have fallen, while sales to the MBGs have increased marginally. The data for this indicator is collected by survey, so can be subject to error, but if the sales to informal sources were to rise, and the proportion remain the same, this would indicate an increase in production which would improve MDDA performance on its first indicator. Overall, the decline in sales to the informal sector is welcome, and is probably partly linked to the various initiatives in and around the MBGs that MDDA has been promoting.

LLR 3.1: Improved Business Capacity of Farmers

The indicator of improved business capacity of farmers is 'Average net income percentage of farmers in four targeted MBGs with improved cows producing milk'. The baseline is 42.2% and the target is 44.0%. Although the increase in percent appears small, the actual percentage increase is 44.0 minus 42.2 % divided by 42.2%. This equates to an increased net real income of 4.3%. If achieved, it would be a significant improvement.

According to the quarterly reports, the achievement was only measured in Qtrs 3 and 4, and is recorded at 64.0% and 62.0% respectively. This is a substantially better performance than planned. It is possible that since this is a new indicator and it is not easy to measure costs, that the original baseline and hence the target underestimated the actual performance at the outset. That would seem to be the most likely explanation, otherwise net income would have increased by over 50% which appears unlikely in the absence of a major change in price or a major fall in costs.

The decline between the third and fourth quarters is attributed to an increase in production costs with a static price. That explanation mirrors the data in the farmer survey, as do the relative amounts being spent on inputs, notably feed. Of course, an increase in the volume of feed should also increase production and if the right amounts are being used, then this should lead to an increase in net income. Training farmers in getting the right balance between extra feed and extra production and net income is a very important part of any business training, which is something that is being done at the four target MBGs (410 farmers as indicated earlier). It would be useful to continue to track these margins and identify the particular factors that are impacting on them, being costs, production levels and/or price of milk. This better understanding of the linkages will help the farmers and also the MBGs to advise other farmers on the best combinations.

LLR 3.2: Milk Production Increased

The indicator for milk production increased (LLR 3.2) is 'Average milk yield for improved cow per day per cow.' The baseline is set at 11.5 Ltrs/day and the target in the extension is 12.7

[37] This is presumed to be over the recent past rather than strictly within the last 12 months.

Ltrs/day. Based on Land O'Lakes production survey, the achievement by Qtr 4 is 12.5 Ltrs/day, which has increased from 11.7 Ltrs/day in Qtr1.

Data for production are collected from 15 MBGs across Northern and Central Regions. The range in the latest quarter is from 8.5 Ltrs/day at Namwiri to 15.9 ltrs/day at Machite. Land O'Lakes observes that production has tended to be higher at larger MBGs, attributing this to the availability of services and also the capacity to keep the collection (bulking tanks) functioning. A similar observation was made in the 2010 evaluation, with a recommendation to focus on larger MBGs that have achieved critical mass. The other trend is that Central Region MBGs (13.3 Ltrs/day) have higher production than Northern Region (11.4 Ltrs/day).

The 2012 farmer survey covers a slightly larger sample, across 17 MBGs (see Table 38), but only measures production on the previous day, compared to a month long collection in the Land O'Lakes production survey. The overall mean for all breeds and across both regions was 10.70 Ltrs/day. Central Region recorded a higher mean (11.27 Ltrs/day) than Northern Region (9.19 Ltrs/day). The production level for pures was 11.17 ltrs/day and for crosses it was 8.83 ltrs/day in the farmer survey.[38] These findings broadly support the Land O'Lakes data and are within the standard deviation.

Although the difference in means between the farmer survey and the Land O'Lakes production survey are 1.6 Ltrs/day apart, the pattern of production across the regions is very similar. The difference can be accounted for by a greater mix of breeds in the farmer sample (including more crosses) and different sampling methods. The Land O'Lakes' method involves more regular collection over a month, and so is likely to be more accurate, though it carries a greater bias in animal selection. It is important to be clear that the farmer survey findings do not contradict the Land O'Lakes production survey findings and are within an acceptable range, based on the standard deviation.

The result is that productivity appears to have improved and is close to the target prior to the final Qtr results.

LLR 3.3: Improved Market Access

The indicator for improved market access (LLR 3.3) is 'Volume of milk supplied to dairy processors' and 'Percentage of milk rejected by dairy processors.'

The baseline for volume of milk supplied to processors is set at 1.8 mLtrs with a target of 2.0 mLtrs. The achievement by Qtr 4 was 2.1 mLtrs, representing 103.7% of target and 118.3% of the baseline.

The baseline for percentage of milk rejected by dairy processor is set at 0.9% with a target of 0.6%. Although a small percentage point difference of 0.3%, this is actually an improvement by 33% if the wastage reduces from 0.9% to 0.6%. The reported achievement in the last two quarters has been 0.1%, which is a significantly over-achievement of the target and improvement on the baseline.

Interviews with the MBGs found a slightly different picture. After several years with low rejections at around 0.2%, this is reported to have increased to 0.7% in 2011. The mean disguises several MBGs with reportedly much higher rejection rates, such as Kapacha, Magomero, Gondoli and Mponela, all of which are above 1%. Any initiative to address the rejection rate, would therefore need to focus on the MBGs that are reporting relatively high figures. Al the others are well below the target percentage.

Although MBG data gives a mean slightly above the target for the MDDA, it is difficult to say that the data contradict the Land O'Lakes figure, as the survey covers 17 MBGs and the Land O'Lakes data covers all 23 MBGs. The situation is also volatile due to increasing power cuts and difficulty getting spare parts for equipment, due to persistent forex shortages.

[38] Based on primary animal only – farmers recorded the best performing animal first.

Although some MBGs have their management problems, the dominant issue in the last 12 months has been the collapse of NDI and the problems facing MDI in payments to MBGs. The latter issue may now improve as MDI is accessing a loan to improve its cash position, though some of its MBGs have decided to move to LLD, which will give MDI a new problem.

Looking to the future and sustainability, MDFA has now become a small-scale processor and with Land O'Lakes' support has been collecting from a number of MBGs to fill part of the gap left by NDI. LLD has near doubled its processing capacity and continues to increase its intake according to what supply is available.

Overall, the environment has been challenging, which makes the achievement of the delivery target a creditable performance.

On the quality target, the low level of rejects is encouraging and very important for MBGs as the spoilage or rejection of milk is a major loss to farmers. In the light of ESCOM power outages and difficult transport arrangements due to the fuel, this is also a creditable performance. As Land O'Lakes indicates, there does appear to be a more serious approach to quality and ensuring equipment is working and intake quality better monitored.

Table 72: PEPFAR Indicators, MDDA Extension

Indicators	Unit of Measure	Direction of Change	Baseline (31 Dec 10)	Target during Ext'n	Q1	Q2	Q3	Q4	Q5	Cumulative for Ext'n
CUSTOMIZED MDDA INDICATORS										
CIR-HIV/AIDS & OVC: Individual mechanisms strengthened to mitigate and cope with the impacts of HIV/AIDS										
CLLR-P1: Improved HIV/AIDS behavior change strategies in place										
Total number of individuals trained in HIV prevention education	Individuals	+	2,696	6,019	1,677	3,943	3,138	3,112		11,870
	Females	+	n/a	n/a	1,142	2,573	1,937	1,734		7,386
	Males	+	n/a	n/a	535	1,370	1,201	1,378		4,484
Total number of HIV prevention education sessions conducted	Number of sessions	+	89	51	43	83	58	54		238
CLLR-P2: Improved services available to OVC through community resources										
Total number of additional OVC support centers receiving milk	Number of CBCCs	+	25	2	0	1	0	1		2.0
Total number of OVC served by MBG-implemented HIV activities	Number OVC	+	2,245	600	228	365	525	85		1,203
Number of liters of milk donated to OVC support programs	Liters of milk (in thousands)	+	8,996	9,000	1,966	1,223	1,007	1,243		5,439
Total number of people trained in nutrition	Individuals	+	527	375	24	349	0	16		389
	Females	+	n/a	n/a	15	259	0	9		283
	Males	+	n/a	n/a	9	90	0	7		106
CLLR-P3: Strengthened economic capacities of PLHIV										
Total number of people trained in economic strengthening activities	Individuals	+	-	240	85	57	96	71		309
	Females	+	-	n/a	63	24	62	39		188
	Males	+	-	n/a	22	33	34	32		121
Total number of VSL groups established	Number of groups	+	-	12	4	2	3	3		12
Amount of cumulative value savings by VSLs	Total savings in USD	+	$ -	$ 960	$ 230	$ 1,261	$ 4,586	$ 213		$ 6,290
CIR-Gender: Strengthened equality between men and women within households										
CLLR-G1: Financial empowerment of women strengthened										
Number of women receiving CDP training	Individuals	+	-	250	-	-	-	253		253
Number of women receiving human rights training	Individuals	+	-	300	-	-	328	-		328
CLLR-G2: Dairy farming responsibilities between men and women more equally shared										
Survey conducted	Report	+	n/a	1	n/a	n/a	n/a	n/a		-
CIR-Environment: Strengthened mechanisms in place to prevent negative environmental impacts by the dairy industry										
CLLR-E1: Increased number of private sector stakeholders complying with environmental checklists										
Percentage of smallholder dairy farms passing the MDDA environmental compliance test	%'age (semi-annual)	+	n/a	75%	n/a	87.4%	n/a	89.8%	n/a	n/a
Percentage of MBG cooling facilities passing the MDDA environmental compliance test	%'age (semi-annual)	+	n/a	75%	n/a	76.4%	n/a	88.8%	n/a	n/a

5.3 Cross-Cutting Indicators

This section reviews achievement on Cross-cutting Intermediate Results (CIRs) and Cross-cutting Lower Level Results (CLLRs).

5.3.1 CIR 1 HIV/AIDS and OVCs

This CIR seeks 'Individual mechanisms strengthened to mitigate and cope with the impacts of HIV/AIDS.'

HIV/AIDs has had a devastating impact on Africa and continues to undermine the productive lives of dairy farmers and their communities. There are three CLLRs under this CIR.

CLLR-P1: Improved HIV/AIDS Behavior Change Strategies in Place

Under this CLLR, the indicators of achievement are 'Total number of individuals trained in HIV prevention education' and 'Total number of HIV prevention education sessions conducted'

The first indicator is the same as PLLR1 (see section 5.1) and has been reported.

The second indicator is related to the first indicator recording the number of HIV preventative education sessions. The baseline line is 89 and the target is 51. By the end of Qtr 4, the achievement was 238, which was 466.7% of the target.

This has been an important area of focus for the MDDA, and it has consistently ensured the delivery of training to MBGs and their farmer communities. The use of partner organizations and master trainers has been a key factor in reaching the targets. This is an efficient method.

CLLR-P2: Improved services available to OVC through community resources

Under this CLLR, there are four indicators of achievement for improved services available to OVCs through community resources, namely:

1. Total number of additional OVC support centers receiving milk
2. Total number of OVC served by MBG-implemented HIV activities
3. Number of liters of milk donated to OVC support programs
4. Total number of people trained in nutrition

The baseline for the total number of OVC support centers receiving milk was 25, with a target of 2 CBCCs. By quarter 4, the target of 2 had been achieved.

The baseline and target for total number of OVCs served by MBG implemented HIV Activities is the same indicator as PLLR 2 and is reported above.

The baseline for number of liters of milk donated to OVC support programs is 8,996 liters with a target of 9,000 during the extension. By Qtr 4, the achievement was 5,439 liters or 60.4% of the target. Part of this is due to decreased milk production that MBGs experienced during the extension period

The baseline for the number of people trained in nutrition was 527, with a target of 375. The achievement to end Qtr 4 was 389 people (283 women and 106 men) representing 103.7% of the target.

The first indicator has already been reported on under PLLR 2. As indicated, the MBGs have been progressively increasing the supply of milk donated to CBCCs. For the target of 9,000 liters, the MBG Committee interviews reported a mean of 476 liters/MBG across 17 MBGs, totaling 8,089 in 2011. **This has increased over the last three years and is higher than the data reported by Land O'Lakes, even though it does not include six MBGs. It therefore appears that Land O'Lakes may be closer to achieving the target by project end than it has reported.**

CLLR-P3: Strengthened economic capacities of PLHIV

CLLR-P3 to strengthen the economic capacities of PLHIV has three indicators:

1. Total number of people trained in economic strengthening activities
2. Total number of VS&L groups established
3. Amount of cumulative value savings by VS&L (group)s

The baseline for the total number of people trained in economic strengthening activities is zero with a target of 240. The reported achievement by end Qtr 4 is 309 (women 188, men 121), representing an achievement of 128.8%.

The baseline for the total number of VS&L groups established is zero, with a target of 12. The achievement by end Qtr 4 is 12 representing 100% achievement.

The baseline for the amount of cumulative savings is zero, with a target of US $960. Achievement is complicated by the payouts of accumulated funds usually near the calendar year-end, as is common with VS&L mechanisms. These payouts come at a time of need for farmers for inputs and the hungry season, making them very useful to the farmers.

As at the end of Qtr 4, the cumulative amount saved was $6,290. The consultant's view is that the indicator should not have been framed as cumulative, but as a mean average quarter end balance of savings, since the savings balance is a 'stock/point' figure. Based on the cumulative amount, the savings, the achievement is 655.2% of the target, but even using the average balance method, the average quarter end balance is US $1,572.50, which is still 63.8% above target.

This result area is related to that reported as PLLR 5.

The VS&L model appears to be having high acceptance and is a good vehicle for achieving this result area.

5.3.2 CIR-Gender: Strengthened Equality between Men and Women within HHs

This result area seeks to improve the equality of men and women within the households, which is often imbalanced in rural Malawi. This result area has two lower level result areas:

CLLR-G1: Financial Empowerment of Women Strengthened

CLLR-G1 has two indicators being: 'Number of women receiving CDP training' and 'Number of women receiving human rights training'.

The baseline for number of women receiving CDP training is zero, with a target of 250. By the end of Qtr 4, the achievement was 253, which was 101.2% of the target.

The baseline for the number of women receiving human rights training was 300. By the end of Qtr 4, the achievement was 328, which is an achievement of 109.3% of the target.

Land O'Lakes adapted the CDP course to be specifically a gender-based business course for women. Its impact will be assessed in the gender study conducted in Qtr 5, and outside the scope of the evaluation SoW.

CLLR-G2: Dairy Farming Responsibilities between Men and Women more Equally Shared

The indicator for this CLLR is that a Gender Survey would be conducted, looking at roles within the dairy enterprise. This study has been conducted and the report is pending, due close to the time of publication of this overall evaluation. The study will also inform how far the training has impacted gender roles, decision making and access to resources.

In support of this CLLR, Land O'Lakes has regularly conducted gender (refresher) courses for men and women on roles within the dairy enterprise. So far, 498 people have been trained (241 women and 257 men).

The issue of gender roles in the dairy enterprise was covered in the farmer survey and is reported in section 3.4.5. In summary, more women (96.5%) reported being involved in the

dairy enterprise than men (87.5%), with less involvement of men (73.8%) in Northern Region relative to Central Region (3.5%). Although women in Northern Region were more involved than men at all levels (partly reflecting their much higher ownership levels), in Central Region men (58.3%), were more likely to be involved full time than women (39.6%). 25.2% of women in Central reported having relatively little involvement compared to only 6.5% of men saying the same thing. These findings on gender may also explain why more men were encountered in Central Region at the MBGs, compared to the expected proportions based on stated ownership. It appears that the ownership is probably more commonly with the husband than officially stated.

The above raises several gender issues. The first is who owns the animal followed by what is the agreement and arrangements for its care and for sharing income. It would be a concern if women are unable to own an animal, or if given it, that the husband then effectively takes control of it. If the husband also expects the wife to work in caring for the cows, then this appears to be a case of gender exploitation. It could be that it is the man's role to deliver the milk, for a mix of physical and cultural reasons.

In Central Region, it does appear on face value that although women are the registered owners in the majority of cases, but some men may be acting as if they are the owners. At least in many cases, the women are not being required to provide much input (see Table 62). This limited input by about one quarter of women, provides some support for the possibility that some men behave as the actual owners, even if the wife is the registered owner

In Northern Region, the reverse appears to be the case, with women as the owners and the main workers, with men taking relatively less interest. If the woman is able to keep the proceeds of her ownership and work, then this is less of an issue. If the husband gets the proceeds, then it is. The gender survey will shed more light on these issues.

5.3.3 Strengthened Mechanisms to Prevent Negative Environmental Impacts

This CIR on Environment seeks to strengthen mechanisms to prevent negative environmental impacts. It is achieved through one CLLR:

CLLR-E1: Increased Number of Private Sector Stakeholders Complying with Environmental Checklists

This result requires measuring two indicators, namely: 'Percentage of smallholder dairy farms passing the MDDA environmental compliance test' and 'Percentage of MBG cooling facilities passing the MDDA environmental compliance test'.

No baseline for either indicator was available and the target was set at 75% of the required environmental regulations in both cases. For the first indicator (percentage of farmers passing the environment compliance test) the achievement as at Qtr 4 was 89.8%, which is approximately 20% over the target. For MBG facilities, the achievement as at Qtr 4 was 88.8%, which is also about 20% over the target.

Details of the activities and performance are in the semi-annual report for December 2011. The report outlines activities in support of these indicators, being:

1. Training of all farmers that receive animal placements as original distributions as well as through pass-on.
2. Milk hygiene training, reaching 248 people, including 114 women and 134 men covering milk handling and hygiene.
3. Training in safe handling of chemicals, for 945 people (429 women and 516 men).[39]

The relative compliance over the last three years is set out below:

[39] Dairy requires a number of potentially harmful chemicals, such as acaricides which need proper measurement for use, care in applications, prevention of run off and proper disposal.

Table 73: Environmental Compliance Levels

Environmental Compliance Indicator:	2009	2010		2011	
	Q4	Q2	Q4	Q2	Q4
	%	%	%	%	%
Percentage of smallholder dairy farms passing MDDA environmental compliance test	34.0	76.7	90.6	87.4	89.8
Percentage of MBG cooling facilities passing MDDA environmental test	6.0	66.7	75.0	76.4	88.8

Source: Land O'Lakes Bi-Annual Environment Compliance Report

The above table shows steady progress to high levels of compliance in excess of the 75% targets. The trend suggests that it ought to be possible to target over 90% compliance in future.

The percentage of dairy farms is calculated using the number of farmers visited and checked for compliance using the smallholder farmer environmental checklist from the MDDA Environmental Manual. During the period July to December 2011, 217 smallholder farmers at 18 MBGs were randomly visited. MDDA staff conducted participatory spot checks of farms to assess compliance to the environmental requirements under the program. Of the 217 smallholder farms visited, 195 passed (89.8%).

Cumulatively, 926 smallholder farms have been visited in 1,138 visits:

Table 74: Cumulative Farm Environmental Compliance Visits Since 2009

Cumulative farm visits	Total # visited	Number passed	Pass percentage
Visited Once	926	683	74
Visited Twice	150	125	83
Visited Thrice	53	52	98
Visited four times	9	9	100
Total	921	674	73

Source: Land O'Lakes Bi-Annual Environment Compliance Report

For the percentage of MBG cooling facilities that pass the MDDA environmental compliance test, compliance is defined as getting at least 75% of the required environmental regulations outlined in the MDDA environmental manual. In the last reporting period, 18 MBGs were visited of which 16 MBGs passed the test (88.8%).

The table below shows the details of the how each MBG scored:

Table 75: MBGs Meeting Environmental Compliance Levels

Name of MBG	Number of Checks passed	Pass rate (%)
Magomero	**10**	90.9
Mponela	**9**	81.8
Chitsanzo	**11**	100.0
Kapacha	**9**	81.8
Namwiri	**10**	90.9
Dzaonewekha	**10**	90.9
Machite	**9**	81.8
Gondoli	**10**	90.9
Kavuzi	**11**	100.0
Mpalo	**9**	81.8
Chakhola	**8**	72.7
Kawindula	**10**	90.9
Lusangadzi	**9**	81.8
Doroba	**9**	81.8
Lukonkhowe	**9**	81.8
Likuni	**10**	90.9
Mpasa	**7**	63.6
Lumbadzi	**9**	81.8

Source: Land O'Lakes Bi-Annual Environment Compliance Report

The above results suggest that there has been a significant improvement in compliance by farmers and MBGs over the life of the MDDA.

6 Lessons and Recommendations

This section covers lessons and pulls together earlier recommendations as well as making additional recommendations.

6.1 Lessons

6.1.1 Key Risk Factors

The breakdown of AI services resulted from the failure of Government of Malawi's (GoM's) liquid nitrogen plant at Mikolongwe Research Station. This has had significant knock on effects for the dairy sector, through the breakdown of AI services, fall in pregnancy rates and subsequent fall in milk production during the second half of 2010 and the first half of 2011.

The dependence on GoM, or any other supplier, as the sole provider of this key input was a significant risk factor for the dairy sector and therefore for the MDDA Program, as noted in the Performance Management Plan. The plant at Mikolongwe has broken down before, but this time GoM was unable to get it repaired, either through lack of resource, lack of will and/or the nature of the breakdown.

The positive outcome is that there has now been investment in three mini-plants that produce four to five kgs/day and are run by the three RPAs. These have provided some relief, but insufficient to re-establish functioning widespread AI services. Finally, with matched funds facilitated by Land O'Lakes and a loan from LLD, a larger plant (40 kgs/day) is being imported and will be established with the MMPA. This will have the capacity to supply a much greater portion of the liquid nitrogen needs in a quasi-commercial manner. It will provide considerable security for the dairy sector going forwards and shift the sector further from public towards private provision of key services.

The hiatus has been very damaging for the dairy sector, from AI technicians through RPAs (that are involved in service provision), to farmers and processors through the subsequent fall in milk production. It also impacted the MDDA, which has production as a key indicator. The wider stakeholders have now addressed this with Land O'Lakes input, but for the MDDA it is too late to restore the lost production, which is one of its important indicators.

A second key risk factor that came to pass in the MDDA extension period was the final breakdown of marketing arrangements in Northern Region, with the closure of NDI and its ceasing to buy from Northern MBGs. NDI had been on a clearly deteriorating trend for some years, and so Land O'Lakes offered them the services of a marketing consultant, which they turned down. The problems of NDI went well beyond marketing, such as its financial strength to keep its plant running and paying MBGs. Once it started delaying payments to MBGs, then MBGs found it difficult to pay farmers, resulting in farmers seeking other buyers who would pay. This resulted in the informalization of the market and the heavy reliance on direct sales or sales to vendors. It would have been difficult to predict the timing of the final breakdown of NDI, but it did appear inevitable, based on interviews for the evaluation in 2010.

MDFA has been assisted by MDDA to partially fill the gap through support to it as a dairy processor, though its plant is processing only around 1,000 liters/day, well short of the available supply. It is unclear at this point if MDFA will be able to increase its collections and process and market the milk. Based on its presentation at the grantee meeting on 20 January 2012, it still has limited technical and processing capacity, and appears highly dependent on external support to see it through this period.

The collapse of NDI and the resulting breakdown in marketing arrangements impacted negatively on the MDDA. Land O'Lakes sought to assist NDI and MDFA. In the latter case, there have been measures like assistance with transport and collections. These are helpful, but the scale of the problem has been greater than the resources.

Identifying key risks and practically mitigating against them, or resolving them is a difficult matter and it is not the sole or even joint responsibility of the MDDA. Risks were identified and Land O'Lakes responded to these, which required considerable additional management and input beyond its planned activities. Land O'Lakes should get credit for adding this role to its activities. However, given the likely impact on the MDDA from these relatively predictable risks, the MDDA could have included more activities in the extension to address these dual risks. The consequence of the risks coming to pass has been a shortfall in the MDDA meeting key targets, with production still around 25% lower than reported in early 2010.

It is recommended that:

Land O'Lakes and successor dairy programs undertake continuous risk assessments for the success of dairy projects around key services and marketing, building activities into proposals that fully anticipate these risks and in response to these, and that allow them to respond flexibly as events unfold.

6.1.2 Use of Evidence

One of the many positive factors about the MDDA has been the work on feed trials, with a desire to bring a much more strongly evidence based approach to the bear.

There has been debate about the use of different dairy husbandry models particularly for smallholders. It is well-known that pure-bred animals need a good quality feeding regime to get the levels of production that they are technically capable of, but which are not being commonly achieved in the Malawi smallholder dairy sector.

Improving the availability of better quality feed was part of the rationale behind the MDDA grants to private sector firms, including a number of feed manufacturers. This resulted in supply gains and some increase in feed uptake, but not the dramatic lift off that appeared to be around the corner. Although supply was improved, the demand by smallholders was still limited. The reasons for the lack of demand were a mix of poor understanding of the value of feeding by smallholders, the relatively high cost of feed, which has to be paid for in advance of the productivity gain (and related income gains), availability of feed at MBGs (partly due to poor payment track records in the past), proper technical recommendations on use[40] and perception (and actuality) of mixed quality of feeds in the system. All of these factors, and perhaps others, need addressing if there is to be a sustained increase in feed demand.

The initiative of MDDA to identify the need and opportunity for feed trials, with proper establishment, monitoring and dissemination was a very good step in addressing the feed questions that existed. There was a sense of the feed manufacturers being under pressure to prove their case. Some raising of the temperature of the debate around this issue, was probably a necessary step to move things forward and a sign that progress was being made.

The feed trials were professionally conducted and documented, with the results promoted in a very useful farmer event. Land O'Lakes also worked with the feed manufacturers and Bunda College of Agriculture to develop a new recommended feeding rate.

The feed companies, with hindsight might recognize that this process has brought more focus on the issue of feed and that this may have been a factor in the unusually demand experienced over recent months for feed though drawing attention to the value of feed. This trend may not necessarily be sustained, but the evidence from the farmer survey was that feed and other livestock inputs are now a major part of the household budget and dairy enterprise costs.

This type of process is something that should be repeated with a follow up on feed and other dairy inputs. The trials could be repeated periodically with a range of different parameters

[40] The 2010 evaluation identified concerns by several stakeholders and the consultant over the incorrect recommendations by feed suppliers on usage rates, as well as concerns over the variability of the products available.

each time, both for genuine research purposes, but also for informing farmers of what is the best method. The feed trials could also be extended to look at different feed models, such as low input models (bran 'madeya' based) for lower quality animals to determine the returns to feeding, as it is not just a production matter, but should be just as much, if not more, an economic and business calculation as to what regime gives the best return for the inputs used. The dairy sector is characterized by diversity, so there is a need to account for pure, cross (high and low), and local cow feeding regimes. There are also likely to be different regimes for different stages in the cycle of lactation/pregnancy, and the regimes may need to take account of the financial and operational constraints of smallholders.

A related example is the work of Land O'Lakes in the incentivizing of PESPS at the three MBGs. This model appears to have created a good pressure for production improvements in the respective MBGs and also for delivery to the processors. This is something that could continue to be experimented with to get a full understanding of the parameters of the model, as to where it works and where it may be limited.

Related to this evidence based approach, there is scope for applying the same approach to other dairy inputs, such as AI/Bull insemination and other common veterinary treatments where there is some debate of the relative efficacy of these. Combined with this, the publication of results puts pressure on providers to ensure their approaches and products are effective, otherwise more informed suppliers can take advantage of less informed buyers over the efficacy of their products and methods. Although this may seem challenging to the suppliers to be under scrutiny, as the feed suppliers have seen, there is a positive outcome in that buyers who were suspicious of the products and therefore did not purchase, appear now to be recognizing the benefits and may have increased demand.

To support this process, there is a need for the periodic and perhaps unannounced testing of products as a way to put pressure on manufacturers and suppliers to improve quality (particularly consistency of feeds to minimum standards). Independent testing and publishing provides a strong incentive to manufacturers and service providers (e.g. through publication of AI success rates) to improve what they offer. This is potentially a key role for the MDDA and RPAs working together on behalf of farmers.

It is recommended that:

Successor dairy programs to MDDA adopt more evidence-based approaches to test and then promote models of feeding and extension.

Successor dairy programs should use evidence-based approaches to investigate other key questions on dairy production, such as the effectiveness of AI vs. Bull, input-output performance comparisons and profitability (pures /crosses), efficacy of veterinary treatments, mortality rates of different breeds,

Successor dairy programs should support MMPA and RPAs to undertake periodic testing and publishing of results on performance (feed, AI technicians etc.) as a means to drive up standards of products and services

6.1.3 Adapting to Situational Changes

Another positive feature of the MDDA was how it adapted to changes. Although it had reasonably planned to work with Airtel Money, this was contingent on Reserve Bank of Malawi approval. When this was delayed beyond the period when the initiative would have had value to the MDDA, the team switched focus to procure a license for ESOKO SMS. This is an innovative model that could benefit from user testing and experience from operation as to what it can usefully do. Land O'Lakes has effectively 'bought down' the risk to enable dairy producer stakeholders to test out what they can do with it.

This is the sort of innovation that could revolutionize delivery of key production, productivity, marketing and governance messages for dispersed and relatively information poor farmers.

Another example of positive responsiveness is the way Land O'Lakes has picked up and expanded the VS&L issue to non-PLHIV groups, having seen its initial impacts. This has taken it beyond the original programmatic requirements, but this flexibility of approach is generating additional impacts for MDDA, USAID and the farmers.

The key lesson is around the need to adapt to opportunities, particularly where these revolve around emerging technology opportunities. One problem with development-funded programs is that once they are set (in advance), the parameters can be too tight to allow for responses to new situations (the breakdown of AI services) or opportunities (ESOKO). Although it is understood why there is a need to be clear on what deliverables are contracted, there could and should be more scope to allow for changes in the methods for achieving those or even new ends. Having said that, there has to be a balance with the need for the appropriate use of funds and a clear case and monitoring of implementation for innovative activities to ensure they are delivering what is expected.

No formal recommendation makes sense here as it would be too generic, but broadly the lesson is that adaptation to the circumstances that evolve is both necessary and desirable, particularly as new opportunities and technologies emerge.

7 Conclusions

The MDDA had many components including distribution of animals, support to AI services, production, market access, business and finance, Co-operative development, HIV/AIDs and OVC initiatives, gender and environment. One of the concerns raised in the 2010 evaluation was the wide range of indictors and related activities. Although the MDDA extension has dropped several indicators, it has added new ones and its activities remain very complex and diverse. In many areas, the MDDA activities are part of a coherent whole and activities worked synergistically. In other areas, there was not a complete connection between all the activities, though each had its merits.

This complex mix appears to be a function of a complex sector, with issues ranging from breeding to marketing, HIV/AIDS to environment. If it were possible to narrow down the focus, then this might enable future programs to make even more progress than the creditable progress that MDDA has made.

In most of its indicators, the MDDA extension has met its targets or exceeded them, some by very considerable margins. This has been the case in a difficult operating environment at times, including the recent problems over fuel that reduce mobility.

In a few areas, there were some shortfalls on the targets, notably around production. In mitigation, the whole dairy sector has faced considerable problems due to the breakdown of the liquid nitrogen plant run by GoM, which in turn undermined AI services. These services were key to the MDDA and so the knock on effects of that breakdown and failure by government to resolve it quickly has been seen in reduced access to AI, falling pregnancy rates and falling production. This has then put pressure on the MBGs, processors and Land O'Lakes who all have a considerable stake in restoration of the supply of liquid nitrogen. After a period of falling production, the measures taken appear to have halted and reversed the situation.

The breakdown of the marketing arrangement for supply to NDI in the Northern Region has also been very problematic, as well as some problems in Central Region around supplies to MDI. As with the liquid nitrogen, these are critical to the success of the dairy sector and MDDA. Again, measures to address the problems, such as support to MDFA to fill some of the gap, have assisted to halt a negative slide from formal to informal marketing.

It is important that future programs address these critical issues and act to ensure the overall sustainability of the sector going forward. Success in dairy is highly contingent on a range of inter-related factors and the break down in any one can derail overall progress.

Three very positive stories come out of this evaluation. The first is that Land O'Lakes has seen a considerable adaptation of its program over the life of the MDDA and in particular over the extension period. This has required Land O'Lakes to make changes in its approach in response to the situation of the dairy sector, and, to continue to evolve and respond to a fast evolving situation. A traditional model of dairy development would not have been able to manage this degree of change, and there is a need within the programmatic constraints to allow for flexibility and responsiveness.

The second is that the MDDA has begun to break down barriers in thinking by taking a more strongly evidenced based approach than in the past, such as on the feed trials. This focus brought out all sorts of responses, which private sector suppliers found challenging at times. However, looking back over the process, it has been effective at raising debate and attention on the issue, and apparently stimulated demand and supply. A similar approach is called for over other aspects of the dairy sector and key questions, such as:

1. Are pure-breeds (and if so which ones) sufficiently robust to cope in a difficult disease environment where farmers often lack resources to respond to situations they face?

2. What is the relative viability of different models of dairy farming from low-input/low output to high-input/high-output and what works best in what circumstances?
3. What is the efficacy of AI and other breeding services in an environment where key inputs may not be available?
4. How good is the actual performance of key inputs provided by public and private service providers to determine if they do what they claim and at what relative cost?
5. What are the key factors for success in MBGs, and how can these be fostered, including the ownership structure?

Finally, the MDDA has show a very exciting level of innovation in testing and 'buying down the risk' of new ideas, such as the use of ESOKO, financial partnerships and incentivizing PESPs in relation to milk volumes to be delivered. This sort of innovation is welcome because it enables step changes in performance and increased competitiveness.

The MDDA has stepped up to the challenges of the dairy sector and brought about some positive change at a particularly difficult time. Although the MDDA is now ending, the dairy sector continues to face challenges and will need continued innovation and responsiveness from its stakeholders, working in a collaborative manner.

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Kadale: "A small thing blessed to serve."

Annex 1: Scope of Work (Abbreviated)

Malawi Dairy Development Alliance, *Final Evaluation (2011-12)*

1.0 Background and Introduction

Land O'Lakes International Development has been implementing the USAID-funded Malawi Dairy Development Alliance (MDDA) since 2007. The objective of MDDA is to increase incomes for rural dairy farmers and participating value chain stakeholders operating in the Central and Northern Regions of Malawi. The program contributes to two of the USAID/Malawi's Operational Plan Objectives of Agriculture Sector Productivity and Private Sector Competitiveness. Furthermore, MDDA facilitates the realization of several additional impacts that contribute to the Feed the Future (FTF) results for Malawi. These include "Improved Economic Performance of the Agricultural Sector" and "Improved Nutrition-Related Behaviors, such as Consumption of Nutritious Foods."

Originally scheduled to end in 2010, the program was extended for an additional fifteen months, through March 31, 2012. During the extension period the program aims for the following results as a means of achieving its overall objective:

- Increased number of improved dairy animals available to smallholder farmers
- Increased access to inputs & services by small scale farmers and milk bulking groups (MBGs)
- Increased profitable production and sale of milk by small scale farmers & MBGs

1.1 Program Partners

In order to successfully implement the program, Land O'Lakes partnered with many private, research, and public sector partners. Some partners include: The Department of Animal Health and Livestock Development, three producer associations, 23 MBGs, the Dairy Producers Association Limited, 4 breeders, 5 feed manufactures, 4 processors, Airtel, GALVmed, GSJ Animal Health and Production Private Limited, New Building Society [Bank], NICO General Insurance, Wellspring/Esoko, Mponela AIDS Information and Counseling Centre (MAICC) and the National Association for People Living with HIV/AIDS in Malawi (NAPHAM).

1.2 Program design and implementation strategy

The program focuses on building the capacity of farmers, MBGs, and associations to run their operations as profitable businesses. This is expected to result in farmers and MBGs making more informed, profit oriented business decisions necessary to further increase production during and after MDDA. The implementation strategies also address cross-cutting issues of HIV/AIDS, gender and environmental impact mitigation.

Detailed description of program activities and results will be available to the successful bidder, who will review the documents as part of the SoW.

1.3 Assessments during the extension period

Farmer surveys

The MDDA program has conducted an annual survey since 2007. The aim of the survey is to measure the increase in household income, and the increase in the number of people employed in the dairy enterprise throughout the 23 MBGs in Central and Northern region. The survey assesses the economic status of dairy farmers under the project by completing the following tasks:

a) General demographic data (age, sex, marital status, hh size, etc)
b) Determine the sources and level of income for MBG members (dairy and non-dairy and the proportion of household income derived from milk sales).
c) Determine the level of employment (part-time, seasonal or full time) generated by the dairy enterprise at the household, MBG, regional association, input suppliers, and processor level.
d) Socio-economic status of dairy farmer households by analyzing their income and expenditure patterns.
e) Constraints to beneficiaries' participation in the dairy-oriented activities along the dairy value chain.
f) Analyze trend of the parameters above from past reports (particularly the 2010 evaluation)

2.0 Terms of Reference for the Evaluation

2.1 Objective and Scope of the MDDA Final Evaluation (FE)

The objective of the final evaluation is to assess whether the program has achieved the expected results as outlined in the results framework. Specifically, the evaluation will assess the impact of the MDDA program on the productivity and income of targeted households and enterprises. The evaluation will in addition assess program design, implementation, management, lessons learned and replicability and will be expected to establish plausible links between program inputs and outcomes/impacts, and draw lessons for improvement of future programs or similar activities.

The evaluation will examine the following key questions:

***Relevance**:* To what extent has the program met the needs of the beneficiaries and is aligned with Malawi's development investment strategy and with USAID and U.S. Government's development goals, objectives and strategies. The evaluation will also assess the project design, taking into account the socioeconomic and political context.

Effectiveness: The evaluation will examine, as systematically and objectively as possible, how well the program attained its overall goal and strategic objectives, and the extent to which the intervention contributed to the expected result.

Outcomes and Impacts of the Program:
The final evaluation will also assess the project's medium and long term effects, intended and unintended, positive or negative, and the extent to which these effects are due to the intervention. The evaluator is expected to analyze quantitative and qualitative data and report on the outcomes and impacts of the program on beneficiary households. Outcomes refers to the effects of the more immediate tangible benefits (increased household milk production, improved management of dairy enterprises, increased dairy incomes, etc.), while impacts refer to changes in the lives of targeted rural households (improved food security, improved nutrition, improved resilience of targeted households, job creation, etc). The observable changes in communities, in relation to the baseline and established objectives, should have resulted directly from program activities.[41] However, it is not to be confused with effectiveness. It is important to determine the effect of all of the program activities.

Efficiency: The extent to which the project resources (inputs) have led to the achieved results and whether similar results could have been achieved with fewer resources or alternative approaches.

Lessons Learned: The evaluator is also expected to elicit and draw key lessons learned (positive and negative) from the MDDA program, particularly those that can help USAID with the design and implementation of its Feed the Future Program, which will further help Malawi's dairy sector. The evaluator should illustrate best practices or best principles for replication in future programs.

Sustainability: Sustainability is an important component of Land O'Lakes development programs. Sustainability refers to how the activities and impacts will continue after the program ends. For example, the degree to which beneficiary farmers will continue to manage their dairy enterprises; Milk Bulking Groups (MBGs) will continue with viable operations; and so forth are all sustainability examples of a dairy program. Overall, the evaluation needs to establish whether targeted beneficiaries will continue to have long-term positive benefits resulting from the program. The evaluation should also analyze whether or not firms and/or organizations whose capacity has been built by the program will continue to provide services to dairy farmers once the activity has been completed.

***Crosscutting Issues*:**
The evaluator will also evaluate how well the program has addressed and integrated cross-cutting issues such as gender, HIV/AIDS, nutrition, and environmental compliance. An evaluation of such cross-cutting issues and their effect on beneficiaries and their households is important and it will assist USAID and Land O'Lakes in designing future projects.

Sample detailed questions are annexed (Annex 1). The consultant will be required to refine the list of evaluation questions and share with the Land O'Lakes Inc. team for approval.

2.2 MDDA Final Evaluation Key Tasks

The consultant is expected to assess changes at each level of the dairy value chain as well as the linkages and return on investment of the program. Below are the direct beneficiaries of the MDDA that will be included in the evaluation and the specific areas that will have to be assessed:

a) 3,396 farm families in the Central and Northern region

[41] Peter Oakley, Brain Pratt and Andrew Clayton, "Outcomes and Impact: Evaluating Change in Social Development, "INTRAC NGO Management and Policy Series No. 6 (Oxford: INTRAC, 1998) 35.

i. Increase in knowledge and adoption of new technologies of animal husbandry
ii. Access to and use of local extension service.
iii. Increase in knowledge and adoption of hygienic milk handling practices, transportation and storage.
iv. Understanding and performance of roles and responsibility of individual farmers as members of the bulking group/cooperative
v. Increase in the amount of employment generated by the dairy enterprise (part-time, seasonal or full time).
vi. Knowledge of HIV prevention methods
vii. Impact of Village Savings and Loan (VSL) interventions on the savings of PLHIV support group and MBG members.
viii. Number of individuals reached with HIV messaging and HTC services.

b) 23 MBGs
i. Milk collection and handling capacity, and quality control systems. Maintenance of the cold chain, where applicable.
ii. Organizational and business capacity of MBGs (Capacities to access inputs/services and use financial services such as banking, insurance, ESOKO network, etc. and steps taken to realize sustainable markets).
iii. Level of employment generated at the MBG (part-time, seasonal or full time).
iv. Increase in the dairy herds and sustainability of the heifer pass-on program.
v. Value and volume of milk sales.
vi. Profitability of milk bulking groups (particularly four focus MBGs in the Central Region).
vii. Membership of milk bulking groups (by age and gender).

c) Regional associations - CREMPA and MDFA
i. Organizational and business management capacity of the regional associations.
ii. Provision of breeding services demanded by member producer groups.
iii. Sustainability of the pass-on program.
iv. Level of employment generated at the association (part-time, seasonal or full time).

d) Dairy processors (DPAL, MDI, Lilongwe Dairies, MDFA, & Northern Dairies).
i. Increase in collaborative activities among processors.
ii. Increase in processing and marketing technologies adopted by individual processors as a result of the MDDA's interventions.
iii. Volume and value of raw milk bought from milk bulking groups supported by the MDDA.
iv. Level of employment generated in the processing business (part-time, seasonal or full time).

e) Input suppliers (2 Feed manufacturers, 3 veterinary companies and 6 cattle breeders).
i. Provision of products and services to dairy farmers. Value of transactions per month/quarter and cumulatively since 2008
ii. Type and frequency of extension services and training given to dairy farmers.
iii. New marketing and processing technologies adopted as a result of MDDA interventions.
iv. Level of employment generated in the input/service provision business –part-time, seasonal or full time.

f) The Department of Animal Health and Livestock Development.
i. Adherence to Malawi Government Livestock policy
ii. Technical dairy management capacity built in the Government's extension staff

3.0 Final Evaluation Consultancy Specific Tasks

The consultant will provide the following services as well as other activities, which are deemed necessary by Land O'Lakes Malawi so long as such activities are in line with the purpose and Objective of this scope of work:

- Undertake a literature review of the program documents and other relevant documents including, but not limited to the following:
  I. Approved Agreement
  II. Annual Survey reports
  III. Progress reports
  IV. Performance Management Plan
  V. Any other program documents to get acquainted with the program activities and indicators.

- Provide a protocol to establish an implementation plan that lays out how the consultant envisions conducting the evaluation. This will be part of the planning process via email correspondence and telephone conference calls with Land O'Lakes program staff.
- Provide an agreeable timeframe for the evaluation
- Develop survey tools that will provide information on indicators relevant to the evaluation (quantitative and qualitative as required) in close collaboration with the Land O'Lakes team
- Carry out fieldwork to collect quantitative and qualitative data; engage with key informants, staff, beneficiaries, cooperative members, government officers, other partners, private sector partners, other stakeholders, and other community members as needed to collect qualitative information for the evaluation.
- Enter, clean up, synthesize, analyze, and interpret both the data from the quantitative survey and the qualitative study.
- Prepare an evaluation report addressing the objectives of this final evaluation as outlined in this Scope of Work, including feedback from the presentation and recommendations on the overall Land O'Lakes/Malawi MDDA program for potential similar future project.
- Develop a Power Point presentation of evaluation findings, present and submit to Land O'Lakes Malawi and stakeholders.
- Fully address the concerns, comments, and issues raised during the presentation of the final evaluation report.
- Submit clean and final English versions of quantitative data sets in Excel formats and qualitative transcripts, field and interview notes in Word to Land O'Lakes Malawi.
- Pictures of the process will also be required.

4.0 Level of Effort and Required Expertise

We expect that **90 calendar** days are sufficient to complete this consultancy and evaluation activities. The selected consultant is expected to have strong expertise in final evaluations, specifically, evaluations of household income-based programs as well as technical aspects of dairy activities. The consultant is also expected to have prior experience in evaluating USAID funded programs.

The consultant is expected to work in a variety of settings and with a number of different people that will include members of staff, government officials, local government extension officers, cooperative groups, private enterprises and community members in rural and urban environments.

5.0 Relationship and Responsibilities

The consultant shall perform the tasks described above with the support of the Malawi Chief of Party, the Land O Lakes Malawi M&E Specialist, and the MDDA field team. During the evaluation, the consultant is also expected to work with the LOL HQ M&E team, in which case, he will be available for questioning and inquiry. Annex 2 details the relationships, roles and responsibilities of all those who will participate in the evaluation.

6.0 Timeline and Deliverables

6.1 Timeline

ACTIVITY	GOAL/OUTCOME	Expected Dates (2011-12)
Lead personnel to be available for inception meetings with Land O'Lakes Malawi and HQ Staff for up to three full days during the period of Dec 5th – Dec 9th. Discuss protocol which including methodology and implementation plan that lays out how the consultant envisions conducting the program evaluation (sample size, tools, methodology, schedules and responsibilities)	Final work plan with milestone dates time guideline, and logistical arrangements	Dec 21, 2011
Undertake a literature review of the program documents and other relevant documents including, but not limited to the following: • Approved MDDA Agreement • Baseline Survey report • Progress reports • MDDA Performance Management Plan • Past farmer surveys (2007-2010) • 2010 external evaluation • Review USAID GDA website and the GDA	To contextualize and aid in development of data collection tools and report	By Dec 31, 2011

ACTIVITY	GOAL/OUTCOME	Expected Dates (2011-12)
model and its applicability to the MDDA program • Any other program documents to get acquainted with the program activities and indicators.		
Drafting data collection tools (questionnaires for quantitative data, FGD guidelines, for all levels of data collection). Conduct 1 full day pre-test with LOL at one MBG and 1 day for modifications.	Final versions of data collection tools.	Jan 2-6, 2012
Start data collection	Data collection started	Jan 9, 2012
Data collection - Carry out the fieldwork to collect quantitative and qualitative data, including engage with key program staff, beneficiaries, cooperative members, government officers, other relief agency partners, private sector partners, other stakeholders, and other community members as needed to collect qualitative information for the evaluation. Quantitative: evaluator should propose a sample size large enough for robust evaluation. Qualitative: at least 10 MBGs to be reached. Data entry – data entered (1 person) Data analysis	A bullet point preliminary presentation of key trends found from quantitative and qualitative data collection which will serve as the basis of preliminary and final drafts An electronic version of all qualitative notes format, including quotes that summarize impact of MDDA on beneficiaries 1 electronic copy of finalized, clean data in Microsoft Excel 1 electronic folder of any applications, modules, and scripts developed to organize, process, & analyze data. 20-25 high quality photographs (min 300 dpi resolution photos) of some Program Evaluation data collection activities i.e. survey; interviews; FGDs burned onto a CD-ROM disc. Pre-report draft (electronic version, including data) using outline below;	Completed by Feb 18, 2012 Completed by March 22, 2012
Analysis and Report writing	First draft of report due to LOL that includes: Introduction; Protocol, Methods and Tools; Findings; Recommendations; Executive Summary; An introduction containing the objectives of the SOW and a brief description of the program; Methodology, Protocol and Tools; Results/Findings; Actionable recommendations to improve the design and implementation of this and similar future projects; Data limitations; Lessons Learned, best practices and/or best principles and Appendices that include: • SOW. • Composition of the team. • List of sites visited. • List of key informants. • Literature reviews. • Data collection tools. • References. Other appendices that document or support previous sections, and 5 Complete success stories (1-2 pages each)	Draft report due Mar 2, 2012
Receive feedback from LOL reviewers on bullet point preliminary findings of quantitative and qualitative results to be used to develop the report draft	Feedback received	Feb 25, 2012

ACTIVITY	GOAL/OUTCOME	Expected Dates (2011-12)
Receive feedback from LOL reviewers	Feedback received	Mar 17, 2012
Final Report writing, including changes integrated into report to fully address the concerns, comments, and issues raised by LOL on the draft evaluation report	Two bound copies of the final comprehensive evaluation report with an electronic copy on a CD-ROM or thumb drive Electronic files of all clean raw (final) quantitative and qualitative data collected including 2011 Farmer Survey data and tables/ charts/ data from comparison with previous farmer surveys. These files delivered in Excel /MS Access format for quantitative data & Word for qualitative transcripts/notes. One electronic folder of any applications, modules, and scripts developed to organize, process and analyze the data. One final report presentation given to Land O'Lakes Malawi and one electronic/hardcopy version of the presentation In-person presentation of key findings from the evaluation to Land O'Lakes, stakeholders, and other value chain stakeholders	Final report and presentation due Mar 21, 2012 Stakeholder results meeting by Mar 29, 2012

6.2 Deliverables

1. Final Work Plan with milestone dates, time guidelines and logistical arrangements
2. Final version of Data collection tools
3. Electronic version of all qualitative notes format, including quotes that summarize the impact of MDDA on beneficiaries
4. One electronic copy of finalized, clean data in Microsoft Excel
5. High Quality pictures of process and some survey participants (electronic form)
6. Preliminary summary of data analysis in bullet point format based upon trends of data analyzed that will be used to develop the pre-report draft
7. Pre-report Draft (electronic) following outline in Scope of Work
8. First Draft of Report following outline in Scope of Work
9. Final report (one hard copy, one electronic copy in Word)
10. One (1) electronic copy of finalized, clean data in Microsoft Excel format
11. Final report presentation to Land O'Lakes Malawi and stakeholders, including electronic and hard copy version of each presentation

Final Evaluation Questions

Effects and Outcomes

- To what extent has the program improved incomes of beneficiary households in targeted communities in relation to the baseline status?
- Are there other unintended but important outcomes and impacts (increased milk consumption in communities, increased employment opportunities, etc.) that have been realized in targeted communities as a result of program activities?
- To what extent has the program improved the capacity of cooperatives and milk bulking groups (MBGs) which have been used as vehicles for delivering goods and services to targeted households?
- Do the stakeholders have a sense of ownership of the program? What are their views on program implementation and progress?

Effectiveness

- How effective has the approach used by the program been in the attainment of the program's goals and objectives?
- How efficient has the program been in attaining its goals and objectives? What has been the average cost per beneficiary taking into account pass-on activities, training through TOTs,

etc.? If calculated based on the total household members directly benefiting from dairy income and milk consumption, what would the cost per beneficiary be?

- What is the program status with respect to target outputs in terms of quantity, quality and timeliness? What factors impede or facilitate the production of such outputs?
- Do the outputs contribute to the achievement of the strategic and intermediate objectives of the program?
- Which components are most critical and/or effective in achieving program objectives and intermediate results?
- Does the monitoring and evaluation system appropriately address the program's objectives and indicator targets?
- How effective was the technical assistance provided throughout the program? To what degree was the TA adopted among beneficiaries?
- What aspects of the program were particularly ineffective?

Sustainability

- What mechanisms have been put in place to ensure sustainability of program results?
- Are program activities and technical assistance related to adoption of better practices sustainable, i.e., are participants likely to continue receiving TA after the program ends? Are MCCs likely to continue operating and remain financially viable after the program ends? Are pass on activities going to continue after the program ends?
- To what extent will targeted beneficiaries continue to access long-term positive benefits after the program comes to an end?
- To what extent will other local or donor resources continue to be available to perform the activities the program now conducts that will require continuation after the end of the program?

Cross-cutting Issues

- What effect is the program having, if any, on the livelihood of the women beneficiaries and their households?
- How has the program affected the gender based relationships in targeted households?
- What can be said specifically, if any, about the program's contribution on those affected by the HIV/AIDS and their households?
- What effect is the program having, if any, on the capacity of households to mitigate environmental effects of scaled up dairy activities in their communities?
- How can programs such as this one improve and increase its impact on these cross-cutting activities or others on beneficiaries and their households?

Lessons Learned and Recommendations

- What are the main lessons that can be drawn from the program experience since its inception?
- What corrective actions are recommended regarding the design, implementation, reporting, monitoring and evaluation of the program?
- What actions are recommended to follow up or reinforce initial benefits from the program?

Annex 2: Composition of the Team

Team Leader: Jason Agar

Research Coordinator: Toby Lewis Donaldson

Field Research Supervisor: Richard Kusseni

Enumerator and data analyst: Don Kalonga

Enumerator: Abigail Khembo

Data Entry: Clara Nyasulu

Annex 3: List of Sites Visited and Persons Consulted

1. List of MBGs visited

Region	MBG Name	Target # of interviews	Actual # of interviews	Actual %
Northern Region	Chakhola	10	10	5.0%
	Doroba	6	6	3.0%
	Kapacha	11	11	5.5%
	Kavuzi	9	9	4.5%
	Kawindula	9	9	4.5%
	Lukonkhowe	6	6	3.0%
	Lusangazi	10	10	5.0%
	Sub-total	61	61	30.5%
Central Region	Chitsanzo	21	16	8.0%
	Dzaonewekha	20	24	12.0%
	Gondoli	8	8	4.0%
	Likuni	8	8	4.0%
	Lumbadzi	15	13	6.5%
	Machite	23	15	7.5%
	Nkhweza	8	0	0.0%
	Magomero	20	21	10.5%
	Mpalo	18	17	8.5%
	Mponela	7	7	3.5%
	Namwiri	10	10	5.0%
	Sub-total	158	139	69.5%
Grand Total		**219**	**200**	**100.0%**

2. List of Land O'Lakes Persons Consulted

Derek Mullen	Chief of Party
Amenye Mulwafu-Banda	M&E and PEPFAR Coordinator
Doreen Muhuwo	Business Technical & Logistics Coordinator
Yonah Alberto	Herds Team
John Amos	Business Development Extensionist
Max Sullian	Business Development Extensionist
Evance Henry Liwonde	Business Development Extensionist

3. List of Key Informants Consulted

Name	Position	Organization
Adena Detera	Farm Veterinarian	CREMPA/VSO
Herbert Chagona	Manager	CREMPA/MMPA
Edward Kalukusha Mwale	Regional Assoc. Manager	MDFA

Grantees

Maness Nkhata	Managing Director	Kakoma Estates
Wilfred Chanza	Director	Lakeshore Agro-Processors
Sute Mwasangula	Director	Nachali Farm
Isaac Katanga	Managing Director	Ndatani Feeds
Felix Jumbe	Managing Director	Peacock Enterprises

BVM and GSJ provided presentations at the Grantee Meeting, 20 January 2012

Leverage

Michael Shaw	Managing Director	Esoko/Wellspring
Felizarda Mbewe	Personal and Business Banking	NBS Bank
Esnart Nchembe	Personal and Business Banking	NBS Bank
Harry Mhone	Marketing Manager	NICO General Insurance

HIV/AIDs Training

George Kaunda	Programs Manager	MAICC
Amanda Manjola	Manager,	NAPHAM
Master Mpande	Program Officer	NAPHAM

Annex 4: Key Sources Consulted

Main documents, policies, reports and websites consulted:

Land O'Lakes Attachment B MDDA Program Description (2007)

Land O'Lakes MDDA Program Description MDDA (2009)

Land O'Lakes Baseline Study (2007)

Land O'Lakes Bi-annual, Environmental Compliance Report, December, 2011

Land O'Lakes Income and expenditure reports (Findings of the Annual Farmer Surveys) (2008 & 2009)

Land O'Lakes Environment manual (2009)

Land O'Lakes Final Evaluation 2010 (Kadale)

Land O'Lakes Performance Management Plan, January 2010 and 2011

Land O'Lakes Quarterly Reports (2007, 2008, 2009 (some missing), 2010 and 2011)

Land O'Lakes Workplan 2008

Land O'Lakes Workplan 2009

Land O'Lakes Workplan 2010

National Statistical Office, 2008 National Census

Sampling Guide (1997, Magnani R), Food and Nutrition Technical Assistance

USAID GDA website and the GDA model

Annex 5: Farmer Questionnaire

Farmer Household Income And Employment Survey

Milk Bulking Group (MBG) name …… Date of interview ……Jan. 2012

"Hello, my name is..... I am working for Kadale Consultants. We are helping Land O'Lakes to understand how well its dairy support program has worked. I want to ask you a few questions. Land O'Lakes will not find out what any particular person has said about them or the program. "

1 – Identification and Household Information

1-001 **Name of Respondent …… …… Cell number ……**

1-002 Sex of Respondent: Male (01) Female (02) (Circle based on observation)

1-01 Do you or your household own one or more **dairy** cow(s)?	***(Single response, do not prompt)***
Yes	***(go to 1-02)***
No / No response	***terminate the interview***

1-02 How many **dairy** cows do you or your household own?	***(Single response, do not prompt)***
Zero	***(terminate interview)***
One	01
Two	02
Three	03
Over three	04
No response	***(terminate interview)***

What breed(s) is/are your cow/s? ***(Single response, prompt options 1-4 only)***	***1-03a Cow 1***	***1-03b Cow 2***	***1-03c Cow 3***	***1.04d Other cows***	
Pure breed (e.g. Friesian or Jersey)	01	01	01	01	If no cows are pure or 7/8th or 6/8th Cross-breeds then terminate interview
Cross-breed (7/8th or 6/8th)	02	02	02	02	
Cross-breed (5/8th or less or Don't Know)	03	03	03	03	
Local breed (Zebu)	04	04	04	04	
Does not know	05	05	05	05	
No response	06	06	06	06	

1--04 Are you the household head?	
Yes	01 ***(go to 1-06)***
No	02 ***(go to 1-05)***

1-05 What is your relationship to the household head?	
1. Husband / Wife	01
2. Son / daughter (including adopted)	02
3. Son in law /daughter in law	03
4. Brother/sister	04
5. Mother/father	05
6. Grandson /granddaughter	06
7. Niece/nephew	07
8. Other	08
No response	09

1-06 What is your age?	***(If respondent cannot answer, then read out the age bands. Estimate age if does not know or will not say)***
Younger than 16	01 (Terminate the interview and thank them)
16 - 30	02
31 - 45	03
Over 45	04

2. Household Socio-Demographic Characteristics

2-01 What is your marital status?	***(Single response, do not prompt except to clarify if monogamous or polygamous)***
Single/Engaged (but not yet married)	01
Married (monogamy)	02
Married (polygamy)	03
Separated/ Divorced	04
Widowed	05
Other (specify)……	06
No response	07

2-02 Including yourself, how many people are there in your household	***Number _____***

2-03 In your household, how many children are:	***2-03a …***under the age of 5 years?	***2-03b …****aged 6-12*	***2-03c …****aged 13-18?*	***2-03d ….****orphans that you care for?*
None/No child	00	00	00	00
One child	01	01	01	01
Two children	02	02	02	02
Three children	03	03	03	03
Four children	04	04	04	04
Five or more	05	05	05	05
No response	06	06	06	06

2-04 In your household, how many adults are:	***2-04a …….****aged 18-60*	***2-04b …….***over 60 years old?	***2-04c ……..****chronically ill*
None/No adult	00	00	00
One Adult	01	01	01
Two Adults	02	02	02
Three Adults	03	03	03
Four Adults	04	04	04
Five Adults	05	05	05
No response	06	06	06

2-05 What is the highest level of education you achieved?	***(Single response, do not prompt)***
No formal education	01
Primary 1-8	02
Secondary 1-2	03
Secondary 3-4	04
Tertiary (University, College)	05
No response	06

2-06 Can you read and write?	***(Single response, do not prompt)***
Yes	01
No	02
No Response	03

3. Household Income, Expenditure and Assets

3-01 What is your household's largest source of income? **Single response, do not prompt**		***Supplementary questions***
Crop farming	01	If yes, what is the main cash crop ……...
Dairy farming	02	
Livestock (not dairy) and fish farming	03	If yes, which type of livestock …….
Formal employment	04	If yes then Govt…… or Non-government…….
Self-employed worker/tradesman	05	If yes, what type of trade……
Grocery/ retail / trader / middleman	06	If yes, main product……..
Ganyu	07	
Other (Pension, money from relative, etc.)	08	(If yes, then ***specify*** ……)
No Response	09	(still continue with 3.02, as may be willing to say)

3.02 How much did it give you in the month of December (last month)? MK _____

(nb if crop then put annual figure MK _____)

3.03 How much money does it give you in an average month: MK _____

3-04 What is the household's 2nd largest source of income? **Single response no prompt**		***Supplementary questions***
Crop farming	01	If yes, what is the main cash crop ……...
Dairy farming	02	
Livestock (not dairy) and fish farming	03	If yes, which type of livestock …….
Formal employment	04	If yes then Govt…… or Non-government…….
Self-employed worker/tradesman	05	If yes, what type of trade……
Grocery/ retail / trader / middleman	06	If yes, main product ……..
Ganyu	07	
Other (Pension, money from relative, etc.)	08	(If yes, then ***specify*** ……)
No Response	09	(still continue with 3.05, as may be willing to say)

3.05 How much did it give you in the month of December (last month)? MK _____

(nb if crop then put annual figure MK _____)

3.06 How much money does it give you in an average month: MK _____

3-07 What is the household's 3rd largest source of income? **(Single response no prompt)**		***Supplementary questions***
Crop farming	01	If yes, what is the main cash crop ……...
Dairy farming	02	
Livestock (not dairy) and fish farming	03	If yes, which type of livestock …….
Formal employment	04	If yes then Govt…… or Non-government…….
Self-employed worker/tradesman	05	If yes, what type of trade……
Grocery/ retail / trader / middleman	06	If yes, main product ……..
Ganyu	07	
Other (Pension, money from relative, etc.)	08	(If yes, then ***specify*** ……)
No Response	09	(still continue with 3.08, as may be willing to say)

3.08 How much did it give you in the month of December last year? MK _____

(nb if crop then put annual figure MK _____)

3.09 How much money does it give you in an average month: MK _____?

3.10 Of all other sources of income not mentioned, how much did you get in December? MK _____

3-11 Who decides how to spend the income……. ***(Single response, do not prompt)***	3.11a…..from dairy?	3.11b….from the other sources mentioned?
Husband alone	01	01
Husband and wife together	02	02
Wife alone	03	03
Other family member (***specify***……..)	04	04
No response	05	05

Note: spending is for the whole household ***Note: Mark p/a in margin if given yearly amount*** **3-12** How much money do you spend a month on:		Ask for an **average**
01	Maize	MK
02	Groceries (sugar, salt, cooking oil, soap etc.)	MK
03	Fuel for cooking (wood, charcoal, electricity) and lighting (Paraffin / candles)	MK
04	Crop inputs (pesticide/fertilizer, seed etc.)	MK
05	Livestock inputs (drugs, feed, etc.)	MK
06	Equipment hire	MK
07	Ganyu	MK
08	Land rents, housing rents or housing materials	MK
09	Other farming expenses	MK
10	Transport (Matola, bike repair etc.)	MK
11	Rent and/or housing materials	MK
12	Education / school	MK
13	Health / medical	MK
14	Business expenses	MK
15	Household items – pots, plates and clothes	MK
16	Airtime	MK
17	Payment of loan	MK
18	All other expenses	MK

4. Milk Production

Researcher note – check number of cows owned in 1-02/1-03 and tailor questions based on this

4.00 Which of your cows are lactating now? ***(Cow number is based on the same number and order in 1-03)***	Yes	No	i. If yes, how many litres did it produce yesterday?	ii. If yes, for how long has it been lactating? (Enter months
4.00a. Cow one	01	02	…….litres	……months
4.00b. Cow two	01	02	…….litres	……months
4.00c. Cow three	01	02	…….litres	……months
4.00d. Other cows Note: If 4 or more cows lactating then note how many in margin. Take an average	01	02	…….litres	……months

multiple response, do not prompt)	**4.01a** How did you get cow(s) for the dairy enterprise?	Was this from a pass on scheme?		
		Yes	No	Do not know
Bought the cow(s) with own money	01	01	02	03
Inherited the cow(s)	02	01	02	03
From the Land O'Lakes programme	03	01	02	03
From Government	04	01	02	03
From another organisation (***specify***……..)	05	01	02	03
Other source (***specify***……)	06	01	02	03
No response	07	01	02	03

(read out)	**4.02a** Last month what was your volume of..	**4.02b** Last month, what was the price per litre of…	**4.02c** What was your average amount in a month of…
1. Milk production	Ltrs	N/A	Ltrs
2. Milk consumption	Ltrs	N/A	Ltrs
3. Milk sold to the MBG	Ltrs	MK……..	MK…….
4. Milk sold to others	Ltrs	MK……..(average)	MK…….
5. Milk given to calf	Ltrs	N/A	Ltrs
6. Milk wastage	Ltrs	N/A	Ltrs

(read out) ***4-03 For all your dairy cows…***	**a** ..what was the cost last month of..	**b**…. What is the **average** monthly cost you have had to pay for…..
1. Feeds (roughage) e.g. hay	MK	MK
2. Madeya	MK	MK
3. Mineral supplements	MK	MK
4. Salt	MK	MK
5. Crude protein supplements	MK	MK
6. De-wormer	MK	MK
7. Dip	MK	MK
8. Veterinary drugs	MK	MK
9. Kraal/Khola maintenance ***(not original construction)***	MK	MK
10. Labour *(equivalent cost if not paid in money e.g. in food)*	MK	MK
11. Transport	MK	MK
12. Artificial insemination *(if used once or more in the last 12 months – semen plus charges)*	MK	MK
13. Bull insemination	MK	MK
14. Molasses	MK	MK
15. Soap	MK	MK
16. Equipment e.g. milk churns	MK	MK
17. Other dairy production costs	MK	MK

4.04 (Read out the following statements)	***Correct***	***Not correct***	***Does not know***	***No response/ Not applicable***
a. My cow's milk yield is higher than last year	01	02	03	04
b. My cow's milk yield is higher than 5 years ago	01	02	03	04
c. I sell more milk to the MBG than last year	01	02	03	04
d. I sell more milk to the MBG than 5 years ago	01	02	03	04
e. I use more supplementary feeds and vitamins than last year	01	02	03	04
f. I use more supplementary feeds and vitamins than 5 years ago	01	02	03	04
g. I produce more oil seed crops than last year	01	02	03	04
h. I produce more oil seed crops than 5 years ago	01	02	03	04
i. My income from dairy has increased compared to last year	01	02	03	04
j. My income from dairy has increased compared to 5 years ago	01	02	03	04
k. I use more ganyu for dairy than last year	01	02	03	04
l. I use more ganyu for dairy than 5 years ago	01	02	03	04
m. I have got HIV/AIDS messages through my MBG	01	02	03	04
n. I have been trained in construction of my cow shed to avoid urine, dung and spray run off into the water supply	01	02	03	04

4-05 What problems do you face in dairying?	***(Multiple response, do not prompt)***
Lack of market	01
Low prices	02
Late payment by the MBG	03
High deductions by the MBG	04
High taxation	05
Unable to get my cow pregnant	06
Low production	07
Lack of supplementary feeds	08
Lack of extension services/help	09
Lack of vaccinations/drugs /treatments	10
Animal health problem (death or illness)	11
Lack of labour	12
High spoilage of milk and loss of income	13
No major problems encountered	14
Other (specify)……..	15
No response	16

4.06 What assets/things have you bought using money from your dairy farming?	***(Multiple response, do not prompt)***
Bricks for a house	01
Iron sheets	02
Other materials for a building	03
Furniture	04
Motorcycle or other vehicle	05
Bicycle	06
Ox-cart	07
Stock of food (e.g. maize)	08
More dairy animals	09
Other livestock (e.g. chickens)	10
Radio	11
Cellphone/s	12
Land	13
Spent on education	14
Not yet spent (increased savings)	15
Other (***specify***……..)	16
No response	17

5. Participation of Farmers in MBGs

5-01 In what year did you become a member of the MBG?	***19 _ _ or 20 _ _***	***Don't Know _ _***

5-02 When joining the MBG, what was the…….. **(Do not prompt)**	a. Main reason	b. Second most important reason	c. Third most important reason
To get access to dairy cows	01	01	01
To learn how to look after my cows	02	02	02
To get inputs	03	03	03
To increase my production	04	04	04
To sell my milk	05	05	05
To increase my income / reduce poverty	06	06	06
Other (specify)……	07	07	07
No response	08	08	08

5-03 What services does the MBG offer to you as a member/beneficiary?	***(Multiple response, do not prompt)***
Source of feed and minerals	01
Buying of milk for sale to others	02
Training/extension on dairy farming	03
Source of veterinary services and advice	04
Source of veterinary drugs and tick sprays	05
Source of artificial insemination ('AI') services	06
Training in other things (HIV/AIDS awareness, training in business, finance etc.	07
Other (specify)……	08
No response	09

5-04 Overall, how satisfied are you with the MBG….	Very satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very Dissatisfied
a. As a buyer of my milk	01	02	03	04	05
b. As a source of dairy cows	01	02	03	04	05
c. As a source to learn how to look after my cows	01	02	03	04	05
d. As a place to get feed and vet drugs	01	02	03	04	05
e. As a place to get AI services	01	02	03	04	05
f. To have solidarity with others	01	02	03	04	05

5-05 What training have you got from or through your MBG in the last five years (unprompted then prompt) ***(circle if it applies) (Multiple response possible)***	***a) Unprompted***	***b) Prompted***
Training in looking after cows	01	01
Training in khola/shed construction	02	02
Training in when my cow is on heat/ready for insemination	03	03
Training in fodder conservation	04	04
Training in environment risks (urine, dung and spray)	05	05
Training in soya production	06	06
Training in agricultural pasture establishment	07	07
Training in HIV/AIDS awareness and action	08	08
Training in Village Savings and Loans group formation and management	09	09
Training in finance	10	10
Training in business and enterprise	11	11
Training in Co-operative development	12	12
Training in women rights	13	13
Training in Gender	14	14
Other (specify……)	15	15
None of the above	16	16
No response	17	17

5-06 Have you accessed any of the following services through your MBG or with the help of the MBG	***(read out, multiple response possible – circle at least one response)***
Opening a bank account (savings)	01
Getting a loan from a bank or other lender	02
Information by SMS / text message	03
Joining a village savings and loan group	04
Airtel Money account	05
Information from Esoko SMS text messages	07
Cow insurance	07
No response	08

6. Employment at the farm-level

6-01a Who works in the dairy enterprise? ***(Read out line by line. Circle those that apply. Multiple response possible)***		**6.01b** If yes, then does this person do….. (**single response per row**)		
		All tasks	Many tasks	A few tasks
a. Husband (if applicable)	01	01	02	03
b. Wife (if applicable)	02	01	02	03
c. Children (male)	03	01	02	03
d. Children (female)	04	01	02	03
e. Other relatives (male)	05	01	02	03
f. Other relatives (female)	06	01	02	03
g. Hired workers full time (male)	07	01	02	03
h. Hired workers full time (female)	08	01	02	03
i. Hired workers part time (male)	09	01	02	03
j. Hired workers part time (female)	10	01	02	03
k. No response	11			

(Read out, line by line, single response per line) **6-02** Of the milk you sell, how much do the following buy?	All your milk	More than half	About half	Less than half	None
a. The MBG	01	02	03	04	05
b. Vendors	01	02	03	04	05
c. Neighbours	01	02	03	04	05
d. People at a local market	01	02	03	04	05
e. Processors (direct sales)	01	02	03	04	05
f. Local businesses (shops, restaurant/café etc.)	01	02	03	04	05

(Read out the ones that they sell to in 6.02) **6-03** How reliable at buying is…….	Always reliable	Mostly reliable	Sometimes reliable	Never reliable
a. The MBG	01	02	03	04
b. Vendors	01	02	03	04
c. Neighbours	01	02	03	04
d. People at a local market	01	02	03	04
e. Local businesses (shops, restaurant/café etc.)	01	02	03	04

Read out	MBG	Vendors	Neighbours	Local market customers	Local businesses
6-04a Who pays the best prices?	01	02	03	04	05
6-04b Who pays the next best prices?	01	02	03	04	05

6-05 Who do you prefer to sell your milk to?	***(Single response, do not prompt)***
MBGs	01
Vendors	02
Local market	03
Neighbours	04
Local businesses	05
Other (Specify……..)	06
No response	07

6-05 Which of these foods did you eat yesterday?		READ THE LIST OF FOODS. PLACE A *ONE* IN THE BOX IF ANYONE IN THE HOUSEHOLD ATE THE FOOD IN QUESTION, PLACE A *ZERO* IN THE BOX IF NO ONE IN THE HOUSEHOLD ATE THE FOOD.	
A	Any nsima bread, rice noodles, biscuits, or any other foods made from millet, sorghum, maize, rice, wheat, etc	A	
B	Any potatoes, yams, manioc, cassava or any other foods made from roots or tubers?	B	
C	Any vegetables?	C	
D	Any fruits?	D	
E	Any beef, pork, lamb, goat, rabbit wild game, chicken, duck, or other birds, liver, kidney, heart, or other organ meats?	E	
F	Any eggs?	F	
G	Any fresh or dried fish or shellfish?	G	
H	Any foods made from beans, peas, lentils, or nuts?	H	
I	Any cheese, yogurt, milk or other milk products?	I	
J	Any foods made with oil, fat, or butter?	J	
K	Any sugar or honey?	K	
L	Any sugar or honey?	L	

"Thank you for your time."

Annex 6: MBG Interview Instrument

Name of MBG	
Date of Meeting	January 2012

Name of Interviewee	Male/Female	Position

1.1 What year was the MBG formed?	
1.2 What are the services offered to members? *(Buying and marketing milk, access to feed & minerals & drugs & dips, revolving heifer schemes, artificial insemination scheme, bull insemination scheme, dip tank, veterinary services, extension and advice, etc……)*	1. 2. 3. 4. 5.
1.3 What are the services that members use most?	1. 2. 3. Comments:
1.4 What are the services that members use least?	1. 2. 3. Comments:
1.5 How many members supplied milk in:	2011: _____ members 2010: _____ members 2009: _____ members 2008: _____ members 2007: _____ members 2006: _____ members Comments:
1.6a What was the total volume of milk brought to the MBG in the following years	2011: _____ Ltrs (January to December) 2010: _____ Ltrs (January to December) 2009: _____ Ltrs (January to December) 2008: _____ Ltrs (January to December) 2007: _____ Ltrs (January to December) 2006: _____ Ltrs (January to December) Comments:
1.6b What was the total volume of milk sold by the MBG in the following years (January-December	2011: _____ Ltrs (January to December) 2010: _____ Ltrs (January to December)

– state period if not calendar):	2009: _____ Ltrs (January to December) 2008: _____ Ltrs (January to December) 2007: _____ Ltrs (January to December) 2006: _____ Ltrs (January to December) Comments:
1.7 Which processors/buyers have you sold to in 2011 in order of most importance? (Probably there is just one or maximum two) How many tonnes of milk (kilo-litres) have you sold to each?	1. _____ - _____ Kilo-Ltrs 2. _____ - _____ Kilo-Ltrs 3. _____ - _____ Kilo-Ltrs Comments:
1.8 For the buyer you sell to now, what is the current price per litre (gross, without deductions) and what deductions have been made (transport, loans, etc.)?	Processor 1 (above) Price per litre before deductions MK /litre Deduction 1. (state what it is_____) Amount deducted = MK /litre Deduction 2. (state what it is_____) Amount deducted = MK /litre Deduction 3. (state what it is_____) Amount deducted = MK /litre Value of all other deductions = MK /Ltr Net price after all deductions = MK /ltr
1.8b What other monthly deductions (fixed) are made from the income received by the farmers?	
1.9 What are the main changes in selling to the processor(s) compared to 2 years ago?	
1.10 What proportion of milk is sold to processors compared to other buyers (vendors)?	2011: _____% 2010: _____ % 2009 _____ % 2008 _____ % 2007 _____ % 2006 _____ % Comment:
1.11 What proportion of milk is rejected by processors? *If response given in litres, note down, then come back and calculate % from figures in 1.6a after the interview.*	2011: _____ % 2010: _____ % 2009 _____ % 2008 _____ % 2007 _____ % 2006 _____ % Comment:
1.12 What storage facilities do you have in working order? *(Volume of tanks, whether cooled, age of tanks, and details of other facilities) (Probably one or two)*	1. _____Ltr tank 2. _____Ltr tank 3. _____Ltr tank 4. _____Ltr tank

Who financed these?	Financed by: Comment:
1.13 How frequent are the deliveries/collections from your current buyer?	Comment:
1.14 What volume of supplementary feed is supplied by the MBG to farmers? Who supplies you?	2011 : _____ (50kg bags/Tonnes) supplied by_____ 2010 : _____ (50kg bags/Tonnes) supplied by_____ 2009 : _____ (50kg bags/Tonnes) supplied by_____ 2008 : _____ (50kg bags/Tonnes) supplied by_____ 2007 : _____ (50kg bags/Tonnes) supplied by_____ 2006 : _____ (50kg bags/Tonnes) supplied by_____
1.15 How many employees work for the MBG	2011 Full time ____ Part time _____ Casual ____ 2010 Full time ____ Part time_____ Casual_____ 2009 Full time ____ Part time_____ Casual_____ 2008 Full time ____ Part time_____ Casual_____ 2007 Full time ____ Part time_____ Casual_____ 2006 Full time ____ Part time_____ Casual_____
1.16 What are the main HIV/AIDS activities run by or through the MBG?	1. 2. 3.
1.17 How many orphans and vulnerable children were served through the HIV/AIDS MBG initiatives?	2011: 2010: 2009: Comment:
1.18 Do OVC support centres receive milk from the MBGs under MDDA? If so how many?	Yes / No Number: Comment:
1.19 What volume of milk was donated to OVC support programs in:	2011: 2010: 2009:
1.20 How many nutrition, milk handling and hygiene education sessions have been conducted in childcare centres in this MBG in:	2011: 2010: 2009:
1.21 How many people from this MBG have been trained in milk handling and hygiene, and nutrition in:	2010: 2009:
1.22 How many people have been trained in HIV/AIDS prevention education sessions in MBGs in:	2011: 2010: 2009:
Following where applicable	
2.1 What are some of the successes and challenges you have encountered with the heat synchronisation program?	
2.2 What are some of the successes and challenges you have encountered	

with the CAHNW and PESPS on animal husbandry?	
2.3 What changes have you seen in access to financial services, such as Village Savings and Loans? - Esoko - NBS savings and loans - Nico insurance	
2.4 What some of the successes and challenges you have encountered with the training in nutrition?	
2.5 What some of the successes and challenges you have encountered with the training in Co-operative Development?	
2.6 What some of the successes and challenges you have encountered with the training in women's rights?	
2.7 What changes have you seen in the roles of men and women in the dairy farms?	

Any other comments? *(Write on the back if necessary)*	Thank you

Annex 7: MBG Activities

Extn period only		USG 1	USG 2	USG 3	USG 4	USG 5												
MBG NAME	Priority	HIV training	OVC milk	New tech/ mgt practices	Ag productivity	Econ Strength	AI heat Synchro	Heifer placement	CAHNW training	PESPS	Access to NBS	VSL	Access to Esoko	Cow insurance	Avg income change	Nutrition training	CDP training	Co-operatives
Chakhola	High	x		x	x				x				x	x				
Chikwina	Low priority	x		x	x		x		x			x	x	x				
Chitsanzo	High (Focus MBG)	x	x	x	x							x	x	x	x	x	x	x
Doroba	Low (no cooling)	x	x	x	x		x		x			x	x	x		x		
Dzaonewekha	High(Focus MBG)	x	x	x	x	x		x	x	x			x	x	x	x	x	x
Gondoli	High	x	x	x	x	x			x				x	x		x		
Kapacha	High	x	x	x	x				x			x	x	x		x		
Kavuzi	High	x	x	x	x	x			x			x	x	x		x	x	x
Kawindula	High	x		x	x				x				x	x				
Likuni	High	x		x	x			x	x		x		x	x				
Lilongwe Bridge	High	x		x	x				x				x	x				
Lukonkhowe	High	x	x	x	x				x			x	x	x		x		
Lumbadzi	High	x	x	x	x	x	x		x			x	x	x		x	x	
Lusangazi	High	x	x	x	x				x			x	x	x		x	x	
Machite	High (Focus MBG)	x	x	x	x		x	x	x	x			x	x	x	x	x	x
Magomero	High(Focus MBG)	x	x	x	x		x	x	x			x	x	x	x	x	x	x
Majiga	Low (no cooling)	x		x	x		x		x				x	x				
Mpalo	High	x	x	x	x	x		x			x	x	x	x		x	x	x
Mpasa	High	x	x	x	x	x			x				x	x		x		
Mponela	High	x	x	x	x	x			x			x	x	x		x		x
Namwiri	High	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	
Nkhweza	High	x	x	x	x	x			x				x	x		x		
Sonda	High	x	x	x	x				x				x	x		x		