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Strengthening evaluation effectiveness and impact

Tanzania LEAD

Mid-term Evaluation

ItadUK

Oxford Policy Management

itad

e-Pact, is a consortium led by Oxford Policy Management and co-managed with Itad

Preface and acknowledgements

The evaluation team would like to acknowledge the help and assistance provided by the management and staff of BRAC Tanzania especially in assisting with field work logistics. The team would also like to acknowledge the support and assistance of the DFID Tanzania office.

Disclaimer

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Abbreviations

AAER	Adopt–Adapt–Expand–Respond
AKF	Aga Khan Foundation
AMDT	Agriculture Markets Development Trust
ASDS	Agricultural Sector Development Strategy
CAADP	Comprehensive Africa Agriculture Development Programme
DAC	Development Assistance Committee
DFID	Department for International Development
EM	Evaluation Manager
FTESA	FoodTrade East and Southern Africa
GoT	Government of Tanzania
IITA	International Institute of Tropical Agriculture
IP	Implementing Partner
LEAD	Livelihood Enhancement through Agricultural Development
M4P	Making Markets Work for the Poor
M&E	Monitoring and Evaluation
MAFC	Ministry of Agriculture, Food Security and Cooperatives
MTE	Mid-Term Evaluation
OECD	Organisation for Economic Co-operation and Development
PICS	Purdue Improved Crop Storage
PMP	Performance Monitoring Plan
PPP	Patient Procurement Platform
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
ToC	Theory of Change
ToR	Terms of Reference
VFM	Value for Money
WFP	World Food Programme

Executive summary

Summary of the programme

The Livelihood Enhancement through Agricultural Development (LEAD) programme is a four-year (2013–17) programme funded by the UK Department for International Development (DFID) to increase the income of smallholder maize and poultry farmers in Tanzania. The maize and poultry subsectors are an important resource for both household use and income for large numbers of people in Tanzania, with maize being Tanzania's main crop and poultry farming very common, small-scale and dominated by women farmers. Poultry farming is mainly for household consumption although it can also be an important source of additional income to pay for services such as school fees or medical emergencies. Maize farming is characterised by high costs related to accessing sales markets, and complexities around volatile markets, low use of inputs, post-harvest loss and loss resulting from disease and climatic shocks. Demand, however, is high, and there are opportunities for expansion through improved methods and access to markets.

The programme aims to use a Making Markets Work for the Poor (M4P) approach to establish sustainable links between farmers, input and service providers and output markets, while also improving farmer skills and access to inputs and new technologies. The overall target is to improve the household income of 105,000 targeted rural poor men and women in 15 regions. The programme has four outputs and associated activities:

- Local, regional and national markets accessed.
- Quality and availability of inputs and technologies for smallholder farmers improved.
- Access to agrifinance by smallholder farmers improved.
- Demonstrable gaps in the value chain for maize and poultry addressed.

The programme activities aim to increase linkages between market actors in the supply chain – within farmer groups and between farmer groups, traders and input suppliers – and provide investment to facilitate market activity at different levels. The programme further aims to build and share knowledge on inputs and new technologies, including increasing the understanding of markets among farmers and traders, and leveraging finance and investments along the value chain.

Summary of the evaluation

The Evaluation Manager (EM), managed by Itad UK, carried out the mid-term evaluation (MTE) in Q4 2016.The MTE is formative and uses a theory-based approach to consider progress to date and lessons learnt. The evaluation design considers the programme in relation to the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) evaluation criteria: effectiveness, efficiency, relevance, sustainability and impact. It also considers 'crosscutting issues': gender, poverty focus and monitoring systems.

The evaluation questions consider progress against outputs and test the theory underlying the programme as presented in the Theory of Change (ToC). The questions explore how and why any change or progress has occurred. Since the programme aims to use M4P approaches, the evaluation uses the Adopt–Adapt–Respond–Expand (AARE) framework as the conceptual framework to explore systemic change.

The evaluation uses a mixed-methods approach, combining secondary documentary evidence with household survey data, focus groups and key informant interviews.

Main findings and conclusions

The following outlines the main findings and conclusions of the MTE, grouped according to the evaluation criteria.

Relevance

A point which needs to be considered in relation to this MTE report is the timing during which the evaluation took place. This MTE takes place six months before the end of the programme and therefore its utility in relation to learning, outcome & impact to inform further programme implementation is limited

Main findings: The LEAD programme is relevant at a macro level to the objectives of the Government of Tanzania (GoT), the African Union and DFID, and at a micro level to the household beneficiaries. The programme targets local smallholder farmers, trader and agrovets, facilitating both information and market linkages, with a view to sustaining these beyond the scope of the programme. The programme targets both male and female farmers, with women representing 51%of the programme beneficiaries

Conclusions: The programme focus has maintained its relevance, addressing both macro- and micro-level need and finding ways to link the two.

Impact (uptake of training, production and income, market access, use of loans, unanticipated impacts)

Main findings: Maize groups report an increase in the application of GAP resulting in higher yields. Poultry groups report the adoption of use of tools for poultry feeding and watering, as well as reporting the uptake of improved feeding and medical care practices resulting in higher prices for their birds. Provision of information regarding good husbandry and agricultural practices has resulted in increased yields, allowing for increased consumption of maize within the household and increased prices of sold poultry, with both outcomes adding to increased household resilience.

Farmers who have participated in LEAD report increased yields (maize) and flock numbers (poultry). Poultry traders who purchase from these farmers report that birds from LEAD trained farmers are larger and of better quality than those from non-LEAD farmers.

LEAD's ToC identifies sales into three possible markets (contract sales, sales into non-local markets and collective marketing). Results show a significant increase in two of the three (collective selling, sale in non-local markets) for poultry farmers. Maize farmers have enjoyed contractual agreement sales increase from 3 to 8%. Respondents in poultry focus groups reported increases in incomes, whereas maize farmers reported that increased yields had led to increased consumption within the household. LEAD trained poultry farmers are more likely to report an increase in income from farming than their maize counterparts.

There are case studies showing the use of the agrifinance loans by individual farmers, and an internal monitoring report shows that the average usage of loans for farming activities was 78% for both poultry & maize farmers in December 2015. While use of loans is likely to be for the primary purpose of improving farming activity, loan repayments are reportedly often from another source of income. In some cases, farmers perceive loans negatively as a result of previous experiences with microfinance.

Unanticipated impacts are emerging in relation to the benefits of producer group membership. Some groups are setting up their own group saving schemes and some are investing in group businesses. Group members report very positive impacts in terms of support (both social and financial) from within the groups.

Main conclusions: Programme activity with poultry farmers is demonstrating successes, with poultry farmers adopting training to improve the quality and number of birds produced, using loans to purchase inputs, linking to and using new routes into the market and adopting new market strategies. This is resulting in increased income for poultry farmers. The impact for maize farmers is more complex. Farmers are adopting the training, and are seeing an increase in production, but in most cases this is not resulting in increased income, with additional maize consumed at household level. Important unanticipated impacts are emerging demonstrating the value of group membership.

Effectiveness (private sector partnerships, adoption of training, uptake and use of loans, training of agrovets/agrodealers and traders)

Main findings: LEAD can evidence activities resulting from about half of its private sector partnerships, most of which involve demonstrations of new products to farmers and most of which are concentrated in the maize sector. A number of organisations want to learn from LEAD's experience, especially its reach and scale.

LEAD training has increased knowledge regarding new practices and there is evidence of this knowledge translating into practice. There may, however, be some financial barriers to the adoption of new technologies. To some extent, LEAD has trained farmers to act as proponents of the improved practices and to promote these to their neighbours.

LEAD has exceeded its targets for agrifinance loans disbursement. Loans use is largely to pay for inputs and new technologies, although there is also evidence of part of the loans being used to set up small businesses. Some borrowers still perceive the given repayment window as unrealistic, especially in a maize farming context, despite LEAD having changed the repayment schedule in response to farmer concerns.

There is evidence that training for agrovets/agrodealers and traders has led to more interactions between them and farmers. Without exception, both maize and poultry farmers report that they trust the agrovet or agrodealer that they are in contact with as a result of the training. Poultry farmers report that access to the trader gives them better prices, especially through collective selling.

Main conclusions: The programme's main activities are proving effective in achieving outputs. There are some particular issues relating to loans of which the programme is aware, but the programme does not plan to address these given the late stage of implementation. A particularly effective tool in facilitating market actors is the training for traders, agrovets and agrodealers, which has positive impacts on both those stakeholders and the LEAD farmers.

Efficiency (market facilitation, investment fund, organisational structure, value for money)

Main findings: LEAD can evidence its role as facilitator of market linkages and improvements in its facilitation approach. The documents show an increase in certain types of farmer sales, and evidence of increases in income. However, in terms of training, the initial provision of information and provision of agrifinance loans, BRAC remains a service provider. It is not yet clear which organisation(s) would assume responsibility for these roles post-programme, although BRAC will continue the provision of the agrifinance component as part of its wider agrifinance programme. .

Grant outcome data are showing significant increases in income, assets and business involvement among grantees. LEAD producers groups are benefiting from interaction with grantees, as are other smallholder farmers in the value chain. Specific interviews within the poultry market report that the Investment Fund has allowed clients to contribute directly to the value chain and to extend services beyond the scope of LEAD trained farmers.

LEAD can demonstrate use of effective communication methods within the team. The biggest organisational challenge LEAD faces is high staff turnover. There appears to be limited opportunity for local staff to initiate suggestions for change or improvement, entrenching service delivery rather than promoting market innovation.

LEAD is inconsistent on reporting against value for money (VFM), and does not have clear systems in place to capture these data. LEAD could improve VFM by improving the type of data it collects and by addressing its staffing model. The programme appears to perform better than other programmes in some areas, and in other areas does not give as much value.

Main conclusions: The programme is playing the role of both service provider and market facilitator, with the former relating to the delivery of training and loans. This has an impact on the ability of the programme to be truly an M4P programme, as evidenced by the fact that no organisation has come forward to take up any of LEAD's roles when the programme closes. There are significant benefits felt by Investment Fund grantees, and evidence that this builds gaps within the value chain. Organisationally, the limited opportunity for staff to adapt to the situation on the ground is also limiting the programme's M4P approach.

Governance

Main findings: Previously DFID had concerns regarding LEAD's hierarchical management structure. Reports of LEAD's fora for staff discussion, and other changes, indicate LEAD is attempting to make improvements and become more adaptive. While BRAC may be more adaptive to staff-centred requests, there appears to be little leeway or encouraging of staff suggestions for programme adaptation or improvement.

Main conclusions: Despite efforts to become more adaptive, it appears that the governance structure continues to restrict the programme's ability to adapt to on-the-ground circumstances.

Sustainability (facilitation workshops, farmer groups)

Main findings: LEAD reports that workshops fill an important role in enabling the sharing of information from LEAD's market assessments, and LEAD report that workshop participants have shown interest in continuing to work together.. Farmer groups agree they will continue to work together. There are concerns about the expansion of the programme process beyond the targeted and identified beneficiaries.

Farmers perceive value-added in cooperating for farming purposes and for mutual support in terms of personal issues, as evidenced through the formation of other group-centred structures. Poultry groups in particular report value in collective marketing of their produce.

Main conclusions: There is little evidence on the sustainability of the elements that rely on LEAD staff, for example facilitation workshops and information provision to farmers groups. Groups themselves are keen to continue working together because of perceived benefits, but it is unclear whether this will happen once the programme officers are no longer available.

Crosscutting issues (monitoring and adaptation, monitoring quality, poverty, gender)

Main findings: There are some examples of LEAD taking action on monitoring findings, but there is no evidence to suggest this happens systemically. LEAD's Performance Monitoring Plan does not give guidance on how to use monitoring data to inform programmatic changes. There is limited opportunity for country-based staff to interpret data and suggest appropriate responses.

LEAD's reporting against the coframes regular and comprehensive but there is little reporting linking activities with outcomes or follow-up actions.

LEAD's survey results classify participant farmers as subsistence smallholder farmers. However, it is not clear if and how LEAD includes the most marginalised farmers within this demographic. There is no measurement of the household's level of poverty in the midline survey.

LEAD has done some gender analysis revealing the different experiences of men and women farmers, but it is not clear how this analysis is feeding into programming. Both men and women are involved in maize farming, while more women (and some older men) appear to be involved in poultry farming. It is not clear why women maize farmers earn less than their male counterparts.

Main conclusions: While the monitoring system has produced timely data against the logframe, the set-up of the system limits the generation of useful data to inform programme delivery. The programme has succeeded in working with a high proportion of female farmers, although it is unclear the extent to which gender analysis has informed programming. The same lack of clarity also relates to the poverty focus of the programme, as group formation strategies are not uniform or systematic.

Lesson learning

Main findings: LEAD engages with many similar programmes to share learning. The most concrete example of the effect of this on LEAD programming is LEAD's partnership with PPTL and with the One Acre Fund.

It is not clear from programme documentation whether the programme first determined the cause of market failures before starting programme activities. There is no clear strategy for the sustainability of LEAD's market interventions, given the programme's service provision role. This may have implications for the reach of the programme to achieve scale through the Adapt and Expand models. There is little evidence of the programme acting in a dynamic and adaptive fashion.

Main conclusions: LEAD networks extensively with other programmes, forging useful links to learn from others and to have others learn from them. The M4P approach is not strong, largely because of to the service provision role played by LEAD and the lack of adaptation to the market situation.

ToC:

The MTE examines the programme theory of change and finds that it has largely held true with three particular variations.

1. Although there is evidence that poultry farmers are selling birds collectively through links to traders enabled by LEAD, farmers are still selling individually as and when they need income, selling as a group only when they do not have an urgent need.
2. In some cases groups have evolved beyond the focus of improved production (e.g. to act as savings cooperatives or run alternative businesses) and it is unclear whether these newly evolved groups will continue to remain focused on their original purpose of production improvement, especially when input from LEAD is withdrawn.
3. The ToC underplays the contribution of agrifinance to the LEAD model, and is not part of the programme funding. Future analysis of the ToC should include consideration of the inter-linkages between the offering of agrifinance leads and the uptake of new technologies and inputs.

Another important consideration in relation to the ToC is that it is not clear, given the limited scope of the programme, whether the proposed programme outcomes and impacts will be felt within a wider market system.

Recommendations

We recommend that the programme consider developing sustainability scenarios that it can then communicate with its various stakeholders. The timing for this is important, as the final workshops and meetings are currently in the planning process, and recommendations on sustainability should be included.

The programme should continue with its lesson and information sharing with other similar organisations and these organisations should look to learn and collectively apply lessons to their interventions.

Considering that the programme may wish to develop further with other donor partners, we recommend that any future programme start by identifying the reasons for the current market obstacles and develop strategies to address these to increase the likelihood of programme sustainability.

The currently successful agrifinance model, adopted from the BRAC approach in Bangladesh, would be more acceptable to many if adapted to take into consideration the longer market lead-time of maize farming.

The group solidarity dynamic evidenced among many of the producer groups is of significant value in terms of ensuring the sustainability of the programme activities, but also in helping replicate among existing communities. In the last months of the programme, additional efforts should be made to help replicate how successful groups are working.

Groups should be encouraged to share their experiences of training more widely. In the last months of the programme, staff should work with groups to give them confidence to train others.

We recommend the programme use programme data more effectively to make decisions and that this decision-making process be documented and shared with relevant stakeholders.

Trained maize farmers report that households consume a portion of increased yield. If the programme seeks to improve its contribution to the maize market, we recommend it consider more harvest cycles in its maize programmes to ensure households can produce sufficient to consume within the household and still have excess to sell into the market.

Additional research to consider what increased maize subsistence means to household income in terms of displacement of funds could be undertaken.

We recommend collecting further information about the value of facilitation workshops and the market analysis information as part of the final evaluation and during the final stage of workshops in February 2017.

LEAD should develop its economy indicators further and continue to track existing indicators over time. It should also document examples of ‘cost-conscious behaviour’ (i.e. broader actions it has taken to control costs). The programme should consider dropping the initial VFM indicator ‘cost per farmer reporting a 10% increase in income’ if data are not available to report on this indicator.

LEAD has significant work to do with regard to its effectiveness VFM indicators. The programme should redefine these VFM indicators in line with its available data sources, especially the midline survey data. The programme needs to extrapolate total programme impact for these refined indicators from the survey data. The programme needs to conduct further analysis of the data for maize farmers where there are no significant reported results for key household food security and welfare data points.

1 Background and context

1.1 Programme purpose and context

The Livelihood Enhancement through Agricultural Development (LEAD) programme aims to increase the income of smallholder maize and poultry farmers by improving farmers' skills, facilitating linkages to farm inputs and promoting linkages and development of markets for smallholder farmers in Tanzania. The overall target is to improve the household income of 105,000 targeted rural poor men and women in 15 regions. The value of the project is £8.2m for the period 2013 to 2017.

The LEAD programme is being implemented in a national context very supportive of its aims. The Government of Tanzania's (GoT's) national policy commitments, such as its Vision 2025 and National Strategy for Growth and Reduction of Poverty, cite the integral role of agriculture in achieving economic growth. Agricultural-specific policies such as the Agricultural Sector Development Strategy prioritise improved incomes for rural farmers. The aims of LEAD are also consistent with the UK Department for International Development's (DFID's) new Economic Development Strategy,[1] which stresses the need to increase women and men's access to agricultural markets.

The maize and poultry subsectors are an important resource for both household use and income for large numbers of people in Tanzania. Maize is Tanzania's main crop, grown mostly by smallholders. Similarly, poultry farming is very common, small-scale and dominated by women farmers managing flocks in their yards.

Maize farming is characterised by low use of inputs and improved seeds, volatile markets, post-harvest losses, and difficulties and high costs relating to accessing sales markets. Demand for maize is high and growing throughout Tanzania, with opportunities for maize farmers to expand through improved methods and better access to markets.

Poultry farming is mostly for household consumption, but some output is sold, in particular to pay for school or medical fees. Again, this is a growing market, with increased demand for chicken meat and eggs, especially for 'local' bred chickens, which receive higher prices in urban areas. However, farmers face various problems, including diseases, which tend to spread easily and often destroy flocks, subsequently deterring some farmers from investing in increasing production.

LEAD is a nationwide programme operating across 15 regions[2] that cover five characteristically distinct agro-ecological zones. Agricultural contexts therefore differ across the programme area, in particular in terms of rainfall. Market access also differs, especially in relation to poultry, with access to larger urban markets increasing potential for sale and income. The LEAD programme operates from 40 BRAC branch offices across these regions. These branch offices run other BRAC programmes that differ according to region, apart from microfinance, which operates across all branches.

1.2 Theory of Change

Figure 1 presents the LEAD Theory of Change (ToC).The programme focus is on the poultry and maize sectors and it aims to utilise a Making Markets Work for the Poor (M4P) approach in order to

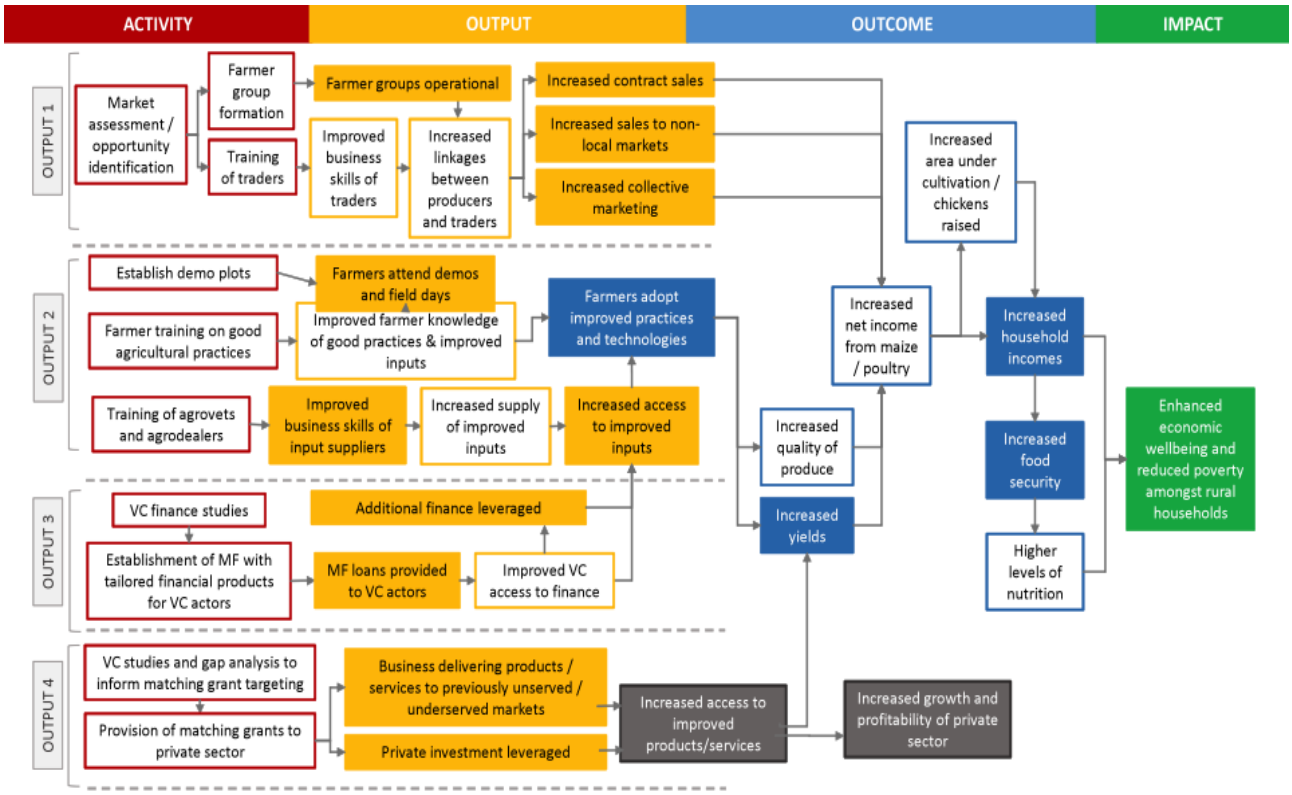
[1] DFID (2017) Economic Development Strategy: Prosperity, Poverty and Meeting Global Challenges.

[2] Dar Es Salaam. Zanzibar, Kilimanjaro, Arusha, Dodoma, Manyara, Morogoro, Tanga, Iringa, Mbeya, Mwanza, Shinyanga, Tabora, Mara, Singida.

establish sustainable links between smallholder farmers, input and service providers and output markets. The ToC focuses on four main areas of change:[3]

1. Local and national markets accessed through formation of, and support to, producer groups.
2. Improved quality and availability of inputs and technologies available to smallholder farmers.
3. Increased access to agri-finance by smallholder farmers.
4. Demonstrable gaps in the value chains for maize and poultry addressed.

Figure 1: LEAD Theory of Change



As stated in the programme logframe, the impact of the LEAD programme is enhanced economic wellbeing and reduced poverty among rural households. The overall outcome is incomes increased for smallholder farmers supported by the programme. The ToC identifies the key outcomes leading to increases in income – namely, increased yield, increased area under cultivation and increased net income from maize or poultry.

To achieve these outcomes, the programme has outputs at different points along the value chain involving a range of different market actors (e.g. farmers, agrovets, agrodealers, traders and other enterprises). Activities designed around the main areas of change target each output level to improve access to inputs and market linkages across the market system:

- **Local, regional and national markets accessed:** Farmer groups (poultry and maize) are formed and provided with training and information aimed at helping farmers access markets. Traders receive training in market and business skills linked to the producer groups through the

[3]DFID (2016) LEAD Annual Review. Draft.

LEAD programme officers. LEAD conducts market assessments to inform the training of traders and farmers' groups.

- **Quality and availability of inputs and technologies for smallholder farmers improved:** The second set of activities focuses on training to improve access to and availability of inputs. Farmers receive training on the benefits and use of inputs. Agrovets and agrodealers receive training to improve business skills and better understand how to meet the needs of their target farmers, with links between farmer groups and agrovets/agrodealers.
- **Access to agri-finance by smallholder farmers improved:** BRAC supplies agri-finance to meet the needs of LEAD farmers, with the aim of enabling farmers trained by LEAD to access finance to invest in inputs and increased production.
- **Demonstrable gaps in the value chain for maize and poultry addressed:** A Project Investment Fund has been set up to target small businesses and entrepreneurs across both value chains (maize and poultry). The aim of the fund is to provide investment in otherwise limited or weak services to improve availability of better quality and more affordable inputs and services. LEAD also sets up linkages with private companies that can provide value in the maize and poultry sectors.

The programme activities aim to increase linkages between market actors in the supply chain – within farmer groups and between farmer groups, traders and input suppliers – and provide investment to facilitate market activity at different levels. The programme aims to build and share knowledge on inputs and new technologies, including increasing the understanding of markets among farmers and traders and leveraging finance and investments along the value chain.

2 Purpose and scope of the evaluation

During Q4 2016, the Evaluation Manager (EM), managed by Itad UK, undertook an independent Mid-Term Evaluation (MTE) of the LEAD programme funded by UK DFID.

2.1 Evaluation purpose

As set out in the Terms of Reference (ToR), the overall purpose of the MTE is to 'provide an independent, cost-effective assessment of the effectiveness and… efficiency of […the] programme... [and] to inform and adjust the implementation.' The MTE provides the opportunity to inform the final phase of the programme by focusing on **effectiveness** (achievement at output to outcome levels); **efficiency** (looking at delivery mechanisms, organisational structures and systems and value for money (VFM)); and **governance and crosscutting issues** (such as gender, social and poverty focus and monitoring systems and use). The aim is to produce practical and useful feedback and guidance to the Implementing Partners (IPs) and other relevant stakeholders. The MTE also looks forward to the final evaluation, considering future data needs and availability.

In addition, the MTE considers other Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) evaluation criteria – **relevance, sustainability and impact**. With respect to impact, the MTE considers the types of impacts experienced and the potential for future impact, rather than measuring impact. It provides data to build up an idea of the potential of the programme to generate sustainable market system change. It also explores how the programme is addressing need in the context of agricultural markets in Tanzania (ensuring relevance). The final evaluation will build on these data to establish impacts achieved, whether the programme is sustainable and if it has addressed needs in the particular context.

2.2 Evaluation utility

An important consideration in relation to the utility of this MTE is the timing. This MTE takes place six months before the end of the programme and therefore its utility in relation to learning to inform further programme implementation is limited. However, LEAD and DFID consider the MTE an important tool to inform further work needed to ensure the sustainability of the programme as well as future thinking for possible options beyond the end date of the programme.

In order to ensure the utility of the evaluation, both DFID and BRAC were involved in its design. The EM proposed the Evaluation Framework and adaptations were made in response to comments from both DFID and LEAD, with a particular focus on ensuring the evaluation questions would produce data that meet the needs of both parties at this late stage in the programme.

The MTE has reviewed the existing LEAD VFM indicators (outlined in the MTE design document) and has calculated updated VFM metrics against these indicators where data are available. Where data are not available at this stage, this VFM review highlights how the programme can continue to develop the VFM system over time, and in some cases calculates alternative VFM indicators based on what data are available. The VFM review follows the three main dimensions of economy, efficiency and effectiveness.

2.3 Communications

The results, findings and recommendations from this evaluation will be communicated to the programme implementer and to DFID. The draft findings were communicated to DFID, which provided feedback and commentary. These suggestions were considered and are presented in this final version of the report.

While it would be ideal to communicate these findings and recommendations to a wider audience, given the timing of the evaluation it is suggested that a wider audience is engaged only regarding the findings and recommendations of the final evaluation. In keeping with the Paris Declaration principles, this wider audience should include GoT representatives, particularly the Ministry of Agriculture, Food Security and Cooperatives (MAFC), responsible for public agricultural extension services. Findings should also be shared with programmes and organisations LEAD has had previous interaction with, including other DFID-funded programmes, in particular FoodTrade East & Southern Africa and the BEAM Exchange, and other donors/implementers, including the World Food Programme (WFP), Aga Khan Foundation (AKF) and One Acre Fund. The nature of LEAD's involvement with these actors is detailed in Section 4.8.1 under Lesson Learning.

3 Approach and methodology

This section outlines the evaluation questions, approach, data collection methods and considerations on the availability and quality of the data.

3.1 Evaluation questions

The MTE evaluation questions follow the OECD-DAC evaluation criteria, as discussed above. The questions cover the key areas identified in the ToR:

- Evaluate the **effectiveness** of each of the output and outcome areas.
- Evaluate the **efficiency** of the programme, including, but not limited to, delivery mechanisms, management and VFM.
- Evaluate the suitability of programme **governance**.

- Examine **crosscutting** issues such as synergy between interventions, monitoring and the gender, social and poverty focus.
- Make **recommendations** to improve the design and delivery of interventions.
- Ensure appropriate **data-gathering mechanisms and studies** are in place for the final evaluation.

The evaluation matrix (Appendix 2) outlines the questions, sub-questions, indicators and data sources used to meet these requirements of the MTE. LEAD and DFID reviewed the framework to ensure it would produce information of use to the programme and DFID.

3.2 Evaluation approach

The evaluation is a formative evaluation, using a theory-based approach developed to use mixed-methods data collection to allow for synthesis of different types of data. The formative nature of the evaluation is, as stated earlier, limited by the timing of this MTE. However, the MTE explores programme implementation and progress to date and provides lessons learnt and recommendations. It also provides a basis for the final evaluation.

The theory-based approach allows for the exploration of the change generated by the LEAD programme and the evidence as to why and how change happens. Using an approach that tests the programme theory, the evaluation produces findings that:

- **Ensures accountability** by providing evidence of the degree to which the programme achieves its objectives according to the results chain and ToC.
- **Helps inform strategy** by looking at the difference between theory and reality, identifying areas of programme strategy adaptation.
- **Strengthens delivery** by providing data that show how and why change is happening.[4]

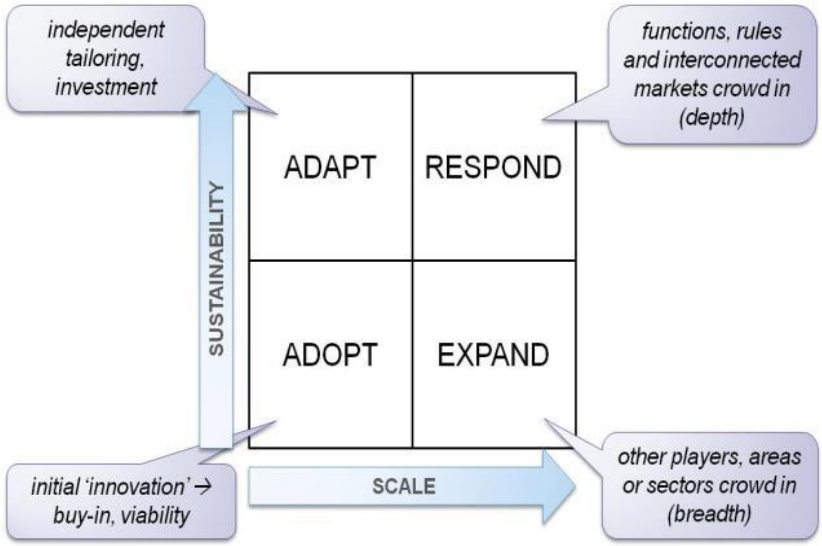
The evaluation goes beyond looking at what change is taking place, by looking at how change happens, what works for whom and in what context. The evaluation elaborates appropriate evaluation questions, data collection methods and approaches to data analysis, looking for evidence that sheds further light on how this programme is working for which parties.

Mapping the programme activity-level evaluation questions to the ToC output levels demonstrates how the MTE is testing the different theories beyond the causal pathway. The questions allow for an examination of what is happening, the context within which it is happening and an unpicking of the assumptions behind the theories on which the programme is developed.

This programme has a focus on systemic market change, and, as such, the evaluation needs to consider the whole ToC in relation to systemic change. In order to do this, the MTE uses the 'Adopt–Adapt–Expand–Respond' (AAER) framework to explore evidence in terms of the four elements of systemic change.

[4]Itad Mid-term Evaluation Design Report 2016.

Figure 2: Adopt–Adapt–Respond–Expand framework[5]



Adopt: A market player successfully adopts a pro-poor innovation.

Adapt: The initial partner (market player) continues independent activity around the innovation that they originally adopted in the pilot phase. The adaptation stage occurs when a programme deems that early adopters are likely to continue to improve, develop and rollout the innovation.

Expand: A number of other market players have adopted the innovation (or clear variants thereof) owing to demonstration or competitive pressures, as original partners and early adopters begin to reap benefits.

Respond: The increasingly mainstream innovation(s) triggers a secondary response from players in the wider sector, or in adjacent sectors connected to it. These responses appear in the form of changed or new supporting functions and rules that reflect the original innovation and its widespread adoption.

It is unlikely that at the MTE phase of the programme we would be able to gather evidence of any 'respond'-related activities; however, there are early indications of possible 'expand' and 'adapt' activities. This framework informed the evaluation questions (Appendix 2), ensuring that questions were asked that provide information about the possibilities of replication, sustainability and facilitation rather than service delivery, and signs of responses from other similar programme actors. It also provides a basis for the interrogation of the theories behind the programme's systemic change focus.

The LEAD evaluation was initially part of a bundle of DFID Tanzania evaluations of growth programmes with plans for cross-learning, particularly in the area of farmer training on improved agronomic practices and improved market linkages. The LEAD evaluation is now stand alone; however, it is hoped sharing of findings with a wider audience will still enable cross-learning in DFID.

3.3 Data collection methods

This evaluation uses both qualitative and quantitative methodologies, mixing methods to provide both the summative data to assess progress and the formative data to draw lessons to inform the remaining programme period. The team used survey data collected by the BRAC research team,

[5] Adapted from The Springfield Centre (2015) The Operational Guide for the Making Markets Work for the Poor (M4P) Approach. 2nd edition funded by SDC & DFID.

alongside qualitative key informant interviews, focus groups and a document review. The EM assessed the quality of the MTE survey carried out by the BRAC research team (Appendix 6).

3.3.1 Focus groups

The EM conducted focus groups with producer groups. The sampling for the focus groups reflects the survey sample (see Table 1), with groups identified from the same 10 branches in order to be able to compare and triangulate the qualitative and quantitative data. The team selected the sites to ensure representation of the agro-ecological differences across which LEAD works.

The selection of branches ensures a good representation of different agro-ecological zones and market types, taking into consideration practical and logistical considerations so that the highest number of focus groups took place within the available timeframe. Four focus groups, two of maize and two of poultry, took place in each of the five branches shown in grey in Table 1. The team separated focus groups according to maize and poultry farmers and included a demonstrator and lead farmer as far as possible. All groups included at least 50% women (Table 2).

Table 1: Geographic distribution of MTE focus groups

Survey branches	Agro-ecological zones				
	Eastern	Southern Highlands	Central	Northern Highlands	Northern (lake zone)
Tegeta (Dar es salaam)	X				
Ruaha (Iringa)		X			
Manyoni (Singida)			X		
Bunda (Mara)					X
Nyegezi (Mwanza)					X
Mwika (Kilimanjaro)				X	
Machame (Kilimanjaro)				X	
Gallapo (Manyara)				X	
Bububu (Zanzibar)	X				
Korogwe (Tanga)	X				

Mixed male and female focus group discussions took place, since the producer groups themselves are mixed. The team explored whether this would result in lower inputs from women; however, the team had previously conducted group discussions with mixed-sex producer groups and found the women would often lead the conversation. This was also the case in the piloting of the focus group guidance and then subsequently throughout the focus groups.

Table 2: MTE focus groups by branch

Branch	Maize focus groups	Poultry focus groups
Tegeta	2	2
Ruaha	2	2
Manyoni	2	2
Mwika	2	2
Machame	2	2
Total focus groups	**10**	**10**

The EM developed focus group guidance and question sheets, with the involvement of LEAD stakeholders. Particular attention was made to ensure the questions would be appropriate to ask to the mixed groups and that they would be easily understood and facilitate discussion. The team piloted the guidance with two LEAD groups, identifying and correcting question overlaps, as well as revising overly complicated questions. Both focus group facilitators subsequently worked together on one focus group to compare approaches to facilitation and ensure compatibility between approaches, exploring the level of probing necessary to ensure full answers from the focus groups.

Focus group attendees had been previously informed about the purpose of the focus group, and plenty of time was allocated at the beginning and the end of the session for questions from the respondents. This time was often taken advantage of by the focus group attendees. The use of recording equipment was discussed, as was the fact that no names would be used in the reporting of this evaluation.

3.3.2 Key informant interviews

In addition to the focus groups, facilitators carried out key informant interviews (Table 3). The team prepared interview schedules for these depending on the type of key informant. It was less practical to pilot these schedules because of the timing of the data collection process; however, as one facilitator started interviews a week before the other facilitator, revisions were made to the schedules and further guidance was given based on experience.

Key informants were selected to provide either case study information based on individual experience or because of their knowledge of a particular issue across the programme. These included LEAD staff, key market stakeholders, private sector actors, government agricultural extension officers and other actors within the same development domain.

Table 3: Key informant interviews

Area	Key informant
Kilimanjaro (Mwika and Machame)	Seed companies x 2
	Agrovets
	Agricultural extension officer
	Livestock extension officer
	Trader x 2 (one poultry, one maize)
	LEAD regional coordinator
	LEAD area coordinator
	LEAD programme officers
	Agrodealers
	Investment fund recipient
Tegeta/Dar es Salaam	Poultry trader
	Non-LEAD farmer
	Agrovet
	Agrodealer
	Investment fund recipient
	LEAD programme officers
	LEAD monitoring officer
	LEAD market development officer
	BRAC credit officer
	WFP
	AMDT
	Heifer International
	PPTL

Area	Key informant
Ruaha	Agrovet
	Agrodealer
	Poultry trader
	Maize trader
	Programme Officers
	Non-LEAD farmer x 2
	Investment fund recipient
Singida	Agrovet
	Agrodealer
	Maize trader
	Poultry trader
	Regional manager agri-finance
	Non-LEAD farmer
	Agricultural Extension officer
	Non-LEAD trader
	Investment fund recipient

The team shared the requirements of this phase of primary data collection with LEAD management and LEAD arranged the focus groups and key informant interviews. This does of course introduce the potential for bias within the selection. Convenience and practicalities of bringing together stakeholders influenced selection. However, there is sufficient variation in responses to suggest that they demonstrate a representative sample of the different views and experiences of being part of the LEAD programme.

The facilitators who undertook the sessions conducted analysis of the focus groups and key informant interviews. One facilitator used a translator with notes prepared based on the translation given during the sessions. An EM team member subsequently checked these translations for accuracy. The team analysed thematically both sets of focus group and key informant interview notes, based on the evaluation questions (see Section 3.3.3). Triangulation of grouped responses with document review and survey data was undertaken where appropriate.

3.3.3 Household survey

The BRAC research team conducted the household survey at the same time as the focus group and key informant interviews. The EM reviewed the household survey design to ensure it included questions and information needs for the MTE. The survey is a follow-up to a baseline survey, using control and treatment selections within the same sampled area as the baseline survey. Appendix 5 provides a full description of the methodology. The survey covers three evaluation questions:

- **Evaluation Question 1:** Whether the programme actually helped to increase adoption and productivity and if this translated into economic benefits for farmers participating in the programme.
- **Evaluation Question 2:** Whether producer groups are sustainable and how beneficial they are to the farmers.
- **Evaluation Question 3:** How effective agricultural financing was in promoting the use of improved agronomic practices.

The EM used the data presented in the survey report to triangulate and synthesise with the qualitative primary data and secondary document data to respond to the evaluation questions.

3.4 Evaluation source data

The EM developed an evaluation matrix (Appendix 2) to guide data collection and analysis from various sources according to the different evaluation themes. Secondary data were used from the LEAD programme, and primary data were used from focus groups and key informant interviews (collected by Itad) and the household survey findings (collected by BRAC).

3.4.1 Data sources and quality

LEAD management provided programme documentation in response to requests from the EM. These include Annual Reports, Quarterly Reports, Output Reports, a Baseline Report and Adoption Survey Report, as well as programme design documents including the Inception Report, Performance Monitoring Plan and Investment Fund Grant manual. In addition, the team reviewed DFID documents, including the LEAD Business Case, LEAD Annual Reviews and a 2010 joint DFID–Irish Aid country programme evaluation. A number of additional documents from external sources, such as GoT, were also consulted (Appendix 4). The team mined the documents for data relevant to the MTE questions, collating, reviewing and analysing the data against the evaluation matrix. The team used the following data:

- **LEAD outcome data:** Quantitative data reporting against the logframe indicators, presented quarterly by LEAD.
- **LEAD output data:** Qualitative data reporting against the four main output areas.
- **2016 MTE survey data:** Household survey data collected by BRAC and compared against the baseline and adoption surveys.

As mentioned, the timing of the MTE coincides with BRAC's own evaluation to maximise the utility of both exercises. BRAC conducted second round impact and adoption surveys. The first round of the adoption survey carried out in 2015 experienced some difficulties, including challenges with the supervision of enumerators, many of whom had no experience and little availability to carry out the work. Ahead of the next round of surveys, the evaluation team discussed the proposed process and reviewed the survey, making changes as required. Consideration was also given to the process during the piloting of the household survey.

The EM reviewed the quality of the survey process, report and data. We include the quality assurance report in Appendix 6. In relation to data quality, the reviewer focused on the accuracy of the entries for the various variables, the completeness of the dataset and consistency. The team checked the entries for outliers or values that did not fit the unit used to measure the variable or the current Tanzanian context. Concerning completeness of the data, the team checked for missing observations owing to errors during data collection and/or processing. The team was not given access to the complete dataset (because of time constraints), but the general quality of the data received is good with some minor problems with variable labels and some missing observations. The team explored whether the report used data accurately and appropriately, answered the required evaluation questions, was factually accurate and identified assumptions made. The team also assessed the readability and usability of the report. Overall, the evaluation team feels confident in the quality of the survey data and report used as part of the dataset for this MTE.

However, there are some significant limitations to using these data. The reports provided were not always disaggregated according to gender or location (see Appendix 5). This severely affected the ability of the evaluators to interrogate the BRAC quantitative data in line with the qualitative findings. Rather, the analysed quantitative findings are presented alongside the qualitative findings, and, where discrepancies or inconsistencies are evident, these are highlighted.

3.4.2 Data analysis

Data from different sources was used to varying degrees to answer specific evaluation questions, triangulating sources and synthesising findings (see Appendices 2 and 7 and Section 4). By way of example, in synthesising information from data sources to answer EQ1.1, data from focus groups and from key informant interviews were used, with the latter regarded as a more significant source. In answering EQ 1.2 the programme documentation was regarded as the principle source.

The focus group responses were analysed according to focus group question. Facilitators noted translated responses to each question, taken from the recordings of the focus groups, in some (limited) cases providing direct quotations and in most cases producing an amalgamated response to each question with key responses highlighted from different focus group participants. The amalgamation was conducted using deductive coding drawn from the evaluation questions. Data were also analysed according to focus group type (maize or poultry) and region. As the analysis continued, evidence of data saturation was seen, with many of the focus groups providing very similar responses to key questions. Given that two different facilitators carried out the focus groups, each facilitator adapted their questioning slightly as they identified data saturation, giving some variation in questions asked.

A further round of inductive analysis was considered based on the roles of respondents, but this was rejected because of the nature of the focus group transcripts received.[6] This also prevented the evaluators from using any form of QCA, or any QDA software.

Key informant interviews were written up in translated note form, again with responses to the interview questions. In the case of the key informant interviews, questioning by interviews was less standard, as the interviewing was often informal (e.g. in a busy market, inbetween customers in a shop), and interviewers had to make a judgement about the types of questions to ask in order to obtain the most useful response in the time allowed.

The key informant interview data was used to check against the findings of the focus groups, with the data analyst checking the emergent themes and findings from the focus group analysis frameworks. For example, many of the focus groups spoke of using agrovets or agrodealers who they had been linked to by LEAD. They mentioned how they 'trusted' these suppliers because of the contact through LEAD, but also because they had experienced good quality supplies from them. The key informant interviews with the agrovets/agrodealers then highlighted how they had seen an increase in customers as a result of the link through the LEAD programme, and that the trust they had from their new clients had resulted in a 'word-of-mouth' spreading of their reputation and an increase in non-LEAD clients as well.

As noted in Section 3.4.1, data were also mined from secondary data sources, using a data extraction template created according to the evaluation framework. These data were written up as a secondary literature review, with this review used as the data source against which to triangulate primary data. Household survey findings were treated in the same way, with key findings from the report being synthesised with the primary data.

3.5 Evaluation limitations

The evaluation has potential limitations concerning its reliance on secondary data supplied by BRAC and LEAD and the timing of the evaluation. In relation to the secondary data sources, as outlined above, the evaluation uses existing documentation as well as the household survey carried out by BRAC, and as such is reliant on the timeliness and quality of these data. As stated in Section 3.4, the team checked the quality of the data and conducted ongoing discussions with

[6]Focus groups were conducted in the local languages. Written records of the facilitators' interpretation were used as source documents for the evaluation.

the BRAC and LEAD teams to answer queries about the data. As the full dataset was not available for quality checking, this process was limited to self-selected 'important variables'. However, the close interaction between the team, LEAD management and the BRAC research unit have helped in ensuring that questioning can be open and honest, with concerns raised from either side.

The selection of focus group participants and key informants by LEAD also presents a particular limitation in relation to potential selection bias, as set out in Section 3.3.2. In terms of ensuring the evaluation was feasible and practical within the given logistical setting, LEAD's role in identifying groups and key informants was considered the most appropriate way to proceed. The sites for the data collection were chosen by the evaluation team, taking into consideration the household survey collection sites as well as other sampling criteria, but LEAD programme staff in each of the areas were asked to identify and arrange suitable groups and key informants. LEAD staff were present at most of the focus groups and key informant interviews, although the staff present were not always known to, or introduced to, the participants. In some cases, the staff kept their distance. Discussions were held with LEAD staff and they were made aware that they might be asked to leave sessions if the facilitator felt their presence was hindering discussion. Responses given by participants demonstrate that the groups were not afraid to demonstrate disagreement with LEAD, given that they were prepared to offer criticisms of the programme and raise problems faced.

The use of summarised rather than verbatim transcripts presented some limitations to the richness and depth of qualitative analysis. The data did not allow for quantification of qualitative findings, nor robust differentiation of focus group respondents. The accuracy of raw data collected was potentially influenced by the recording process as the nuance of discussions may have been misunderstood. There is the potential for the introduction of biases in the recording of discussions, stories and examples by facilitators, focusing on topics that they themselves find interesting or relevant and interpreting discussion in light of their own experience. However, these effects were minimised by initial joint facilitation and discussion carried out by facilitators to ensure a similar and comparable approach and understanding.

The timing of this MTE is a particular limitation. It took place six months before the end of the programme, which means its value in terms of informing ongoing development of the service, may be limited. However, we used the data to consider elements of sustainability in the final months of the programme, as well as to inform decisions around the future of the programme with other potential donors, and it provides information that can inform other similar programmes.

4 Evaluation findings

4.1 Relevance

	Evaluation questions	Indicators
1.2	How does the programme fit within the wider framework of policies and other programmes that have similar aims?	- Correlation and gaps between programme and wider policy/programme framework.

Key finding: *The LEAD programme is relevant at a macro level to the objectives of the GoT, the African Union and DFID and at a micro level to the household beneficiaries. The programme targets local smallholder farmers, trader and agrovets, facilitating both information and market linkages, with a view to sustaining these beyond the scope of the programme. The programme targets both male and female farmers, with women representing 67% of the programme beneficiaries.*

4.1.1 Wider policy framework

Written in 1999, Tanzania's Development Vision 2025 sets the overall strategy for GoT.[7] It foresees the achievement of high quality livelihoods for Tanzanians, and a strong competitive economy, of which agriculture is 'the backbone', growing at 8% per year. In 2001,GoT published its Agricultural Sector Development Strategy (ASDS), with the primary objective of creating 'an enabling and conducive environment for improving profitability of the sector as the basis for improved farm incomes and rural poverty reduction in the medium and long-term'.[8] GoT has committed to the African Union's Comprehensive Africa Agriculture Development Programme (CAADP) and LEAD intends to contribute to the achievement of the 6% annual agriculture sector growth. In addition, Tanzania's National Strategy for Growth and Reduction of Poverty II,[9] more commonly known by the Swahili abbreviation 'MkukutaII', refers to agriculture as 'central to poverty reduction in general and hunger/food poverty in particular' (p.6).

The DFID Southern Agricultural Growth Corridor of Tanzania (SAGCOT) business case emphasises the need for complementary projects like LEAD, stating 'initiatives that focus on poorer areas (like BRAC Tanzania) have an important role to play, alongside other safety net programmes' (SAGCOT Business Case 2014), and the need for programmes providing agrifinance to smallholders.

Of particular relevance to the LEAD programme is the importance of agrifinance in the National Micro-finance Policy, which 'provides a framework for empowering farmers and livestock keepers through access to credit'; and of the Gender Policy, which gives special attention to 'ensuring that women have access to land, other productive resources, training and labour saving technologies'. A gender disaggregation of LEAD beneficiaries (Midline Report, November 2016) indicates that the programme has 67% women beneficiaries.

Lastly, LEAD is relevant to DFID's own objectives. According to the DFID LEAD Business Case, as 'an intervention to support rural communities [LEAD] will contribute to DFID's objectives of boosting rural incomes (Priority 3 in the Structural Reform Priorities and contribute to delivering DFID Tanzania's commitment of raising incomes for 563,500 rural households)' (LEAD Business Case, 2013).

4.1.2 Application of M4P principles

LEAD, as a market development programme, aims to increase the productivity of maize in particular through market-based mechanisms. It has two distinct characteristics: 1) in the geographic spread and number of groups formed and 2) in the level of intervention. From the perspective of some of the key informants working in similar areas, LEAD reaches a much larger number of farmers across a large part of Tanzania, resulting in a higher number of producer groups than other similar programmes.

In terms of market development, it focuses at the smallholder level, looking at the development of the relationship between farmers and traders that contribute to the local food economy, as well as looking at the development of markets for those traders. The programme includes initial farmer–local trader linkages, looking to link farmers into larger markets, and considers how to build up those local linkages and develop the chain from traders to larger markets.

It is not clear, however, from a market development perspective, that the programme has clearly identified the market blockages and worked towards overcoming these obstacles. From the programme activities, it appears there are two main obstacles to market-driven implementation in

[7]Planning Commission (1999) The Tanzania Development Vision 2025.
[8]GoT (2001) Agricultural Sector Development Strategy.
[9]Ministry of Finance and Economic Affairs (2010) National Strategy for Growth and Reduction of Poverty II.

both the maize and the poultry markets: the first relates to the provision of information and inputs and the second to smallholder farmer access to markets. The programme has worked towards *overcoming* both through linking traders, agrovets and farmers, but it is not clear whether the programme has actively worked towards *removing* the obstacles – the reason access to these was limited in the first place. Key informant interviews with programme personnel reinforced this finding, with the respondents regularly mentioning their training initiatives targeted on the farmers, but never mentioning any initiative focused on identifying or removing underlying causes of poor agricultural practice. Further, from the ToC, it appears the programme design does not facilitate change within market systems, calling the M4P rationale of the programme into question.

4.2 Impact

4.2.1 Adoption of improved practices

The first process step in the AAER matrix as outlined in the M4P approach (see Section 3.2) is the **adoption** of new practices where the implementing partner 'takes up a pro-poor change that is viable and has concrete plans to continue it in the future'.[10]

	Evaluation questions	Indicators
2.1	To what extent and how have LEAD farmers experienced changes to the use of inputs and new technologies? What impacts have these had? Who is most likely to have experienced the impacts?	- % of LEAD farmers reporting increased use of inputs and new technologies. - Perceptions of impact. - Disaggregation of impacts by gender and type of farmer.

Key findings: *Maize groups report an increase in the application of GAP resulting in higher yields. Poultry groups report an adoption of use of tools for poultry feeding and watering, as well as the uptake of improved feeding and medical care practices resulting in higher prices for their birds. Provision of information regarding good husbandry and agricultural practices has resulted in increased yields allowing for increased consumption of maize within the household and increased prices of sold poultry, with both outcomes adding to increased household resilience.*

4.2.1.1 Poultry

In focus group discussions, respondents reported using both feeders and waterers for their poultry flocks, as well as building hocks[11] to house their flocks, improving their mixture of poultry feed and medicating their flocks against disease plus implementing quarantine practices. Respondents also report an improvement in basic practices such as cleaning chicken hocks. Some farmers who had not directly participated in the LEAD programme also reported these practices, resulting from LEAD participants sharing their knowledge.

There are no reports of other organisations influencing or inputting into the farmers' poultry practices, although there was mention of one other organisation providing credit. The information farmers received from BRAC has led (sometimes with the addition of a loan from BRAC) to changes in the use of inputs, technologies and farming methods, which in turn has led to increases in production.

[10]DFID Operational Guide for Making Markets Work for the Poor (M4P) Approach. 2nd edition.

[11] Some respondents from Ruaha reported that lack of access to capital had prevented them building improved hocks. While there are reports of improvements in housing of flocks, these improvements are unlikely to be large, expensive chicken hocks.

Focus group respondents also reported keeping records of their poultry businesses and of grading their birds (according to size, weight and quality) before selling them.

Interestingly, the LEAD Adoption Survey (February 2016) found that farmers from the second year cohort, with only three months of training at the time of surveying, had a significantly *higher* adoption rate of new technologies than farmers from the first year LEAD cohort. There is evidence that this came from an adaptation of the programme made in the second year. During the first year, groups were formed and General and Lead farmers were trained at the same time. However, during the second year, the Lead farmers were selected and trained first, and General farmers then learnt more quickly, and adopted techniques faster from the demonstration of the Lead farmer.

Uptake of improved poultry practices beyond the LEAD beneficiaries

I know all of them and am aware of what they have learnt and the changes they have made as result of their involvement with LEAD/BRAC. I am attracted to do the same practices and I have already started adopting similar practices.

Non-LEAD poultry farmer, Ruaha.

4.2.1.2 Maize

In 2014 LEAD reported 'there is a high level up take of new sowing method[s] as well as weeding methods…after training'.[12] Similarly, the Midline Report (November 2016) reported continued application of a variety of good agricultural practices, including land preparation, sowing, fertilising, mulching and the application of fertiliser. Focus group participants reported sharing their learning with other non-LEAD farmers, with resulting success in increased production for the latter group.

Primary research reported that there had been a substantial shift among LEAD trained farmers from the reuse of seeds to the use of hybrid seeds and chemical fertilisers, with all trained groups reporting having made this shift. The LEAD Midline Report (November 2016) shows that 15% more treatment farmers bought fertiliser and 10% more bought seeds when compared with control farmers (these differences are statistically significant). Some focus group respondents from Manyoni reported that they could not afford the cost of improved seeds.

There has been limited uptake of improved storage methods. The introduction of Purdue Improved Crop Storage (PICS) bags provides the beneficiaries with a low-cost opportunity to store maize; however, maize farmers view them as an expensive asset. Given that most maize is for household consumption rather than for the wider market, there is little incentive to invest in these storage assets. Some respondents from focus group interviews reported that they had bought one bag, with a view to purchasing more in future seasons. It is not clear from interviews with the PICS supplier as to their promotional or marketing activities whether they will take these insights into their users' experiences into consideration in developing marketing strategies.

LEAD has encouraged farmers to make use of the public sector advisory services (there is no provision of information in the LEAD ToC) but both non-LEAD and LEAD focus groups reported extremely limited access to public sector support in maize production, with some groups reporting having no access at all to relevant agricultural information. Some reported having access to the agricultural extension workers, but the availability of this resource is varied by area, with some having an office they can easily access and some reporting no response to repeated requests for support. While LEAD did not attempt to replace the public sector information services, there appears to be a large gap in the provision of information from the public service. To some extent, LEAD trained agrodealers are filling this gap (see Section 4.3.4)

[12] The EM cannot assess the difference in adoption by gender because the report is missing a key word: 'Female farmers improved in the uptake of weeding practices, use of improved seeds, pesticides and fertilizer application than their male counterparts' (Output 2 Report, 2014, p.16).

4.2.2 Yields

	Evaluation questions	Indicators
2.2	To what extent has farmer adoption of improved practices led to increased yields and quality of produce? What evidence is there that adoption of improved practices can be attributed to the LEAD programme?	- % of farmers reporting increased yields and production. - Proportion of farmers who identify LEAD programme as a key factor in improved practices.

Key finding: *LEAD farmers report increased yields (maize) and flock numbers (poultry). Poultry traders who purchase from these farmers report that birds from LEAD trained farmers are larger and of better quality than those from non-LEAD farmers.*

4.2.2.1 Poultry

In 2016, 83% of poultry farmers reported an increased 'yield' of poultry products (LEAD Annual Report, 2015–16), reinforced by findings in the Midline Report of November2016,which also shows that treatment farmers increased the size of their flocks. Focus group discussions suggest this increase may be attributable to respondents implementing sound husbandry, vaccination and quarantine practices.

Poultry traders reported that the quality of the birds from LEAD trained farmers was better than that of those procured from non-LEAD farmers. This is in spite of LEAD farmers sharing their improved practices with non-LEAD trained neighbours. It is not clear whether the non-LEAD trained farmers were implementing any or all of the reported improved practices. This informal and unsolicited comparison demonstrates the impact of the LEAD practices on the health and resultant value of the poultry

4.2.2.2 Maize

Increased yields from following GAP

[Those] who followed recommended guidelines increased [their] yield from two bags to 8 bags per acre.

LEAD trained female farmer, Manyoni.

In early 2016, overall median maize yields increased for LEAD farmers, from 247kg per hectare at baseline to 1,236kg per hectare at the time of the Adoption Survey (February 2016). The Adoption Survey also found that second year cohort farmers produced 45kg more maize than first year farmers. The LEAD Midline Report (November 2016) shows that, at midline, treatment farmers had a significantly higher yield than control farmers, although in some areas there had been a decline in yields since the baseline, attributable to climatic shocks.

These increased yields have resulted in increased household consumption and increased household food security rather than the surplus sold into the marketplace (see Section 4.2.3). As a result, household funds that would have been allocated to the purchase of food have been redirected to pay for other expenses such as education. Although little maize is traded in the formal markets, maize traders reported an increase in the yields of LEAD trained farmers, stating that yields had increased from 15 bags per acre to about 25 bags per acre.[13]

Some non-LEAD farmers reported seeing their trained neighbours' increases in yields and started following better agricultural practices, demonstrating M4P expansion, albeit on a small scale. A maize trader reported quality increases from both LEAD and non-LEAD trained farmers as a result of his (the dealer's) intervention to train all his clients in maize quality. Similarly, trained maize traders report that they are practising differentiating between maize types and grades. Anecdotal

[13]Key informant interview, LEAD trained maize trader Ruaha.

evidence suggests that sharing this information and skills with farmers has reduced unnecessary transport costs.

This suggests the programme is impacting marginally more on farmers than reported figures reflect.

4.2.3 Access to markets

	Evaluation questions	Indicators
2.3	Is there any evidence that increased access to markets is resulting in increased income from maize or poultry? What factors facilitate or constrain the increase?	- % increase in net income from maize or poultry. - % of producer group members who report increased access to markets. - % of producer group members who cite improved access to markets as a factor in increasing income. - Factors that influence the increase.

Key finding: *LEAD's ToC identifies sales into three possible markets (contract sales, sales into non-local markets and collective marketing). Results show an increase in two of the three (collective selling, sale in non-local markets) for poultry farmers. There is no significant market access reported for maize farmers. Respondents in poultry focus groups reported increases in incomes whereas maize farmers reported that increased yields were mostly consumed within the household. LEAD trained poultry farmers are more likely to report an increase in income from farming than their maize counterparts*

4.2.3.1 Poultry

Increase in bargaining power through collective marketing

The good thing with the group we agreed on a price that gives higher returns and sales. Also, our bargaining power has increased unlike before when we had no poultry group, this has also helped buyers to recognise us as a poultry group.

LEAD trained poultry farmer, Manyoni.

In 2014, only a few poultry farmers (7%) reported selling their products through **collective marketing** and none sold through contract arrangements (Output 1 Report, 2014). In 2016, there was a large increase in poultry farmers selling in **'non-local' markets**–'from 5.9% in year two to 44.39%'; and an increase in sales through contract arrangements to 17% (LEAD Annual Report, 2015–16). LEAD's Midline Report (November2016) shows an increase in collective sales of birds and eggs by treatment farmers from baseline to midline; and at midline treatment farmers' engage in more collective sales of birds than control farmers. FGD respondents also reported this increased collective access to market for birds, although they also said they would sell birds as and when needed to meet household needs.

Poultry farmers reported that they preferred selling collectively with their LEAD trained neighbours and listed several reasons for this, including that individual farmers could not meet poultry traders' demands in terms of numbers and that they felt they received a better price per bird selling in this way. This is reflected in the Midline Report (November2016), which shows a significant increase in mean poultry income from baseline to midline among treatment farmers as compared with control farmers.

Concerning **contract selling** of eggs and poultry, there was no significant difference between changes from baseline to midline for treatment and control farmers.

Increase in market demand

Now there many customers who contact me regularly pressing poultry orders unlike before.

LEAD trained poultry trader, Ruaha.

Poultry farmers reported that they felt they were treated fairly because they were interacting with LEAD trained traders. Farmers reported that they continued to sell birds individually, often to cover family emergencies. Those who had not yet sold collectively expressed an interest in forming a group to sell collectively.

4.2.3.2 Maize

Access to and understanding of maize markets is limited because beneficiaries have limited experience in selling maize into a market. The midline survey and the focus group discussions illustrate that maize yields have increased among beneficiaries. However, focus group discussions reveal that households often consume this surplus or trade within the community. Any additional surplus maize is sold on a very small scale individually into the market, with little consideration or understanding of market dynamics. As a result, there is no significant collective selling of maize and only a small increase (2.9%), as shown in the midline survey. The MTE evaluation did not interview any maize farmer who sold a significant percentage of the harvest into the market.

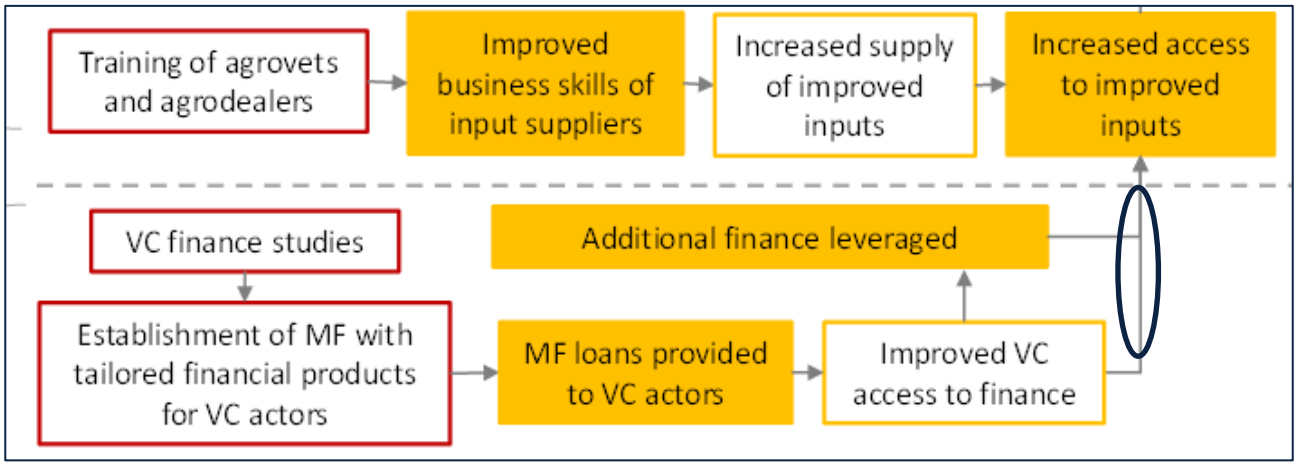
4.2.4 Agrifinance loans

	Evaluation questions	Indicators
2.4	What evidence is there of potential impacts of the use of agrifinance loans? What are the contextual factors that influence how the loans are used and the impacts felt as a result of that use?	- % of loan holders reporting impact of the loan. - Perceptions of impacts of loans and factors influencing those impacts.

Key finding: *Case studies show the use of the agrifinance loans by individual farmers, but there is no data on loan usage across the portfolio of loans in the available documentation. While loans most likely fund the primary purpose of improving farming activity, loan repayments more often draw on other income sources. In some cases, farmers perceive loans negatively, owing to previous experience with microfinance.*

According to LEAD's agri-lending guidelines (2014), loans for poultry and maize farmers are intended to be used for working capital (e.g. purchasing inputs) and expenses such as labour. The LEAD ToC shows a clear linkage between increased access to finance and increased access to improved inputs (see **Error! Reference source not found.**). However, focus group discussions reveal that the potential access to finance may have been a primary driver for farmers to form groups and attend training, but that access to finance itself was not a precondition to accessing agricultural inputs. This may have impacted negatively on the programme's outreach in terms of numbers of farmers adopting improved practices, with farmers accessing loans for alternative purposes.

Figure 3:Extract from LEAD ToC showing linkage between agrifinance access and agricultural input access



While the value of the training and the market linkages are understood and appreciated, post-training some FGD respondents identified 'receiving a loan; as an expectation in forming the groups. However, the rate of take-up of loans differs between groups, with no distinctive pattern to these differences. In some groups all members have taken loans, whereas others have only two or three members with loans. Other focus group respondents reported that they did not actively pursue a loan because they felt the repayment terms were too onerous and did not want to provide their property as security. Maize farmers in Ruaha reported that they would have preferred loans in the form of agricultural inputs rather than money. This would ensure the correct use of finance. The LEAD Annual Report (2015–16) reports similar dissatisfaction with the original repayment terms. This led to the revision of loan repayment terms.

Poultry producers are most likely to benefit from the training, putting lessons into practice to increase quality of the chickens they have, reducing mortality rates quickly so that they can then invest in future production. This is not the case for maize farmers, who need to wait until the end of the season to see any benefit and are dependent on external factors for increased yields.

Focus group discussions revealed that it was not possible to repay many of the loans using the assets that the loan purchased. In other words, if the loan funds purchased layers or maize seed, farmers were unable to use profits from maize or poultry to repay the loan (or at least the first few instalments). The reason given was that the first loan instalment was due too soon after the loan issue, and the purchased asset had not had sufficient time to 'turn a profit'. As a result, borrowers were often dependent on another income source (e.g. home vegetable or market gardens) to make at least the initial loan repayments. Given this alternative income source, there is a possibility that these programme participants are not among the most marginalised, who would have less financial 'depth'.

4.2.5 Unanticipated impact

A core methodology of the LEAD programme is the formation of groups, not only for access to the agrifinance loans but also for instruction in good practice in maize and poultry farming. These community groups have, in some cases, evolved to function beyond their planned purposes. All groups reported benefits experienced through group membership such as mutual support and information sharing, with groups learning techniques and approaches from each other, as well as helping each other when group members experience difficult times (e.g. ill health), organising ceremonies and funerals and so on.

Further, some benefits are more material, with some of the groups reporting that they had set up their own savings system within the group. Group members contribute funds on a weekly basis, sharing the fund with a different group member each week. In some cases, they also contribute to a collective fund used as an emergency fund for group members. In one case, group members had

collectively set up their own business, first contributing to a group saving fund and then purchasing plates and other equipment rented to community members, creating an income stream for the group. Other groups recognise the value of collective support and require members to bring a set amount to each meeting, in the event one of the group members has a need.

A poultry farmer in Ruaha reported starting another business (selling snacks) as a result of saving money from increased poultry sales: 'I have established another business i.e. selling chips after saving money from selling poultry.'

There appears to be no strategy within BRAC to make use of an established relationship between the groups and LEAD to leverage these 'alternative purpose' groups.

4.3 Effectiveness

4.3.1 Private sector linkages

	Evaluation questions	Indicators
3.2	To what extent have proposals to create linkages with private sector partners been successful? What evidence is there of these linkages?	- Number of linkages with private sector partners, and evidence of the linkages.

Key finding: *The need for LEAD to facilitate private sector involvement is not clearly identified in the programme's original design or its supporting documentation. LEAD can evidence activities resulting from about half of its private sector partnerships, most of which involve demonstrations of new products to farmers, and most of which are concentrated in the maize sector. A number of organisations want to learn from LEAD's experience, especially its reach and scale.*

There is no clear indication within the LEAD ToC of the programme facilitating private sector linkages, although the logframe output indicator 4.1 identifies businesses as a source of inputs. In 2014, LEAD formed partnerships with two private sector companies, Yara and Seedco (LEAD Annual Report 2014–15), and increased the number of partnerships to nine in 2015[14] (Quarterly Report, April–June 2015). However, LEAD mentions only four partners in its 2015–16 Annual Report, suggesting that some partnerships (formed by signing MoUs) have not yielded activity to note. In addition, one of the partners in the 2015–16 Annual Report — the International Institute of Tropical Agriculture (IITA) — is a non-profit CGIAR institute and not a private sector actor. The evaluation found evidence of four established private sector partnerships, two with seed companies, one with a research unit and one with a storage bag manufacturer. The seed companies regarded their relationship with LEAD as significant because of the programme's geographic spread of farmer groups and the demonstration farmers. This gives the companies easy access to farmers that they would not otherwise have reached. They also use this network to perform first line market research with the farmers and feed this back into future product development.

While it is likely that these companies will continue to access the farmers with whom they already have a relationship (**Adopt**), it is not clear if they will use the network to introduce other products and services (**Adapt**) or increase these services to other farmers (**Expand**). It is also not clear whether the companies will utilise LEAD insights into the smallholder farmers to adapt their marketing strategies or products and services accordingly.

While mention is made of partnerships with poultry sector companies (Zanchicks and Songwe Chicks Company according to the LEAD Quarterly Report, April–June 2015), the evaluation fieldwork did not include interviews with these companies. There are considerable linkages between poultry farmers and small agro-input suppliers but there appear to be limited private

[14]Yara, Seedco, Export Trading Group (ETG), AGRINFO, IITA, ZANCHICKS, TANSEED International Ltd, Songwe Chicks Company, and Pee Pee Tanzania Ltd (PPTL).

sector linkages with larger, more formal, suppliers in the poultry sector. There were no reported linkages between the input suppliers and the larger, more formal, suppliers.

4.3.2 Farmer training

	Evaluation questions	Indicators
3.3	To what extent and how has farmer training improved farmer knowledge and led to adoption of improved practices and technologies?	- % of farmers trained reporting improved farmer knowledge. - % of farmers trained reporting adoption of improved practices and technologies.

Key finding: *While LEAD training has increased knowledge regarding new practices, there may be barriers to the adoption of new technologies. To some extent, LEAD trained farmers act as proponents of the improved practices and promote these to their neighbours.*

4.3.2.1 Poultry

In LEAD's Adoption Survey (February 2016), a large proportion of farmers from both groups (Year 1 and Year 2 cohorts) indicated they had received training and extension services: 90% each. Results also showed high uptake of improved practices by farmers of both genders (LEAD Annual Report 2015–16). Similarly, focus group discussions indicate that the uptake of new poultry husbandry practise owe to LEAD training (see Section 4.2.1 above).

4.3.2.2 Maize

In LEAD's Adoption Survey (February 2016), 83% of Year 2 farmers and 80% of Year 1 farmers reported they had received training on modern agronomic techniques, and a higher proportion of the Year 1 farmers 'attend the group meetings compared to the farmers who joined the intervention later'. Results show 85% of farmers are using improved inputs (hybrid, quality declared seeds) as opposed to 23% before the project interventions (LEAD Annual Report 2014–15). Similarly, focus group discussions indicate that the uptake of new GAP for maize owes to LEAD training (see Section 4.2.1 above). In both poultry and maize training, focus group discussions revealed that, while training on new practices had been implemented as far as possible, there are some barriers to uptake of the new practices, including capital costs.

4.3.3 Loan disbursement

	Evaluation questions	Indicators
3.4	Who is most likely to use the loans system? How are they using it? What are the enablers/constrainers to using the loans?	- Number of people using the loans system. Disaggregated according to gender, farmer type. - Reports of use, constraints and facilitators to use.

Key finding: *LEAD has exceeded its targets for agrifinance loans disbursement, but available documentation does not contain data on the characteristics of borrowers. Borrowers perceive the given repayment window as unrealistic, especially in a farming context, and are reluctant to provide security for these loans.*

According to LEAD's most recent Annual Report, 11,392 borrowers (6,133 from the maize subsector and 5,259 from the poultry subsector) have received agrifinance loans: the total value of the loans is $2,105,219 ($1,134,906 for maize and $970,313 for poultry) and 119% of the total loans target (LEAD Annual Report 2015–16). Focus group respondents reported that they had used loans for the primary purpose of improving their agricultural income stream, but had had to rely on another income source to make the (initial) loan repayments.

While LEAD has exceeded its logframe targets for loans and value, loans have not always been necessary to grow the agricultural venture, nor always used for their intended purposes (see Section 4.2). Only one respondent within a Manyoni focus group reported receiving and using a

loan to purchase inputs and equipment for poultry farming. Others in the same group reported buying the same inputs more gradually and financing these purchases through the sale of chickens and other income streams (e.g. vegetable sales). In contrast, all the respondents of a second focus group in Manyoni received loans. Some farmers reported using loans for raising poultry while one respondent used her loan to pay school fees and repaid the loan from her established poultry business. A maize farmer in Ruaha reported using the loan to start a brick making business.

While improved access to finance may have had impacts in terms of improved yields as a result of better access to inputs, given money's fungibility, this ToC linkage should have been identified as a high risk. The model might have worked equally well if inputs were provided on credit, although the risk to the lender might have increased significantly.

4.3.4 Training for agrovets, agrodealers and traders

	Evaluation questions	Indicators
3.5	How does training for agrovets, agrodealers and traders influence interactions with farmers?	- Number of agrovets, agrodealers and traders trained. % reporting increased interaction with farmers. - % of farmers reporting increased access with agrovets, agrodealers and traders. - Perceptions of change in interaction from both farmers and agrodealers/vets and traders.

Key finding: *There is evidence that training for agrovets/agrodealers and traders has led to more interactions with farmers. Without exception, both maize and poultry farmers report that they trust the agrovet or dealer that they are in contact with as a result of the training. Poultry farmers report that access to the trader gives them better prices, especially through collective selling.*

LEAD reports training 89 agrovets/agrodealers, 83 poultry traders and 65 maize traders as of March 2016 (LEAD Annual Report 2015–16). Although not quantified, 'the progress monitoring findings showed that all trained agrovet/agrodealers confirmed to have good contact with…lead, general farmers and their groups.' This is supported by the additional reports from the input users that 'they are not only buying quality inputs but also receiving good services from the trained agrovet/agrodealers.' More concretely, in the maize intervention, the LEAD team facilitating links between producers groups and traders found that '87% of the traders were linked with LEAD supported beneficiaries, of which 68% bought maize from the LEAD supported farmers.' There were no reports of similar data for poultry traders.

LEAD connects BRAC-trained traders with farmers, which increases farmers' market access. In addition, other traders are also attracted to the quality and quantity of poultry produced by LEAD producer groups. As a result, BRAC-trained traders have access to a plentiful supply of good quality produce. There is evidence that this is having a positive impact on their ability to sell to larger customer bases. Poultry traders report that, owing to LEAD training, this is attracting more customers.

Agrovets and agrodealers report increased customer numbers as a result of the training, mainly as a result of connections made to producer groups during training. There is also evidence that their customer base increases further as their services are recommended to other non-LEAD farmers.

The training received by traders is helping them understand how best to work with the producers, how to get the best quality products from them and how to price fairly,

Increased sales of quality agricultural inputs

BRAC farmers have been sharing information with non-BRAC farmers who also are now coming to my store. For example, I have been noting changes from neighbours' maize fields, asking for information on where to get similar agricultural inputs.

Agrodealer,Ruaha,

all of which is helpful to producers. Traders report liaising with LEAD farmers to help them understand what they need from producers, and how they can get the best price for the produce. They recognise the value of having such producer groups and, in some cases, tell others about the quality and quantities these groups are producing.

Maize dealers trained by LEAD reported that they had shared quality and GAP learnings with all their clients, whether LEAD trained or not, and said they had seen an increase in the quality of seed sold to them. The difference between the two groups appears to be that the trained farmers request inputs by name, whereas the non-trained clients are less specific about their required needs, often referencing changes in their neighbours' fields.

Focus group respondents reported that they 'chose; their trader or vet after introductions by BRAC and that they trusted them since they had received training from BRAC. Poultry farmers reported that they recognised that they might sell to other non-BRAC related traders, and often did, but valued advice and input from their BRAC trained provider.

4.4 Efficiency

4.4.1 LEAD market facilitation

	Evaluation questions	Indicators
4.1	Do the ways in which the programme supports linkages between producers and traders represent the most efficient approach to delivery? Do the delivery mechanisms used place the programme in the role of a facilitator or service provider?	- % of producers reporting that increased linkages with traders are resulting in increased income. - % of traders reporting increased linkages as a result of the activities of the LEAD programme. - Delivery mechanisms that ensure facilitation vs. those which result in provision of service.

Key finding: *There is evidence of LEAD's role as facilitator of market linkages and improvements in its facilitation approach. However, in terms of training, the initial provision of information and the provision of agrifinance loans, BRAC remains a service provider. It is not yet clear which organisation(s) would assume responsibility for these roles.*

In the Quarterly Report for October–December 2014, LEAD reported that it was introducing maize farmers to new technology through facilitation including, for example, introductions to PICS bags. In poultry, LEAD reported that its market assessments were providing valuable information about supply and demand; however, the Quarterly Report does not explain how it is sharing this information with poultry farmers. The programme currently plays the role of both facilitator (at a micro level) and service provider, and programme managers are concentrating on reducing service provision and increasing facilitation in the final months of the programme. However, groups are still quite reliant on programme officers for information and support, partly because of the lack of availability of support from government agricultural extension officers. This provision differs from place to place. However, in most cases access is limited. Focus groups report that programme officers are sometimes available and contactable by phone. Some attend regular community meetings to feed information into the groups and answer questions. Government agricultural extension officers usually work over huge areas and are unable to provide the same level of service.

The facilitation role of the programme is much clearer in relation to traders, agrodealers and agrovets. Once these linkages have been set up, the programme then plays little or no role in ensuring these relationships continue. The programme also facilitates relationships between private sector partners and other stakeholders, with the programme setting up workshops and meetings during which people can meet and make their own interactions work.

As a result of providing extensive services and not acting as a facilitator, there is a significant risk of the programme momentum ending as soon as the programme closes. In spite of efforts to partner with other organisations, it is not clear is any organisation will accept responsibility for the various programme components without a dedicated funding source.

4.4.2 LEAD Investment Fund

	Evaluation questions	Indicators
4.2	Are the gaps identified in the value chain being addressed by the approach to facilitating investment in targeted areas? What evidence is there of outcomes from investments made by the investment funds? What is hindering or helping it to happen?	- Number of investment fund grantees. - Proportion of those grantees reporting outcomes. - Perceptions of the process. - Mapping of value chain gaps to investments made.

Key finding: *Grant outcome data areshowing significant increases in income, assets and business involvement among grantees. LEAD producers groups are benefiting from interaction with grantees, as are other smallholder farmers in the value chain. Specific interviews within the poultry market reported that the Investment Fund had allowed clients to directly contribute to the value chain and to extend services beyond the scope of LEAD trained farmers.*

The investment fund is open to agribusiness investment in the poultry and maize subsector in Tanzania. The fund is a combination of a grant (40% of the amount) and loan (60% of the amount). Businesses can apply for capital of between $5,000 and $30,000, but the requested value should not be more than 50% of the value of the current investment of the business. The highest percentage of funds disbursed is to the poultry sector, with 48% of funds going to hatcheries and 14% to agrovets[15]. The remainder goes to feed millers, food processors and seed companies.

The Investment Fund manager makes the final decision on the loan amount following a site visit. Overall, entrepreneurs received on average 21% less than the amount requested; 57% of the entrepreneurs were not happy with this decision and subsequently requested further funds, which were not given[16]. The LEAD Investment Fund managers felt that many entrepreneurs were requesting amounts that they would be unable to repay.

Table 4: Business growth following LEAD Investment

Income	Before funding	After funding	%change
Average monthly income (Tsh.)	3,671,429	7,302,000	99%
Monthly production			
Day old chicks production by hatchery (no.)	24,280	49,100	103%
Poultry feed production by miller (kg)	60,600	122,550	102%
Food production by food processor (kg)	700	1,500	114%
Seed production by seed company (kg)	10,000	50,000	400%
DOC production by poultry farm (no.)	1,700	4,300	153%
Asset			
Average asset value	50,552,857	105,558,571	109%

A BRAC study exploring the effectiveness of the Investment Fund (August 2016) shows large increases in income, production and assets as a result of the use of the loan, with seed companies

[15]BRAC (August 2016). Study on the Effectiveness of the Investment Fund.
[16]Ibid.

seeing the largest increase in production (although only 5% of fund recipients are seed companies).

Key informant interviews reinforced evidence of this growth, including with two Investment Fund holders, both in the poultry value chain and both involving hatcheries. In both cases, the Investment Fund has allowed the businesses to expand substantially, to the extent where they are able to continue to expand to meet the needs of their customer base. One of the fund recipients has developed a new hatchery business and has more demand than he can meet. He works closely with LEAD producer groups, meeting them during their training and then continuing a relationship with them in which they sell eggs to him and he sells them chicks. He also provides the producer groups with advice and support to ensure they can keep the chicks healthily; however, he reported that the LEAD-trained farmers had sufficient knowledge to raise chicks well. Over time, his customer base has grown beyond the producer groups so that he now sells more widely to non-LEAD farmers, with many LEAD farmers giving his name to non-LEAD farmers. With the non-LEAD farmers he provides advice and support that is more extensive, using the same methods taught to the LEAD farmers. He reports these farmers are producing better quality chickens in higher numbers. He is now looking for additional funding to grow the business, as he currently has to sell all of his day-old chicks when he would like to be able to keep some to rear and sell at a later age.

Increased production and employment through the LEAD Investment Fund

One poultry trader used the Investment Fund finance to buy new hatchery equipment and '*started to produce 3,000 chicks [per month]… He increased his income from [TSh] 400,000 to [TSh] 5,000,000 per month [and] has been able to employ three labourers*.'

LEAD Quarterly Report, October–December 2015.

The other fund-recipient has used the finance to expand the capacity of his existing hatchery and to add an agrovet business. The premises have doubled in size and his business is extremely busy. He works with the producer groups and provides most of the groups in the area with inputs and chicks as well as with non-LEAD farmers.

There is also evidence of a significant increase in the number of buyers and sellers, including both LEAD and non-LEAD farmers, with new customers most likely to be non-LEAD farmers. A total of 67% of entrepreneurs reported good contacts with LEAD producer groups, regularly buying and selling agro-products to farmers and providing technical support to them when needed. For the remaining 33%, the volume of interactions with farmers is so high that it is difficult for them to have direct links with LEAD farmers.

In terms of challenges faced within the fund system, many of the entrepreneurs requested further grants and were not aware that any second round would have to be purely loan without any grant component. LEAD are working on this issue with the entrepreneurs to help them access loans where required.

The programme has shown that there is significant investment opportunity within the sectors, if this is provided on favourable terms and structured with business advice and guidance. However, LEAD's tendency to provide service rather than facilitate the same will leave a vacuum when the programme closes, unless it identifies an organisation willing to venture into this area.

4.4.3 LEAD's organisational structure

	Evaluation questions	Indicators
4.3	How has the organisational structure supported or hindered the efficient delivery of the programme? How do the different layers of the organisation communicate with each other? What are the outcomes of this communication? Where are the bottlenecks? What are the facilitators?	- Mapping of organisational structure to delivery mechanisms. - % of staff members who cite organisational structure as supporting the delivery of the programme. - % reporting organisational structure as bottleneck to delivery. - Perceptions of efficiency of delivery and links with organisational structure. - Evidence of bottlenecks and facilitators to communication.

Key finding: *LEAD can demonstrate use of effective communication methods within the team. The biggest organisational challenge LEAD faces is high staff turnover. There appears to be limited opportunity for local staff to initiate suggestions for change or improvement, entrenching service delivery rather than promoting market innovation.*

The LEAD programme has many layers to its organisational structure and planning, with good communication between different layers cited by most employees as being central to the efficient delivery of the programme. The Inception Report (January 2014) lays out the programme structure. BRAC Tanzania implements the programme with support from BRAC HQ in Bangladesh. The LEAD project manager is responsible for strategic decisions and the DFID adviser provides technical oversight. The Inception Report highlights the importance of effective communications between the country office and field-level staff, and describes the methods of achieving this communication: for example through monthly and quarterly meetings, regular field visits, monthly reporting and weekly phone calls. LEAD's 2014–15 Annual Report mentions that monthly coordination meetings with field staff are informing programmatic decisions and revisions to the monthly reporting format, and improving coordination between different teams. As such, these meetings appear to enable effective communication.

The existence of monthly plans, agreed between programme officers and area coordinators, provides the basis for the work done by programme officers. The plans set out targets for group numbers and production, training sessions and other support interactions. Once this plan is set, however, there appears to be limited flexibility within it, with programme officers having to report against that plan at the next monthly meeting rather than making changes as they go along. However, the monthly meetings provide the opportunity to report on any problems faced in meeting the plan, making changes for subsequent months. The programme officers are also in very close contact with area coordinators to feed back any problems faced and get support and advice as needed.

There is also very little flexibility in the provision of credit facilities, with the local BRAC office unable to respond to requests from farmers for a grace period to allow borrowers to repay their loan from their agricultural venture. The BRAC model has been extremely successful in Bangladesh but it is not clear if the organisation has contemplated adjusting the way it provides credit to the local circumstances in Tanzania.

According to interviews with programme officers and area coordinators, access to free mobile phone services (staff have BRAC-issued phones) means staff can always contact each other, and staff see this as very important, with most communication taking place through phone calls.

4.4.4 Measuring value for money

	Evaluation questions	Indicators
4.4	Does LEAD have effective systems and criteria to ensure VFM in planning, delivery and project management? - How could these be improved (if at all)? - What evidence is there that VFM in terms of delivery is being maximised?	- Existence of systems to map VFM. - Evidence of use of staffing and extension costs in programme management. - Evidence of understanding of key cost areas amongst management staff.

Key finding: *Reporting is inconsistent against VFM and LEAD does not have clear systems in place to capture VFM data. By improving the type of data LEAD collects and by addressing its staffing model, VFM might improve. The programme appears to perform better than other programmes in some areas, and in other areas does not give as much value.*

The LEAD Business Case (2013) outlines the indicators for assessing the programme's VFM according to the 'three Es': Economy, Efficiency and Effectiveness. Some of these indicators are already included in LEAD's logframe, such as 'number of rural households benefiting in terms of increases in net income', 'adoption rate of new agronomy practices' and 'repayment rates on loans'. The Business Case does not include measurement against a fourth 'E' (Equity) despite the programme incorporating gender issues.

VFM is otherwise absent in LEAD's design documents and there is no explicit mention in LEAD's Performance Monitoring Plan (Updated 2015) or Inception Report (January 2014). There is no discussion of VFM in the LEAD Quarterly Reports or the 2014–15 Annual Report. The only data gleaned are data reported against the logframe outcomes and outputs as noted above. There is one instance of LEAD self-reporting on VFM in its 2015–16 Annual Report where LEAD reports against all VFM indicators provided in the Business Case, except for 'private sector investment leveraged' and 'repayment rate on loans'. While the report describes 'businesses operating in unserved areas,' this is not quantified. DFID's 2015 and 2016 Annual Reviews include detailed sections on LEAD's VFM. The 2015 Annual Review mentions the lack of reporting by LEAD on investment leveraged, and the 2016 Review clarifies that this indicator is intended to capture LEAD's ability to 'leverage commitments from the Project Investment Fund'.

Both the 2015 and 2015 DFID Annual Reviews note that LEAD's high administrative costs are in keeping with expectations for an M4P programme. The 2016 DFID Annual Review suggests that LEAD's staffing model may not be offering VFM.

The MTE has reviewed the existing LEAD VFM indicators (outlined in the MTE design document) and has calculated updated VFM metrics against these indicators where data are available. Where data are not available at this stage, we highlight how the programme can continue to develop the VFM system, and in some cases calculate alternative VFM indicators based on available data.

4.4.4.1 Economy

Fees typically comprise a significant proportion of total costs in an M4P programme. At the level of economy, the MTE has reviewed programme data availability to calculate VFM metrics and to identify appropriate additional VFM indicators to track VFM performance and to make suitable comparisons with other programmes where appropriate.

Existing indicators: LEAD initially identified three economy indicators to track:

- Ratio of facilitation costs (including training and direct service delivery) to overhead costs.
- Ratio of training days delivered by external consultancy support to in-house staff.
- Average fee costs for national and international consultants.

Data are available to track the average fee rates of national and international consultants, calculated as £343 and £406, respectively. These costs are relatively low in comparison with in other programmes, in particular M4P programmes. No data are available on the average costs of internal LEAD staff. The programme should consider tracking this information in addition to the average costs of external consultants, given the relatively limited use of consultants.

Insufficient data are available to calculate the ratio of training days delivered by in-house staff to external organisations. The programme should consider tracking this metric if it is a relevant indicator of its sustainability or scale strategy, moving training activities from internal staff to external organisations over time.

The MTE has not calculated the ratio of facilitation costs as initially envisaged. Instead, in order to increase comparability with other programmes, the MTE has calculated the percentage of overhead costs to total programme costs. Calculation of overheads includes management and head office logistics costs as well as in-country staff costs not attributable to either livestock or agriculture activities. The percentage of overhead is 15.6% (overhead costs were £1,292,865 out of total programme spend of £8,313,642). This is slightly high but broadly in line with other similar programmes.

4.4.4.2 Efficiency

The MTE has explored the efficiency with which the programme translates inputs into outputs. The MTE has reviewed programme data availability to calculate VFM metrics and make suitable comparisons with other programmes as appropriate.

Existing indicators: LEAD initially identified four efficiency indicators to track:

- Programme cost per £1 of loan disbursed.
- Programme cost per £1 of private investment leveraged by the investment facility.
- Cost per farmer adopting specific management techniques and technologies.
- Cost per producer group formed and functional/

Data are available to track the majority of these indicators. The total programme cost per £1 of loan disbursed is £18.50 (the programme disbursed £448,399 of loans, with a total programme cost of £8,313,642). We use total programme cost because the VFM system currently does not currently allow the total cost of particular programme components to be calculated. By making some assumptions, it is possible to estimate the cost of the loan component as £5,439,361 (this includes total programme staffing costs and overheads, as well as half of the M&E and advocacy costs, but does not include costs associated with farmer training or investment and capital expenditure). This produces a revised component cost of £12.10 per £1 of loan disbursed. The total programme cost per £1 of private investment leveraged in the form of matching contributions by investment fund entrepreneurs is £11.40 (private investors contributed £727,409 whereas total programme costs were £8,313,642). The cost per producer group formed is £1,037 (note: no data are available at this stage on whether these groups are functional). The programme should explore further ways to extend the VFM system to calculate the costs of particular components.

No data are available on the number of farmers adopting specific techniques and technologies. This information may be extrapolated from the LEAD Midline Report, where proxies for ‘specific techniques and technologies’ are identified in the reporting. At this stage, the cost per farmer trained calculated from the available data is £78. Whilst direct comparison across programmes is difficult it is noted that this is higher than some comparable programmes, for example for the Food Trade Eastern and Southern Africa DFID funded project the comparable figure is £47.74

A further efficiency indicator that the programme could track and compare with other programmes is the leverage ratio, which calculates the ratio of private sector investment to the investment provided by the programme. LEAD’s leverage ratio is currently 1.1.61 (LEAD disbursed £451,641

from its Investment Fund and private enterprises matched this with £727,409). This leverage ratio is 'mid-ranged' – that is, it is not as high as some grant giving programmes but higher than others.

4.4.4.3 Effectiveness

Limited data are available at this stage to calculate the cost effectiveness with which the programme translates outputs into programme outcomes and impacts.

Existing indicators: LEAD initially identified three cost effectiveness indicators to track:

- Cost per farmer reporting a 10% increase in income (if possible, ratio of total programme cost to total net additional income above baseline reported by farmers).
- Programme cost per poorer households (self-reporting at baseline as 'very poor' or having 'below average wealth') reporting positive improvement in wealth status.
- Programme cost per household self-reporting improved access to sufficient basic food items (in previous four weeks, over baseline).

The recent midline survey data do not align directly with the existing effectiveness VFM indicators outlined above. However, the survey may potentially inform calculations of the following revised indicators in the future:

- Programme cost per farmer (net) no longer reporting **below average wealth compared with other community members** (difference-in-difference effect compared with control group). The midline survey report did not indicate whether respondents were asked if they had a positive improvement in wealth status but indicated that farmers were asked if they had below average wealth compared with other community members. The difference-in-difference effect for poultry and maize farmers reported was not significant.
- Programme cost per farmer (net) no longer reporting **insufficient access to food in the previous four weeks** (difference-in-difference effect compared with control group). The midline survey report did not indicate whether respondents were asked if they had improved access to sufficient basic food items but indicated that they were asked if they had experienced insufficient access to food in the previous weeks. The difference-in-difference effect for maize farmers is insignificant and for poultry farmers is significant but negative.

The midline survey report did not report on the number of farmers reporting a 10% increase in income. No data are available at this stage for two additional effectiveness metrics identified in the last DFID Annual Review: the number of business starting operations in unserved areas and changes to marketing dividend for farmers (the latter having some anecdotal evidence). LEAD should review data availability for these indicators to calculate the programme cost per business starting operations in unserved areas and ratio of programme cost to aggregate marketing dividend.

4.5 Governance

	Evaluation questions	Indicators
5.1	How has programme learning and adaptation been facilitated or constrained by programme and governance arrangements? How has the wider organisational (BRAC) governance system impacted on programme adaptation?	- Links between decisions made at governance meeting and adaptations to programme. - Links between BRAC governance and programme decision-making.

Key finding: *DFID has critiqued LEAD for its hierarchical management structure. Reports of LEAD's fora for staff discussion, and other changes, indicate LEAD is attempting to make improvements and become more adaptive. While BRAC may be more adaptive to staff-centred*

requests, there appears to be little leeway or encouraging of staff suggestions for programme adaptation or improvement.

DFID Annual Reviews have critiqued LEAD's 'vertical management structure' (Annual Review 2014), and the 2015 Annual Review concluded that LEAD needed to become more adaptive and iterative in its approach, and, as part of this, management needed to make more visits to the field. LEAD responded to this critique in its 2015–16 Annual Report, stating that 'field missions are enhanced to ensure that the decisions that are being made are informed by the actual field situations.' In addition, in DFID's 2016 Annual Review, the reviewer reports that senior management is aware of the need to be more adaptive but its 'hierarchical' approach to management persists.

The organisation and its resulting system is target driven, and there is little scope for programme innovation or adaptation at programme organiser and area coordinator level. While this makes it easier to track programme performance it also hinders programme responsiveness and adaptation, which should characterise a market development programme.

4.6 Sustainability

4.6.1 Sustainability of facilitation workshops

	Evaluation questions	Indicators
6.3	What evidence is there of sustainable outcomes of the facilitation workshops? To what extent is this approach welcomed by stakeholders?	- Proportion of workshop attendees reporting ongoing new market activity initiated by of the workshop. - Perceptions of the workshops including process and reports of outcomes.

Key finding: *Workshops fill an important role in enabling the sharing of information from LEAD's market assessments, and LEAD report that participants have expressed interest in continuing to work on their own. . Farmer groups agree they will continue to work together. There are concerns about the expansion of the programme process beyond the targeted and identified beneficiaries.*

Facilitation workshops are providing a forum for sharing information in LEAD's market assessments with market stakeholders (Quarterly Report January–March 2015), thereby addressing a critique in DFID's 2015 Annual Review that dissemination of this information was inadequate (see Section 4.1). LEAD reports on these workshops regularly, in both Annual Reports and all Quarterly Reports since the workshops began in October–December 2014. However, the descriptions of these workshops repeat the same information, from one report to the next. For example, they all state that 'during the workshop in most cases, the key actors formed a working group to avail the opportunities, address key constraints and way forward to upgrade the local value chain of maize or poultry' (Quarterly Report April–June 2015). Subsequent reports do not contain any information on whether or not these working groups have continued to function. However, the latest Quarterly Report (July–September 2015) states that, 'as a result of this course and stimulation, LEAD farmers are accessing quality inputs and services, conversing with known buyers for selling their products and also receiving extension agencies from the local relevant government and other departments.' However, there is no supporting evidence (specific examples, quantitative data, etc.). Instead, the focus of reporting is on the number of workshops held and the number of attendees each quarter (e.g. 'in this reporting quarter, 12 value chain facilitation workshops were conducted…a total 323 participants (186 male and 137 women)…attended' (Quarterly Report October–December 2015)). There are no data on the outcomes of these workshops.

The key informant interviews have provided some limited evidence on stakeholder views about the workshops, but again little concrete evidence of outcomes. Stakeholders who attended the workshops were very positive, reporting that the links made were fruitful and useful. For example,

the seed company director found it valuable to meet with farmers and discuss their needs and problems they face, the investment fund recipient found it valuable to network with farmers, and the agrodealer valued meeting seed companies and making a contact for purchasing seeds. These links have helped these particular stakeholders improve how they play their role in the value chain. There is evidence that the workshops are bringing different market actors together; however, there is little evidence of the use of the market information provided.

The programme is resulting in improved interaction between producers and buyers as a result of relationships established by the LEAD programme, with traders and farmers introduced during training sessions. It would appear that these relationships are then continuing with no, or very little, input from the programme staff, particularly among poultry farmers. Farmers in focus groups said they had their own relationships with traders, often facilitated by lead farmers within the group, but with all farmers having their own access to the traders (by having their mobile phone numbers).

For farmers, trust is the most important element of these relationships. They reported they trusted these traders because they received training from BRAC and therefore treated the producers well, offering good prices for their produce, as well as giving them advice about how to make their produce more sellable. Poultry farmers reported that LEAD-trained traders were more likely to give them a good price than other traders.

However, it is not clear from the evidence that the benefits of the programme will spread beyond the current facilitated reach of the programme. While the trained traders, agrovets, and farmers are likely to continue their market-driven relationships, and some of these benefits will spread to non-LEAD trained farmers, there is a question about whether the benefits of provision of information and training will spread from the LEAD traders and agrovets to other non-LEAD trained businesses further up the value chain. From a market development perspective, this may be one initial barrier they need to overcome and it is not clear whether the programme has made plans to achieve this.

4.6.2 Sustainability of farmers' groups

	Evaluation questions	Indicators
6.4	What evidence is there of dynamics within farmers groups that will ensure sustainability? What are these? How do they work?	- Proportion of farmer's groups with plans to continue meeting and interacting post March 2017. - Proportion of farmer's groups with activities not initiated or organised by the LEAD organiser. - Proportion of farmer's groups with their own links to other organisations that will help ensure sustainability. - Perceptions of what is needed to ensure sustainability.

Key finding: *Farmers perceive added value in cooperating for farming purposes and for mutual support in terms of personal issues, as evidenced through the formation of other group-centred structures. Poultry groups in particular report value in collective marketing of their produce.*

Attendees at the focus groups stated that they would continue to work together in the future, even without a programme officer present. The main reason for this is that they feel the benefits of working together in terms of both interpersonal relations and social capital as well as economic benefits. This sense of value in working together has led some groups to form their own savings groups and businesses, as reported above. Many of the groups talk of becoming 'formalised' in the future, writing a constitution so that they can then access government services and credit.

In terms of social capital, group membership is helping farmers obtain support around a range of issues, not just farming, but also in times of ill health, celebration and financial problems. They are also sharing information, knowledge and problem solving, helping each other if they have problems with their crops or poultry or if they fail to understand completely the training received. Focus group respondents reported having built a trust relationship.

In addition, there is evidence (in the form of better prices and collaborative businesses) that they are receiving financial benefits from working together, with increases in yield, market access and subsequent financial income. Importantly, they also felt that, by being in a group, they could more easily access loans and other services (even if they have not yet done so). There is a sense from group members that there is strength in numbers, and that they are more likely to be able to get the attention of government agricultural extension officers for example, by being in a group.

4.7 Crosscutting issues

4.7.1 Monitoring and adaptation

	Evaluation questions	Indicators
7.1	(Monitoring) Is the monitoring system enabling staff to be suitably reactive?	- Evidence of adaptations made as a result of the monitoring system.

Key finding: *There are some examples of LEAD taking action on monitoring findings, but the evidence does not suggest that this always happens. LEAD's Performance Monitoring Plan does not give guidance on how monitoring data can be used to inform programmatic changes. There is limited opportunity for country-based staff to interpret data and suggest appropriate responses.*

There is no mention of using monitoring data for learning and adaptation in LEAD's Performance Monitoring Plans (PMPs) (either in the 2014 original plan or in the 2015 revised PMP). Despite this, there have been instances were findings from LEAD's monitoring activities have led to learning and adaptation in the programme. For example, where attendance at producer groups is low, staff will intervene and attend the meetings to 'fast track' these groups (Output 1 Report, 2014). There is also an example of monitoring of the investment fund recipients highlighting their need for capacity-building training. Subsequently, LEAD began talks with the firm Match Maker Associates to provide training (Quarterly Report July–September 2015), which was delivered to eight entrepreneurs (LEAD Annual Report 2015–16).

There were other examples from the documents in which monitoring revealed new learning, but it is unclear if there was any follow-up action. For example, research conducted for the Output 2 Report (2014) found poultry farmers wanted more days of training and 'refresher training', but it is not clear if these suggestions were implemented in future training plans. Investment Fund monitoring showed 'entrepreneurs would have greatly preferred and possibly also benefitted from a grace period before their first repayment instalment and from flexible repayment times beyond just 12 months' (LEAD Annual Report 2014–15). In this same report LEAD writes they will 'take into consideration these suggestions for the 1st round of the Investment Fund', but there is no reference to changes in the repayment model in Quarterly Reports for April–June 2015 or July–September 2015. Lastly, the findings from monitoring visits to demonstration farmers led the monitoring team to conclude that more women and youth should be encouraged to become involved in maize farming (Quarterly Report April–June 2015), but there was no evidence of this suggested strategy being implemented in the subsequent Quarterly Report (July–September 2015).

Monitoring and evaluation work (M&E) appears to be working in organisational silos, with the qualitative and quantitative data captured and reported by different staff who appear to see limited value in communicating their findings. An adaptation in this process or at least triangulation and synthesis of sources of information may allow the programme to interpret more robust data and analysis and better identify any potential areas for improvement.

The document review outlines examples of how the monitoring system is used, or not, to make changes. The monitoring system is made up of a mixture of quantitative ongoing data collection (e.g. number of groups formed, number of farmers trained), which is supplemented by more in-depth qualitative information that has been collected against each of the four outcome areas. The

qualitative information emerging from the M&E system is in-depth and detailed, taking considerable time to collect, analyse and write up. As a result, acting on the findings does not happen rapidly and use at the field level is limited.

It is not clear to what extent the monitoring data inform and influence programme decisions, with the qualitative and quantitative programme monitoring appearing to work in organisational silos. The information appears to inform decision-making by senior management and Bangladeshi-based BRAC personnel but it is not clear to what extent they explain the rationale or decision-making process to local staff, negatively affecting organisational sustainability.

4.7.2 Monitoring quality

	Evaluation questions	Indicators
7.2	(Monitoring) Are M&E systems working and robust – are they likely to provide appropriate information for the final evaluation?	- Degree to which M&E systems are operational and generating evidence for decision making - Agreement between LEAD monitoring system data generation and the data needs for the final evaluation.

Key finding: *LEAD's reporting is regular and comprehensive with respect to reporting against the logframe. There is little reporting linking activities with outcomes or follow-up actions.*

LEAD's reporting is consistent, comprehensive and generally of good quality, with a few exceptions such as discrepancies in figures as noted in earlier sections. All of LEAD's Annual Reports and Quarterly Reports contain reporting against the output levels of LEAD's logframe as well as some data on LEAD's outcomes. Two Output Reports (Output 1 Report 2014 and Output 2 Report 2014) and the Adoption Survey (2016) supplement output data. Outcome and impact data were collected at baseline (Baseline Report 2014) and a follow-up survey will take place in 2016 (LEAD Annual Report 2015–16). In addition, LEAD's Quarterly Reports often contain case studies profiling individual programme participants (e.g. Quarterly Report October–December 2015), providing an important 'on-the-ground' perspective of the programme. The biggest gap in LEAD's reporting, as noted in Section 4.4, is Value for Money. Another gap in LEAD's reporting data is in 'follow-up' beyond the activity level and beyond what LEAD is required to report against in its logframe. Ultimately, we want to know the outcomes of these activities and the sustainability of these results.

4.7.3 Inclusion: Poverty

	Evaluation questions	Indicators
7.3	(Social and poverty focus): What evidence is there that the programme is reaching the most marginalised farmers? What elements of the programme are ensuring that the most marginalised farmers are finding new relationships within the market system?	- Proportion of marginalised LEAD farmers categorised as marginalised. - Proportion of LEAD farmer group membership selected according to criteria to ensure inclusion of most marginalised. - Relationship between programme elements and targeting.

Key finding: *LEAD's survey results indicate that participant farmers can be classified as subsistence smallholder farmers; however, it is not clear if or how LEAD is including the most marginalised within this demographic.*

LEAD reports programme participants as 'poor' and lacking access to services. LEAD reports in all regions where it operates that unemployment is high, there is a lack of linkages between smallholder producers and the market and, in some areas, there are insufficient extension services (LEAD Annual Reports2014–15 and 2015–16).

There is some evidence that LEAD participants are 'poor' subsistence farmers. The LEAD Adoption Survey (2016), for example, shows that only 3% of poultry farmers and 1% of maize farmers have at least secondary education. The LEAD Baseline Report (2014) refers to maize farmers' land size, and finds farmers in the treatment group 'use 1.75 acres of land for cultivation out of a total 2.63 acres.' In addition 'the expected income based on a fixed seasonal price of maize for the last season is around USD112 per season'; 'the sample farmers are mostly subsistence farmers who basically produce for themselves'; and only '21% of treatment group feel they get a fair price for maize'. For poultry 'the average yearly income from selling eggs would be TSh 231,200 (US$136)'; and 'the poultry farmers are mostly subsistence farmers who mainly produce for home consumption.'

The targeting of the programme is difficult to unravel, as the selection of group members seems to happen differently in different areas. There is an initial visit to an area by programme officers to identify farmers who might be suitable – but a lack of clarity as to what this means. Target areas are within close proximity to a BRAC branch office, which means no farmers are in remote locations. There is recognition that the programme is not aiming at reaching the extreme poor, because the programme is building on existing farming practices, which means farmers must already have land or some way of keeping poultry.

However, when forming groups, in some cases the programme officer has selected members themselves, whereas in other cases the programme officer has found one lead farmer and has then asked them to form a group. In these cases, the lead farmer tends to select his or her nearest neighbours (i.e. people who farm nearby) with no consideration of level of poverty or marginalisation.

The 2016 DFID Annual Review states that LEAD does not adequately target poverty when forming producer groups. LEAD's most recent progress report (Annual Report 2015–16) does not mention criteria for the formation of these producer groups.

4.7.4 Gender

	Evaluation questions	Indicators
7.4	(Gender) To what extent is the programme demonstrating an understanding of the different factors that influence how men and women interact with markets? What are those factors?	- Evidence of gender analysis feeding into programme design and adaptation. - Staff perceptions of factors that influence the differences in how men and women interact with markets.

Key findings: *LEAD conducted gender analysis revealing the different experiences of men and women farmers, but it is not clear how this analysis is feeding into programming. Both men and women are involved in maize farming, while more women (and some older men) appear to be involved in poultry farming. It is not clear why women maize farmers earn less than their male counterparts do.*

LEAD's Business Case (2013) emphasises the importance of gender analysis, and the need to monitor gender dynamics within households. To do so would require an in-depth investigation into changes in women's decision-making power at the household level. The available documentation does not suggest that LEAD is doing this. LEAD's PMP (revised 2015) mentions gender dynamics in the context of household food security, stating that there is an assumption 'that an increase in productivity and net incomes will lead to improved food security for households…the evidence for this is mixed and can rely on gender dynamics within households…. this will be a key evaluation question.' The PMP states that LEAD will gender disaggregate the data it collects, and this has happened, as evidenced by the demographic data presented in LEAD's various reports.

In the poultry value chain, LEAD has made efforts to recruit women producers, and women comprised 79% of participating poultry farmers at the time of reporting in LEAD's Output 2 Report (2014). LEAD found that women primarily produce and sell eggs, whereas men primarily rear and

sell birds (LEAD Annual Report 2015–16). It is not clear if this finding has effected any changes in LEAD programming, such as more of a focus on egg sales.

In the maize value chain, LEAD's Business Case (2013) reported that 53% of women in Tanzania grew maize, as compared with 25% of men. Yet, during LEAD monitoring visits to maize demonstration farmers, the findings showed that 63% of these farmers were men (LEAD Quarterly Report April–June 2015). The report recommends that LEAD 'encourage more women in maize cultivation to improve their participation in this sector,' although if the Business Case statistics are correct, it suggests LEAD needs to recruit more women as demonstration farmers. LEAD's Annual Report for 2015–16 shares findings that, although women produce and sell more maize than men do, they earn less for their efforts. LEAD offers a few hypotheses as to why this might be the case, such as '[more] expenses of inputs incurred by female farmers compared to male, or else male farmers have more bargaining powers on sale compared to female farmers.' However, it is not clear whether and how this finding will feed into LEAD programming or if further research will test these hypotheses.

Lastly, at the trader level, in both the poultry and maize sector, traders and agrovets/agrodealers participating in the programme are primarily male (LEAD Annual Report 2014–15). Although this may be by virtue of the demographics of traders in these sectors overall, LEAD does not explain if this gender ratio is desirable, or if they will make efforts to recruit more women.

4.8 Lesson learning

	Evaluation questions	Indicators
8.1	(Synergies with other interventions) Has LEAD interacted with other similar programmes in Tanzania, or learnt from other programmes elsewhere, and if so how has this improved programme delivery or results? Are other programmes learning from LEAD? What examples are there?	- Evidence of interaction with other programmes and of learning feeding into the programme. - Evidence of other programmes learning from LEAD.

Key finding: *LEAD has engaged with many similar programmes to share learning. The most concrete examples of the effect of this on LEAD programming is LEAD's partnership with PPTL and with the One Acre Fund.*

4.8.1 General

LEAD has shared learning with other programmes involved in market systems development, agricultural value chains and agri-finance. In Feb 2015, LEAD management attended a workshop hosted by the BEAM Exchange, Gatsby Foundation and Aga Khan Foundation (AKF) to bring together representatives from 17 different programmes 'to explore challenges, lessons learned, and emerging solutions related to their practical work of applying market system approaches' (LEAD Annual Report, 2014-2015). Here the discussion included 'market assessment and awareness, effective interventions, working with businesses, working with marginalized groups, scaling up, and replication'.

In the field of agricultural value chains, in July 2015 LEAD management attended a meeting for 'a Consortium of Implementing Partnerships in Structuring Maize and Beans Value Chains and Markets in East Africa' as part of DFID's FoodTrade East and Southern Africa (FTESA) programme (QR July-Sept 2015). LEAD also reported communicating with the World Food Programme (WFP) about its Patient Procurement Platform (PPP), funded by FTESA, 'regarding extension of services delivery to maize smallholder farmers' (LEAD AR 2015-2016). This engagement with FTESA did not continue, as LEAD withdrew from the consortium 'due to lack of available information from the funding organization' (QR Oct-Dec 2015).

LEAD has a firm partnership with Pee Pee Tanzania Ltd (PPTL), a FTESA grantee, and PPTL has launched its PICS bags for quality harvest and storage of maize for smallholder farmers in a LEAD branch (LEAD AR 2015-2016). Finally, a LEAD regional coordinator also attended a CABI event on 'common bean cultivation' (QR April-June 2015), but it is unclear as to how this event related to either of LEAD's value chains.

In the field of agri-finance, LEAD has visited Aga Khan Foundation's Coastal Rural Support Programme, a programme that, like LEAD, works on agriculture, food security, and 'engaging the private sector and in microfinance' (QR July-Sept 2014). LEAD reports that this meeting 'helped [the] BRAC team to learn about AKF's training approaches, extension methodologies, private sector engagement, progress monitoring, and overall management of staff retention.' The most concrete example of collaboration so far is with the One Acre Fund, with whom LEAD will be conducting a pilot of input loans at a LEAD branch (QR Oct-Dec 2015).

There is evidence of LEAD currently and continuing to work with other organisations involved in agricultural extension work, and to some extent in accessing agricultural markets. While private sector companies (such as PPTL) are likely to sell their products and services into the target market[17]it is less clear to what extent these other organisations (often donor supported) pursue a market development approach.

4.8.2 M4P related lessons

Key finding: *It is not clear from programme documentation whether the programme first determined the cause of market failures before starting programme activities. There is no clear strategy for the sustainability of LEAD's market interventions, given the programme's service provision role. This may have implications for its reach to achieve scale through Adapt and Expand models. There is little evidence of the programme acting in a dynamic and adaptive fashion.*

The LEAD programme has demonstrated some success in improving the yields of poultry and maize farmers, through training in good agricultural and husbandry practices and through promoting uptake of new technologies. In the agriculture sector, the programme fits well within the overall government agricultural developmental framework.

Further, the programme has promoted and has enjoyed some success in facilitating market access for its trained farmers, showing more success in the poultry market than in the maize market. Similarly, it has managed to successfully train and link input suppliers, farmers and traders with a view to strengthening each participant's position within the respective value chains.

LEAD is a market development programme utilising the M4P approach. As such, the programme should pursue routes that result in the spread of impacts to a wider audience through one of the AAER quadrants. With regard to trained farmers, the programme can report adoption of improved practices and techniques (Adopt). However, this has been heavily dependent on the programme's own training and facilitation process. Some farmers reported sharing newly learned and applied skills and knowledge with their neighbours, some of whom have applied this to their own farming operations (Expand). While there is no evidence of widespread application, anecdotal evidence from some dealers suggests they are investing in additional training (Adapt) to their farmers, with the expectation that this will result in the farmers continuing to purchase goods and services.

It is not clear from the programme how they integrate sustainability into planned interventions. While it is possible that the benefiting farmers, traders and input suppliers are likely to continue their business relationships after the close of the project, the extent of potential replication to other communities around the country is not clear. This is a key aspect of an M4P programme– that is, whether other sectors and players will learn from these processes and linkages and apply them to their own situations (Expand).

[17] In some cases, these sales may be subsidised, at least initially.

This limited M4P application maybe owe the rationale underpinning the programme design. It is not clear from the programme documentation if the cause of the market failures (e.g. limited access to information regarding good agricultural and husbandry practice, limited linkages with input providers, limited access to markets) was clearly determined. The programme appears to have adopted a role as provider (provision of information, training, etc.) rather than facilitator. Even in the case of facilitating linkages between input providers and farmers, and between farmers and traders, the programme remains a service provider to the input providers and the traders, muddying the waters regarding its role.

The provision of information to the farmers serves as an illustrative example. It is not clear why the farmers have no access to reliable, comprehensive and ongoing information. This lack of access to information is a market problem that they need to overcome. LEAD chose to provide information to the farmers, and to some extent to equip the traders and input suppliers with this responsibility, but not to try to solve the underlying problem. This has allowed the trained farmers to increase their access to information but has not made it possible to go any way to resolving why this was a problem in the first place. Hence, the programme is likely to affect the farmers it counts as beneficiaries but may have limited impact beyond these numbers.

Similarly, market development programmes should be dynamic and adaptive, responding to market needs. Focus group discussions revealed that potential loan beneficiaries were reluctant to apply for loans for a variety of reasons. In exploring this issue further, it was apparent that the loan facility applies a strict lending methodology successfully put in place in Bangladesh. The success of this model has resulted in no adaptations or alterations to the model applied in Tanzania, affecting the programme's responsiveness and ability to adapt to expressed needs. Responses from interviews with staff members regarding the decision-making process within the organisation, and whether programme data influence these decisions, reinforces the impression that the programme is not responsive or able to consider adaptations to local market-related suggestions.

4.9 Theory of Change

The analysis of and findings related to programme activities above provide insight into the programme's ToC. In Table 5, below, by mapping the programme activity-level evaluation questions to the ToC output levels, we illustrate how the MTE is testing the different theories beyond the causal pathway. The questions allow for an examination of what is happening, the context within which it is unrolling and an unpicking of the assumptions behind the theories on which the programme is developed.

In summary, the programme-level ToC has largely held true. However, it is not clear, given the limited scope of the programme, whether the proposed programme outcomes and impacts will be felt within a wider market system.

Within the outputs of the ToC, three variations are worth noting:

- There is an assumption that increased collective poultry marketing will follow from increased (and improved) linkages between farmers and traders. This has proven largely true. Improved relationships between stakeholders have led to increased sales and increased income and some increased collective marketing. However, poultry farmers also reported selling birds to traders as individual sales, as and when they needed money, and cooperated with others in the group when there was a demand that they could not meet individually. This variation might speak to the market dynamics, which continue to reflect producer push rather than market pull, and has implications for competitive pricing, which might impact negatively on increased incomes. It also suggests more attention might be paid to strengthening the cooperative model, if this is seen as central to the success of the programme.

- A central delivery mechanism for the programme has been the development of cooperative groups for training purposes and for cooperative marketing to traders. In some cases, the focus of these groups has evolved beyond the focus of improved poultry production. It is not clear if these groups that have alternative focal areas, (e.g. running alternative businesses, acting as savings cooperatives) will continue to remain focused on their primary purpose of improving poultry production.
- The ToC demonstrates the anticipated impact of agrifinance venture capital, but does not demonstrate the offering of agrifinance loans to smallholder farmers. Agrifinance is a significant contributor to the BRAC model and operations, and occupies a significant portion of reporting to BRAC Head Office. Even though MFI finance is not part of the programme funding, the ToC should include this activity, showing the inter-linkages between the offering of agrifinance leads and the uptake of new technologies and inputs.

Table 5: Mapping evaluation questions to theory

Evaluation question	Output level	Testing the theory that…	Evaluation finding
To what extent, for whom and how have efforts to increase linkages between producers and traders resulted in increased access to different types of markets? How do any new linkages between farmers and traders work within this context?	Output 1	… increasing linkages between producers and traders will increase access to markets. Examination of process.	This has been more successful in the poultry market than in the maize market. This is partially because increased maize yield is often consumed by the household, whereas poultry is perceived as livestock to be consumed and/or sold. Improved linkages between poultry farmers and traders and the establishment of a trust relationship have resulted in both farmers and traders benefiting economically. While this aspect of the ToC has worked well within the programme there is concern about similar practices being adopted beyond the programme.
Do the ways in which the programme supports linkages between producers and traders represent the most efficient approach to delivery? Do the delivery mechanisms used place the programme in the role of a facilitator or service provider?	Output 1	…the programme delivery approach is efficient. Examination of process.	BRAC has largely performed the role of service provider in implementation. While efficient in its implementation it may achieve greater scale by facilitating market-oriented solutions in line with M4P thinking. There may be an assumption in the programme design that simply illustrating the benefits of these relationships will result in the removal of market obstacles. If this is the case this assumption has proven false. There is a need to identify market obstacles and then facilitate the demonstration of overcoming these.
What evidence is there that the programme is resulting in sustainable change in the relationships between producers and buyers? What factors are making that change happen or what constraints are stopping it from happening?	Output 1	….the programme is facilitating sustainable change in market player relationships. Examination of process.	In the poultry market dealers readily spoke of increased sales from LEAD farmers and of providing them, and their neighbours, with additional inputs and support. The dealers saw a direct correlation between providing adequate advice and inputs with quality produce that they were able to on-sell. This was not that apparent in the maize market. Maize production's reliance on irrigation through rainfall decreases the level of control the farmer has over the production. The ToC largely holds true for the poultry respondents who participated in the programme, and for a small circle beyond these players, but it is not clear that relationships have been sustainably changed (or even impacted) within a wider market.

Evaluation question	Output level	Testing the theory that…	Evaluation finding
What evidence is there of dynamics within farmers groups that will ensure sustainability? What are these? How do they work?	Output 1	…farmer groups can become sustainable and continue post-programme. Examination of process.	Farmer groups have evolved beyond their initial purpose and in many cases have initiated other mutually supportive ventures. It is not clear if the original purpose of the groups (good agricultural and husbandry practices) remain central to the purpose of all the groups. There was anecdotal evidence of some cooperation in selling poultry and this has resulted in higher prices for each bird. It is likely that this practice of collective marketing will continue as long as prices remain higher.
(Social and poverty focus): What evidence is there that the programme is reaching the most marginalised farmers? What elements of the programme are ensuring that the most marginalised farmers are finding new relationships within the market system?	Output 1	…that the programme can reach the most marginalised farmers and help them to create new market relationships.	It is not clear that the programme is reaching the most marginalised. Selection criteria for the groups remain vague. Many focus group respondents were in a position to utilise a parallel business to ensure the repayment of a loan. Those who were not in a position to do so were reluctant to borrow money for inputs, suggesting that the poorer farmers within a group (those without parallel businesses) may not have benefited fully from the intervention.
(Gender) To what extent is the programme demonstrating an understanding of the different factors that influence how men and women interact with markets? What are those factors?	Output 1	…that the programme addresses the different factors that influence how men and women interact with markets.	
To what extent and how have LEAD farmers experienced changes to the use of inputs and new technologies? What impacts have these had? Who is most likely to have experienced the impacts?	Output 2	…farmers experience change in their use of inputs and technologies. Examination of impact areas.	In the poultry sector the impact of the use of technologies, practices and inputs is obvious in the size and market value of the birds among the farmers who have readily adopted new technologies and inputs. Both poultry farmers and traders have been impacted by the adoption of inputs and new technologies.

Evaluation question	Output level	Testing the theory that…	Evaluation finding
To what extent has farmer adoption of improved practices led to increased yields and quality of produce? What evidence is there that adoption of improved practices can be attributed to the LEAD programme?	Output 2	…adoption of learning leads to increased yields. Examination of process.	In the maize sector the increased use of inputs has led to increased yields but this impact is also dependent in independent variables such as rainfall. In a few maize focus groups there was considerable positive response to the use of a hand operated maize sheller, which was seen to be a very good timesaver that improved quality of the processed seed. Cost was a barrier to the use of these, but some groups were planning on group savings to buy one together. Use of PICS bags has been popular and has increased the quality of storage. Anecdotally, the price of the bags was mentioned as a barrier, with smallholder farmers buying individual bags as they could afford them. This might impact on the overall quality of maize if these maize farmers ever opt to sell collectively.
Is there any evidence that increased access to markets is resulting in increased income from maize or poultry? What factors facilitate or constrain the increase?	Output 2	…improved market access increases income. Examination of linkages and process	Poultry focus group respondents reported increased income from birds sold to traders. Traders reported increased income from birds sourced from LEAD trained farmers. Reported factors contributing to these increases prices were healthier, larger birds. There is limited evidence of this within the maize markets, partially because of the drought conditions impacting on maize farmers.
To what extent and how has farmer training improved farmer knowledge and led to adoption of improved practices and technologies?	Output 2	…farmer training leads to improved knowledge and adoption. Examination of process.	Maize and poultry focus group respondents both reported implementing improved practices and adopting technologies and inputs as a direct result of LEAD training. In some cases this increased knowledge was shared with neighbours, demonstrating a more ingrained nature of the knowledge and skills.
How does training for agrovets, agrodealers and traders influence interactions with farmers?	Output 2	…training agrovets and agrodealers leads to improved interaction with farmers. Examination of process.	There is anecdotal evidence of strong businesses relationships being developed between farmers and dealers and input providers.

Evaluation question	Output level	Testing the theory that…	Evaluation finding
What evidence is there of replication of learnt approaches among farmers, agrodealers and agrovets and traders?	Output 2	…the programme is enabling adoption and adaptation of the approach.	Some poultry and maize farmers reported sharing their LEAD training with neighbours, but no evidence was provided. Poultry dealers and traders reported providing additional training and inputs to farmers who asked for the same treatment as LEAD farmers, after seeing an improvement in their livestock.
What evidence is there of potential impacts of the use of agrifinance loans? What are the contextual factors that influence how the loans are used and the impacts felt as a result of that use?	Output 3	…loans will facilitate the adoption of new inputs and technologies. Examination of process.	In the case of smallholder farmers, it is not clear that loans have been essential in changing behaviour. Many respondents expressed wariness of taking loans especially for agricultural purposes. While loans may not have prevented respondents from accessing new technologies, reluctance to take out loans (and of BRAC to alter the repayment terms) may have resulted in the programme bypassing the poorest farmers. Respondents reported using loans for a variety of purposes including agricultural inputs, school uniforms and school fees. However, investment loans to agrodealers and traders have reportedly been used to improve and enlarge business premises and increase stock levels. All of this has facilitated smallholder farmers increased access to new technologies and inputs.
Who is most likely to use the loans system? How are they using it? What are the enablers/constrainers to using the loans?	Output 3	…loans are used by all producer group members who wish to. Examination of process.	
To what extent have proposals to create linkages with private sector partners been successful? What evidence is there of these linkages?	Output 4	…private sector linkages are created.	There is some evidence of private sector linkages, as evidenced by other market players accessing the LEAD network of farmers to sell additional inputs or technologies. BRAC has supported sharing of information between players in workshops and conferences.
Are the gaps identified in the value chain being addressed by the approach to facilitating investment in targeted areas? What evidence is there of outcomes from investments made by the investment funds? What is hindering or helping it to happen?	Output 4	…that the value chain can be strengthened by targeting investment to gaps.	There is little evidence of value chain gaps being addressed sustainably and at scale. Some traders reported being able to access loans to grow their businesses, but there was no indication that these facilities would extend beyond the scope of the programme. Similarly, while stakeholders welcome LEAD sharing of information, there is no indication that this sharing of information between these stakeholders will continue beyond the scope of the programme.
What evidence is there of sustainable outcomes of the facilitation workshops? To what extent is this approach welcomed by stakeholders?	Output 4	…that facilitation workshops produce clear outcomes that are sustainable and useful to stakeholders.	

5 Conclusions and recommendations

5.1 Conclusions

Relevance: The LEAD programme is relevant at a macro level to the objectives of the GoT, the African Union and DFID, and at a micro level to the household beneficiaries. The programme is particularly relevant at a micro level given the market development focus at smallholder level and the wide geographic spread and scale through which it works. The programme is also relevant at a micro level by targeting local smallholder farmers, trader and agrovets, facilitating both information and market linkages, with a view to sustaining these beyond the scope of the programme.

Impact: Producer groups are successfully adopting training, with maize groups reporting an increase in the application of GAP, and poultry groups adopting use of tools for poultry care (e.g. vaccination and medical care practices). The impact of these shifts in practice is particularly strong in relation to poultry sales, which have seen significant increases. The impact on maize production is less evident, with low yields attributed to climatic shocks.

Improved access to markets is particularly strong in relation again to poultry farmers, who are having success with collective marketing. This increased access to poultry markets is resulting in higher income for poultry farmers. There is no significant difference in income among maize farmers, with most increases in production consumed within the household or traded within the community.

Loans are an important mechanism in the pathway to uptake of training. For many, the loans are an important factor in becoming a member of the group, with loans used to purchase inputs. Most farmers need an additional source of income to repay the loans, mainly because of the timing of the loan repayments. Maize farmers in particular will find it difficult to make repayments from any income from maize production, owing to the seasonality of benefit.

Some groups are demonstrating unanticipated impact in terms of the evolution of additional group functions. Examples of this include the self-development of group savings, emergency loan and investment schemes. There is also clear impact in terms of important social support, which sometimes include, v n s financial support between group members.

Effectiveness: The programme has helped create linkages between maize farmers and the private sector, including demonstrations of new products to farmers. The scale of LEAD is of particular interest to many private sector partners, with organisations keen to learn from LEAD's farmers and the programme's experience. The number of agrifinance loans exceeds the original target, with slightly higher percentages for maize farmers compared with poultry farmers. There is evidence that the timing of repayments is stopping some farmers from taking loans, as an additional source of income is required to make early repayments.

Training of agrovets, and agrodealers is leading to more interactions with LEAD farmers, with farmers reporting that this interaction improves their access to quality inputs. Agrovets/agrodealers are also reporting increases in business that is not restricted to LEAD farmers. Links between LEAD trainers and LEAD-trained poultry farmers are particularly evident and beneficial to both farmers and traders in terms of increasing market access and income.

Efficiency: The programme has been acting as both facilitator and service provider, with the latter role as provider of training and information being scaled down now in the last months of the programme. However, many farmer groups are still reliant on information from the programme officers owing to limited access to government agricultural extension services. Facilitation of relationships between farmers and market stakeholders is successful, with stakeholders reporting sustainable relationships working without ongoing LEAD support.

The Investment Fund component is demonstrating significant impacts for grantees in terms of increases in income, assets and business involvement, as well as benefits for producer group farmers.

The multi-layered structure of the LEAD programme is reliant on good communication methods within the team, which enables delivery of work plans. However, this structure does also mean there is limited possibility for those on the ground to adapt rapidly to local context, which may lead to limitations in terms of promotion of market innovation. High staff turnover has been a particular problem for the LEAD programme, due largely to government employment opportunities which are viewed as lucrative and longer-lasting. This has meant the need to consider the potential impacts of this on the programme and in particular the adoption of market systems approaches.

There is evidence that the programme has attempted to address the vertical management structure, which limits adaptation at programme organiser and area coordinator level, but this remains an issue. Staff have more space to discuss and provide inputs ('bottom-up'), but the programme's ability to be responsive (a key characteristic of a market development programme) remains restricted by the structures.

LEAD is inconsistent on reporting against VFM, and does not have clear systems in place to capture these data. It may require improving the type of data that it collects and addressing its staffing model. The programme appears to perform better than other programmes in some areas, while not giving as much value in others.

Sustainability: The sustainability of farmers groups appears to depend in particular on the added value farmers perceive in working as a group. This relates not only to increases in income but also to social cohesion. Additional activities, such as savings schemes or plans to become 'formalized', are also key to ensuring the longevity of these groups post-programme.

In terms of the replication of the programme learning, there is evidence of the wish for learning among neighbouring farmers, and some evidence of LEAD farmers supporting neighbours to adopt the new practice they have learnt themselves. Among agrovets and agrodealers, it is less likely that they will teach others what they have learnt, given the competitive nature of the market and the fact they do not want to lose the competitive advantage gained. There is some evidence that traders are passing on information about the LEAD programme and the producer groups to other traders, but, again, this may be limited by the desire to keep competitive advantage.

Crosscutting issues: Regarding reporting against the logframe, the reporting system is regular and comprehensive. However, the monitoring system has different layers and functions (monitoring, evaluation and research), which makes it difficult for the type of triangulation and synthesis between the datasets that would facilitate programme adaptation. Overall, while there are a couple of examples of LEAD taking action on monitoring findings, the system does not allow this to happen easily. There is limited opportunity for country-based staff to interpret data and suggest responses.

The programme is working with more women than men, conducting some gender analysis. However, it is not clear how this feeds into the programme to ensure the approach meets the needs of women. The programme is clear in defining that it does not work with the most poor, as the programme requires assets on which to build. However, there is a specified aim of reaching 'marginalised' smallholder farmers, and the current group formation process does not appear to have a systematic way in which to do this.

The programme should consider re-examining its ToC on a more regular basis to ensure the assumptions thought to underpin the process at design stage remain valid in the middle of implementation. This will allow the programme to make subtle, smaller changes to its implementation model and process, but continue to keep it focused on achieving its logframe objectives.

Lesson learning: LEAD has engaged, and is continuing to engage, with other programmes to both enhance LEAD as a programme and share own learning. There is clearly interest in the LEAD approach from other similar programmes, with recognition of the value of the large number of poor farmer groups formed by the programme, and the aim of the programme to not just train farmers through these groups but also facilitate market access and stimulate markets around them.

In terms of the use of the M4P approach, the programme can report success in the adoption of improved practices and techniques (Adopt), and some evidence of expansion of approaches through farmers training neighbouring farmers and some trained traders working with other traders and farmers (Expand). There is also some limited evidence of traders and investment fund recipients investing in additional training to their farmers (Adapt). However, the role of LEAD as a provider of services rather than a facilitator of solutions means application of the M4P approach is limited. Similarly, lack of facility within the programme to be flexible and responsive to market needs also limits the applicability of an M4P approach.

As a market development programme, it appears there is no analysis of the underlying causes of the market failures. Resolving these market failures is an essential step in designing market development interventions. Instead, LEAD appears to attempt to play the role of service provider, while facilitating market linkage inputs with a limited number of companies, affecting the potential reach and scope of the programme.

5.2 Recommendations

Recommendations based on the evaluation are presented below. These are presented as priorities, where 1 is the higher priority and 3 a lower priority.

Recommendation	Section	Ranking	Comment
a. We recommend the programme consider developing sustainability scenarios that it can then communicate with its various stakeholders. The timing for this is important, as LEAD is currently planning the final workshops and meetings, which should include recommendations on sustainability.	4.6	1	Sustainability scenarios could showcase success stories of linkages between traders or agrovets and smallholder farmers, and demonstrate the mutually beneficial relationship of these linkages.
b. The programme should continue lesson and information sharing with other, similar, organisations.	4.8.1	2	While BRAC is keen to partner with organisations to carry on its model, there are lessons in its method that would benefit other, non-affiliated organisations that are looking at working in the maize and poultry value chains.
c. Considering that the programme may wish to develop further, we recommend that any future programme start by identifying the reasons for the current market situation and develop strategies to address underlying constraints to the effective functioning of the market and thereby increase the likelihood of programme sustainability.	4.8.2	1	LEAD does not currently address underlying constraints to the pro-poor functioning of markets, which impacts on the programme's scale and sustainability.
d. The currently successful agrifinance model, adopted from the BRAC approach in Bangladesh, would be more acceptable to many if adapted to take into consideration the longer market lead-time of maize farming. The programme should take into account previous agrifinance experience of many potential borrowers.	4.2.4 4.3.3	3	BRAC may want to consider making adjustments to the agrifinance model for local conditions, especially with regard to applicability to maize farmers to allow for them to repay loans post-harvest.
e. The group solidarity dynamic evidenced among many of the producer groups is of significant value in terms of ensuring sustainability of the programme activities, but also in helping replicate among existing communities. In the last months of the programme, additional efforts should be made to help replicate how successful groups are working.	4.2.5 4.6.2	1	This unanticipated effect of the interventions might be leveraged in future iterations of the programme.
f. Groups should be encouraged to share their experiences of training more widely. In the last months of the programme, staff should work with groups to give them confidence to train others.	4.2.1.1 4.2.1.2 4.8.2	2	

Recommendation	Section	Ranking	Comment
g. We recommend more effective use of the programme data to inform decision-making processes, documenting and sharing the process with relevant stakeholders.	4.7.1 4.7.2	2	Currently field staff do not always seem aware of why decisions are made and implemented. More transparent use of data and the decision-making process may go some way to empowering them in their own implementation.
h. If the programme seeks to improve its contribution to the maize market, we recommend the programme consider more harvest cycles in its maize programmes to ensure households can produce sufficient amounts to consume within the household and still have excess to sell into the market.	4.3.2.2 4.2.2.2 4.2.3.2	1	This recommendation to be considered in any future iterations of the programme.
i. LEAD could usefully undertake additional research to explore what increased maize subsistence means to household income in terms of displacement of funds.	4.2.3.2	3	There has reportedly been little selling of maize into the market place but significant increased household consumption. LEAD may want to explore any unintended benefits such as changed spending patterns or improved family health.
j. We recommend collecting further information about the value of facilitation workshops and the market analysis information as part of the final evaluation and during the final stage of workshops in February 2017.	4.4.1 4.6.1	1	The sharing of lessons from LEAD would go some way to allowing other players to replicate or learn from this programme. However, there appears to be no mechanism in place to track this impact.
k. LEAD should develop its economy indicators further and continue to track existing indicators over time. It should also document examples of 'cost-conscious behaviour' (i.e. broader actions it has taken to control costs). The programme should consider dropping the initial VFM indicator 'cost per farmer reporting a 10% increase in income' if data are not available to report on it.	4.4.4	2	
l. LEAD has significant work to do with regard to its effectiveness VFM indicators. The programme should redefine these VFM indicators in line with its available data sources, especially the mid-line survey data. The programme needs to extrapolate total programme impact for these refined indicators from the survey data. The programme needs to conduct further analysis of the data for maize farmers where there are no significant reported results for key household food security and welfare data points.	4.4.4	1	

6 Appendices

Appendix 1: Terms of Reference

Evaluation of DFID's support to the IRAT and LEAD programmes

Terms of Reference

1. Background

This Terms of Reference (ToR) sets out the scope of work, requirements and reporting procedures for the Evaluation Manager (EM) that will carry out the independent evaluation of the Improving Rural Access Tanzania (IRAT) programme and the Livelihood Enhancement through Agricultural Development (LEAD) programme funded by DFID:

- IRAT aims to improve rural roads in Tanzania in order to benefit agricultural development, and to improve access to markets and basic services.
- LEAD aims to raise the incomes of smallholder maize and poultry farmers by improving farmer skills, and making it easier for farmers to access inputs, and promote the expansion of markets for smallholder farmers.

The implementing partners (IPs) are responsible for managing the programme and monitoring progress against indicators in the logframe, while the EM is responsible for undertaking independent evaluations.

2. Purpose and objectives

The purpose of the independent evaluation is to provide an independent evaluation of each project according to the OECD DAC criteria (e.g. relevance, efficiency, effectiveness, sustainability and impact) and in relation to learning and replicability. The EM's evaluation will also consider design issues and provide evidence which can be used to inform and adjust the design and implementation of each project, as well as provide evidence and inform design of future projects/programmes.

3. Scope of work

Overall, the EM will be responsible for the independent evaluation of the IRAT and LEAD programmes. The evaluation implementation phase will consist of mid-term and final evaluations for both programmes, and impact baselines and endlines presented as case studies and a synthesis report for IRAT. Details are set out below.

The evaluations will determine the evaluation questions that are most relevant to the respective programmes. The information generated and assessments made by the EM will be used to inform implementation of each project (lesson learning and adaptive management) at mid-term and any possible scale-up at final as well as lessons for new projects. The EM will draw on existing data where available, advise on new data collection (compatible with existing systems) where appropriate, collect new data when feasible to do so and ensure all data are made available to IPs as far as possible.

The EM will also contribute to any extension design work currently being undertaken by DFID (as requested); this may apply to IRAT.

a) Mid-term evaluation

The EM will develop an evaluation design document for each project including recommended questions, evaluation approach to be used, proposed data collection and analysis methods and communications and uptake plan. The evaluation questions to be answered will be based on the requirements of stakeholders of the evaluation, particularly the IPs, government of Tanzania and funder (DFID). The communication and uptake plan will include the intended

process for engaging with stakeholders throughout the evaluation process and communicating findings to stakeholders at all levels and encouraging action based on recommendations.

Based on this design document, the EM will conduct MTEs for both IRAT and LEAD. The MTEs will:

- Assess the **relevance** of the projects to the needs of the target groups.
- Evaluate the **effectiveness** of each of the output and outcome areas for each project (outputs to outcomes).
- Evaluate the **efficiency** of each project, including, but not limited to, delivery mechanisms, management and **value for money** (inputs to outputs)
- Assess the **gender, social and poverty focus** of each project.
- Evaluate the suitability of **governance** for both projects.
- Assess the suitability and quality of the **M&E frameworks** employed.
- Provide **actionable recommendations** to improve the design and delivery of interventions.
- Ensure appropriate data gathering mechanisms are in place for the **final evaluation**.

The MTE will:

- **Present findings based on the questions included in the evaluation framework.**
- **Provide recommendations and guidance to each project on their M&E frameworks** to encourage each IP to collect data for programme monitoring purposes which provides useful information and evidence to feed into improvements in implementation and for the final evaluation.
- **Review the monitoring data** that is being gathered by each project to provide an independent opinion on whether the evidence is robust, accurate and suitable for evaluation purposes where required.
- Contribute to the final evaluation by suggesting the **key themes** to explore and the **detailed and associated evaluation questions** and making **any necessary recommendations for refinement** of the plans for the final evaluation.
- Produce **communication and learning materials and events** (internal and external audiences) according to the details set out in the communication and uptake plan.

The primary data gathering for the MTE for both IRAT and LEAD will take place end August/September 2016. These suggested timings are based on the need to strike the balance between sufficient elapsed time for IPs to have gained delivery experience and sufficient remaining time for recommendations to be implemented and for those changes to be effective. In the case of LEAD, the MTE is timed to coincide with the IP's own planned MTE to avoid duplication of effort. The intended audience of the MTEs will be DFID and IPs.

b) Final evaluation

The final evaluation will look at all five DAC criteria (**relevance, effectiveness, efficiency, sustainability and impact**). The final evaluation will consider the specific change processes identified in the ToC, assessing the extent to which the inputs/activities have affected the different change processes and assessing the validity of the overall ToC and the value for money of the programme. The evaluation will add insights into where the programme is contributing to higher level impacts (outcomes and impact). In addition, the **associated learning and replicability** of the

changes achieved need to be considered and recommendations made for an appropriate exit strategy or extension of each project.

The final evaluation will take place in [Q4 **2018** – date TBC] for IRAT and [Q4 **2017** – date TBC] for LEAD, delivering outputs as listed in Section 6. These will aim to provide useful recommendations to guide the exit/handover strategy or transition to any extension as well as learning in relation to the particular programme theme (rural road investment for IRAT and markets for the poor for LEAD).

The intended audience of the final evaluation will be discussed within the **communication and uptake plan** and might include IPs (non-government and government); policy formulators; DFID and other donors; development practitioners and programme designers; private sector stakeholders. Reaching these audiences, particularly policy formulators, will require that the EM builds and maintains strong relationships with stakeholders throughout the evaluation process and presents information in an accessible way. At the end of the final evaluation, **communication and learning materials and events** (internal and external audiences), according to the details set out in the communication and uptake plan, will be produced.

4. Specific information for IRAT and LEAD

IRAT mid-term and final evaluations, baseline and endline, and ongoing work:

- **Ongoing:** Engaging PORALG, Cardno and DFID throughout the evaluation process; implementing the communication and uptake plan (providing periodic updates to DFID).
- **Baseline:** Baseline case studies (qualitative and quantitative), including case study synthesis.
- **Endline:** Endline survey case studies (qualitative and quantitative), including case study synthesis.
- **MTE:** The evaluation will explore the evaluation questions which will be included within the MTE design document. In order to link impact assessment findings with the mid-term and final evaluation exercises, the programme evaluation will include institutional issues such as the road selection/prioritisation process, DROMAS2, technical assistance, etc. It will explore the prioritisation process including comparing the different factors included in the prioritisation score – to see which factors are linked to greatest benefit and impact. It will draw on findings from the baseline case studies and synthesis.
- **FE:** In addition to exploring the evaluation questions which will be included within the final evaluation design document, the programme evaluation will draw on findings from the endline case studies and synthesis.

LEAD mid-term and final evaluations, and ongoing work:

- **Ongoing:** Engaging BRAC and DFID throughout the evaluation process; implementing the communication and uptake plan (providing periodic updates to DFID).
- **MTE:** The EM will undertake the MTE alongside and in collaboration with BRAC's own MTE.
- **FE:** The timing of the final evaluation will coincide with BRAC's own data collection.

NB. The approach is to undertake the evaluative work collaboratively with BRAC, but maintaining the independence of the EM.

5. Skills and qualifications / team

The EM will field a team of experts that combine expertise in:

- M&E of complex, multi-component development projects using quantitative and qualitative data collection methods.

- M&E of agriculture, rural development, market development and infrastructure projects and programmes.
- Sectoral expertise appropriate to each programme.
- Using evaluations as a tool for lesson-learning, shortening feedback loops, etc.
- Evaluations in the East African region.
- Demonstrated understanding of political economy issues in the region and areas of interest.
- Generating data to demonstrate differentiated impacts (i.e. rural vs. urban, women vs. men).
- Experience of DFID M&E frameworks and systems.
- Building strong relationships with stakeholders and increasing evidence uptake.

6. Outputs

MTE:

- IRAT MTE report; a workshop with PORALG, DFID, Cardno and other stakeholders explaining the recommendations and agreeing how they can be implemented; recommendations on scope and questions for the final evaluation (Q4 2016).
- LEAD MTE report; a workshop with LEAD/BRAC, DFID and other stakeholders explaining the recommendations and agreeing how they can be implemented; recommendations on scope and questions for the final evaluation (Q4 2016).
- Accessible material to share with and inform policy formulators (this may include presentation workshops where appropriate) (Q1 2017).

Final evaluation:

- IRAT FE report within 6 months of project close; a workshop with PORALG, DFID, Cardno and other stakeholders explaining the findings, conclusions and recommendations (Q4 2018 – date TBC).
- LEAD FE report within 6 months of project close; a workshop with LEAD/BRAC, DFID and other stakeholders explaining the findings, conclusions and recommendations (Q4 2017 – date TBC).
- Accessible material to share with and inform policy formulators (this may include presentation workshops where appropriate), delivered within six months of the projects closing. (LEAD Q1 2018; IRAT Q1 2019).

Quality characteristics of delivery of outputs: The evaluation team will ensure that the evaluative work is focused on adding value to stakeholders and promoting uptake of evidence, as well as being of a high technical quality. Therefore the evaluation team will ensure that all evaluative work and the resulting outputs pay particular intention to quality of implementation process as well as the extent to which these outputs are useful, accessible and offer appropriate analysis. Timeliness, clarity of communications and quality of stakeholder relationships are core to this. DFID will use these quality characteristics, including the KPIs detailed in the contract, in judging delivery of outputs, as well as following DFID technical quality assurance process.

IRAT deliverables and timing

#	Deliverable	Including:	Mid-Term	Final
1	Evaluation Design Report including communication and uptake plan	• Evaluation Frameworks • Data Collection Tools • Communication and Uptake	Q2 2016 (June)	Q2 2018 (June)

#	Deliverable	Including:	Mid-Term	Final
		Plan		
2	Survey Report			Q3 2018 (Aug)
3	Case Study Reports		Q2 2016 (June)	Q3 2018 (Sep)
4	Synthesis Report		Q3 2016 (July)	Q4 2018 (Oct)
5	Mid-term Evaluation Report	• Programme evaluation	Q4 2016 (Dec)	
6	Communication and Learning Materials	• Communication materials and events (internal and external audiences)	Q1 2017 (Jan)	Q1 2019(Jan)
7	Final Evaluation Report	• Programme evaluation		Q4 2018 (Dec)

LEAD deliverables and timing

#	Deliverable	Including:	Mid-Term	Final
1	Evaluation Design Report including Communication and Uptake Plan	• Evaluation Frameworks • Data Collection Tools Report • Communication and Uptake Plan	Q2 2016 (June)	Q3 2017 (Sep)
2	Mid-term Evaluation Report	• Programme evaluation	Q4 2016 (Dec)	
3	Communication and Learning Materials	• Communication materials and events (internal and external audiences)	Q1 2017 (Jan)	Q1 2018 (Jan)
4	Final Evaluation Report	• Programme evaluation		Q4 2017 (Dec)

7. Governance arrangements

Governance structure	Members	Responsibilities
Implementing partners	PORALG BRAC/LEAD	Implementing the programme, collecting and reporting results against the logframe.
Evaluation Manager	Evaluation Manager	Ongoing engagement with IPs; undertake independent evaluation (MTE and FE); IRAT baseline and endline surveys.
Management Group	DFID	Procure EM; approve design of methodology; approve budget and approve timeline.
Engagement Group	DFID, BRAC/LEAD, PORALG	Review design and methodology (including evaluation questions); review and approve any surveys designed; review MTE and FE reports.

8. Reporting

The EM will report to DFID Tanzania's Infrastructure and Trade Adviser for the overall contract, also working closely with the same DFID Adviser for the IRAT programme and the DFID Private Sector Development Adviser for the LEAD programme. Meetings will be held as required by agreement between DFID and the EM.

9. Budget

The total available budget for the two evaluations is 667,396GBP.

LEAD and IRAT Budgets	GBP
LEAD	139,702
IRAT	527,694
Total	**667,396**

Appendix 2: Evaluation matrix

DAC criteria		Evaluation questions	Indicators	Data sources
Relevance What is the evidence that LEAD is needed?	1.1	Is the LEAD programme relevant to target households? How do we know this? Who is most likely to benefit from the LEAD programme – how and why? Specifically, how (if at all) does the programme ensure that women and girls benefit?	- Disaggregation of beneficiaries. - Perception of benefits disaggregated by gender and type of farmer.	Focus groups MTE survey
	1.2	How does the programme fit within the wider framework of policies and other programmes which have similar aims?	- Correlation and gaps between programme and wider policy/programme framework.	Document review
Impact What is the evidence that LEAD is changing lives and livelihoods?	2.1	To what extent and how have LEAD farmers experienced changes to the use of inputs and new technologies? What impacts have these had? Who is most likely to have experienced the impacts?	- % of LEAD farmers reporting increased use of inputs and new technologies. - Perceptions of impact. - Disaggregation of impacts by gender and type of farmer.	LEAD outcome data MTE survey LEAD output data Focus groups
	2.2	To what extent has farmer adoption of improved practices led to increased yields and quality of produce? What evidence is there that adoption of improved practices can be attributed to the LEAD programme?	- % of farmers reporting increased yields and production. - Proportion of farmers who identify LEAD programme as a key factor in improved practices.	LEAD outcome data MTE survey Focus groups
	2.3	Is there any evidence that increased access to markets is resulting in increased income from maize or poultry? What factors facilitate or constrain the increase?	- % increase in net income from maize or poultry. - % of producer group members who report increased access to markets. - % of producer group members who cite improved access to markets as a factor in increasing income. - Factors that influence the increase.	LEAD outcome data MTE survey Focus groups
	2.4	What evidence is there of potential impacts of the use of agrifinance loans? What are the contextual factors that influence how the loans are used and the impacts felt as a result of that use?	- % of loan holders reporting impact of the loan. - Perceptions of impacts of loans and factors influencing those impacts.	MTE survey LEAD output data Focus groups

DAC criteria		Evaluation questions	Indicators	Data sources
Effectiveness Outputs to outcomes	3.1	To what extent, for whom and how have efforts to increase linkages between producers and traders resulted in increased access to different types of markets? How do any new linkages between farmers and traders work within this context?	- % of producers reporting increased access to new market areas. Disaggregated by gender and type of farmer. - % of traders reporting new producer linkages. Disaggregated by gender, location, type of trader. - Perceptions of interactions.	Focus groups. MTE survey Key informant interviews
	3.2	To what extent have proposals to create linkages with private sector partners been successful? What evidence is there of these linkages?	Number of linkages with private sector partners, and evidence of the linkages.	Document review Key informant interviews
	3.3	To what extent and how has farmer training improved farmer knowledge and led to adoption of improved practices and technologies?	- % of farmers trained reporting improved farmer knowledge. - % of farmers trained reporting adoption of improved practices and technologies.	MTE surveys LEAD outcome data Focus groups
	3.4	Who is most likely to use the loans system? How are they using it? What are the enablers/constrainers to using the loans?	- Number of people using the loans system. Disaggregated according to gender, farmer type. - Reports of use, constraints and facilitators to use.	Survey Focus groups LEAD output data
	3.5	How does training for agrovets, agrodealers and traders influence interactions with farmers?	- Number of agrovets, agrodealers and traders trained. % reporting increased interaction with farmers. - % of farmers reporting increased access with agrovets, agrodealers and traders. - Perceptions of change in interaction from both farmers and agrodealers/vets and traders.	LEAD outcome data MTE survey Focus group
Efficiency How well does LEAD maximise performance?	4.1	Do the ways in which the programme supports linkages between producers and traders represent the most efficient approach to delivery? Do the delivery mechanisms used place the programme in the role of a facilitator or service provider?	- % of producers reporting that increased linkages with traders are resulting in increased income. - % of traders reporting increased linkages as a result of the	MTE survey Document review Key informant interviews

DAC criteria		Evaluation questions	Indicators	Data sources
			activities of the LEAD programme. - Delivery mechanisms which ensure facilitation vs. those which result in provision of service.	
	4.2	Are the gaps identified in the value chain being addressed by the approach to facilitating investment in targeted areas? What evidence is there of outcomes from investments made by the investment funds? What is hindering or helping it to happen?	- Number of investment fund grantees. - Proportion of those grantees reporting outcomes. - Perceptions of the process. - Mapping of value chain gaps to investments made.	LEAD outcome data Key informant interviews Document review
	4.3	How has the organisational structure supported or hindered the efficient delivery of the programme? How do the different layers of the organisation communicate with each other? What are the outcomes of this communication? Where are the bottlenecks? What are the facilitators?	- Mapping of organisational structure to delivery mechanisms. - % of staff members who cite organisational structure as supporting the delivery of the programme. - % reporting organisational structure as bottleneck to delivery. - Perceptions of efficiency of delivery and links with organisational structure. - Evidence of bottlenecks and facilitators to communication.	Document review Key informant interviews
	4.4	Does LEAD have effective systems and criteria to ensure VFM in planning, delivery and project management? - how could these be improved (if at all)? - what evidence is there that VFM in terms of delivery is being maximised?	- Existence of systems to map VFM. - Evidence of use of staffing and extension costs in programme management. - Evidence of understanding of key cost areas amongst management staff.	Document review Key informant interviews
Governance	5.1	How has programme learning and adaptation been facilitated or constrained by programme and governance arrangements? How has the wider organisational (BRAC) governance system impacted on programme adaptation?	- Links between decisions made at governance meeting and adaptations to programme. - Links between BRAC	Document review Key informant interviews

DAC criteria		Evaluation questions	Indicators	Data sources
			governance and programme decision-making.	
Sustainability	6.1	What evidence is there that the programme is resulting in sustainable change in the relationships between producers and buyers? What factors are making that change happen or what constraints are stopping it from happening?	- Number of producers reporting new and ongoing relationships with buyers. - Number of buyers reporting new and ongoing relationships with producers. - Perceptions of barriers and facilitators to those interactions.	MTE survey Focus groups
	6.2	What evidence is there of replication of learnt approaches amongst farmers, agrodealers and agro-vets and traders?	- Reports of non-LEAD farmers, agrodealers, agro-vets and traders within same markets as trained - LEAD stakeholders demonstrating adoption.	Key informant interviews
	6.3	What evidence is there of sustainable outcomes of the facilitation workshops? To what extent is this approach welcomed by stakeholders?	- Proportion of workshop attendees reporting ongoing new market activity initiated by of the workshop. - Perceptions of the workshops including process and reports of outcomes.	Key informant interviews LEAD outcome data LEAD output data Document review
	6.4	What evidence is there of dynamics within farmers groups that will ensure sustainability? What are these? How do they work?	- Proportion of farmer's groups with plans to continue meeting and interacting post March 2017. - Proportion of farmer's groups with activities not initiated or organised by the LEAD organiser. - Proportion of farmer's groups with their own links to other organisations that will help ensure sustainability. - Perceptions of what is needed to ensure sustainability.	Focus groups
Cross-cutting issues	7.1	(Monitoring) Is the monitoring system enabling staff to be suitably reactive?	- Evidence of adaptations made as a result of the monitoring system.	Document review Key informant interviews

DAC criteria		Evaluation questions	Indicators	Data sources
	7.2	(Monitoring) Are M&E systems working and robust – are they likely to provide appropriate information for the final evaluation?	- Degree to which M&E systems are operational and generating evidence for decision making - Agreement between LEAD monitoring system data generation and the data needs for the final evaluation.	Document review Key informant interviews
	7.3	(Social and poverty focus): What evidence is there that the programme is reaching the most marginalised farmers? What elements of the programme are ensuring that the most marginalised farmers are finding new relationships within the market system?	- Proportion of marginalised LEAD farmers categorised as marginalised. - Proportion of LEAD farmer group membership selected according to criteria to ensure inclusion of most marginalised. - Relationship between programme elements and targeting.	MTE survey Document review
	7.4	(Gender) To what extent is the programme demonstrating an understanding of the different factors that influence how men and women interact with markets? What are those factors?	- Evidence of gender analysis feeding into programme design and adaptation. - Staff perceptions of factors that influence the differences in how men and women interact with markets.	Document review Key informant interviews
Lesson learning	8.1	(Synergies with other interventions) Has LEAD interacted with other similar programmes in Tanzania, or learnt from other programmes elsewhere, and if so how has this improved programme delivery or results? Are other programmes learning from LEAD? What examples are there?	- Evidence of interaction with other programmes and of learning feeding into the programme. - Evidence of other programmes learning from LEAD.	Document review Key informant interviews

Appendix 3:Data collection tools

Key Informant interviews – revised 16th October

Key Informant interviews – Agrovets and agrodealers

1. What BRAC training did you attend?
2. What did you learn from the training? What was the most useful thing you learnt?
3. What impact has it had on how you run your business? (E.g. doing paperwork differently, using different suppliers, interacting with customers differently)
4. What impact has it had on your number of customers? They will probably say that it has increased the number of customers, so then you ask….: Are many of these new customers BRAC farmers? How did you meet them? Are there other new customers apart from BRAC farmers? What do you think is making them now come to your shop?
5. Is there any difference in what the BRAC farmers ask for?
6. Have you been to a Value Chain Facilitation workshop? If so, what was it like? Who did you meet? What value did you get out of it?
7. Are you still using the same suppliers as you were before your training (or workshop attendance)? If not, what changes have you made and why?
8. Do other agrovets/agrodealers know about the training you received? If so, what do they think about it?

Key Informant interview: Investment fund recipients

1. What was the purpose of your grant?
2. Can you give some examples of outcomes of your use of the grant?
3. Have you received BRAC training or been to any Value Chain Facilitation workshops?
4. What is your interaction with BRAC farmers? What is your interaction with other producers? How has this developed?
5. How have you linked to other market actors?
6. Were there any barriers to you being able to use the grant in the way in which you wanted?
7. What helped you use the grant in the way you wanted?
8. What are your future plans and how do you hope to achieve them?

Key informant interview: LEAD-trained Trader

1. What training did you receive from BRAC? What was the most useful thing about this training?
2. What have you done differently following the training? How do you now source the products you sell?
3. Has it changed how you work with producers? If so, in what way? Who do you interact with more now?
4. Is there a difference between the produce received from LEAD/BRAC farmers and other farmers? If so, what is that difference?

5. Was there anything you wanted to change but you haven't been able to? If so, why is that?
6. Has it changed how you work with other market actors?
7. Did you attend a Value Chain Facilitation Workshop? If so, what did you get from that?
8. What impacts has this had on your business?
9. Do you provide advice to producers? Has there been a change in the quality and quantity of produce you receive?
10. Do other traders know about your training? What do they think? Has there been any copying of what you do or people asking how you did it?

Key Informant interview: Non-LEAD trader.

1. How do you source the products you sell? How well does that work for you?
2. How do you access buyers for your products? What would you like to do differently?
3. Do you know about BRAC and how it works with farmers and traders? If so, what do you know about it? (probing here in particular if they know other traders who have received the training, or have come across any LEAD farmer groups – what do they think of them and their produce?)
4. What would help you to improve your business?

Key Informant interview: Non-LEAD farmers.

1. What are the main challenges you face in your farming?
2. How do you sell your produce? Are you happy with this way of selling? If not, have you thought of other ways you would like to sell your produce?
3. Where do you get information and support from? For example, if you have a crop or livestock disease or something that you don't know how to solve – who would you ask? Would that help be easy to get?
4. What do you know about the work of LEAD? What do you think of it?
5. Have you been involved in any of it in anyway?
6. Do you know people who have been? If so, are you aware of what they have learnt or changes they have made as a result of their involvement with LEAD? If so, what do you think of these changes?
7. Have you wanted to change any of your practices based on what you have seen? Have you made these changes? If so, what has been the impact? What challenges did you face in making these changes? If not, what has stopped you from making the changes?

Key Informant Interviews-Programme Officers (LEAD staff)

1. Do you feel that you have a good and strong link to your farmer groups? If so, what makes it good and strong? What keeps it going? What would stop it from working so well? If not, what is the problem with the relationship? What makes it weak? What would help to make it work better?
2. What do you think is the most important part of your job? What helps you to make this work well? What would help you make it work better than it already does?
3. What do you think is the most important element of the programme? Does that currently work well? If yes, what helps it to work well? If not, what do you think could help it work better?

4. What are the main elements of the organizational structure that allow you to do your work efficiently?
5. Who do you work most closely with? How do you communicate with them? What works well with this communication?
6. What do you do with the information you collect from the groups on a monthly basis? Do you use this information yourself or is it passed on for others to use?
7. If there is a problem in one of your groups, and you don't know how to solve it, how do you find an answer to that problem?

Key Informant interview: Regional Manager, agri-finance.

1. What is the role of agri-finance in LEAD? How many of the groups are receiving loans (estimate)?
2. How does the communication work between LEAD and the agri-finance team?
3. Does information about the farmers' needs and problems feed back to the agri-finance team? How are these managed?
4. Looking forward, if the LEAD programme is not in place, will the LEAD farmer groups still be eligible for loans? If so, how will that be managed? Who will liaise with the farmer groups?
5. Have you experienced spread of demand for loans as a result of the LEAD programme? If so, how have you met this demand?

Key Informant Interview – Agricultural Extension Officer

1. What do you know about the work of LEAD? Have you been involved in any way?
2. Have you been to a Value Chain Facilitation Workshop? If so, what did you think about it? What value did you get out of attending?
3. What is your view on the LEAD farmer's groups? How are they doing?
4. Have you seen any signs of the approach being copied by other farmers? If so, how is it being spread and how successful is it?
5. Have you considered using similar techniques and approaches yourself? Would this be possible? If not, why not? If so, what success have you had?
6. What do you think the main things are to be learnt from the LEAD programme?

Focus group guide re-worked 15th October

Note: Most groups don't know about LEAD and refer to the support as BRAC.

First ask the questions about being in a group.

1. How did you all end up being in this group? Who organised it?
   Prompts: who heard about it first? Was it a programme officer who came first?
2. (If someone says that they were asked to get a group together, ask them this) How did you decide who should be in the group? (Prompts: are they friends or neighbours?)
3. Were there other people who wanted to be in the groups but who aren't? Why aren't they? Are they interested now?
4. What did you all want to get out of the group – what benefits did you think you would get?

Then training questions

1. What did you learn from the training?
2. What did you put into practice from the training?
3. Was there anything from the training that you found you couldn't put into practice? (this is often a difficult question for people to understand, but it works if you keep asking it in different ways). Why is it that you couldn't put it into practice?
4. What was the thing you learnt from training that you think had the biggest impact?

Then impact questions:

1. What has been the biggest impact of the training in terms of production? If they talk of increased production, ask if they have all seen an increase in production.
2. What has been the impact in terms of quality of produce?
3. Did you used to sell maize/poultry? If not, are you now able to sell maize/poultry?
4. What has this sale of maize/poultry meant in terms of income? Have they all increased income? Even though they have to spend more on inputs, have they made a profit?
5. What impact has the increased income had on their lives? What have they been able to do with the money? (We want to know here about big changes – i.e. Income, being able to pay children's school fees, improved nutrition etc.). Ask people tell their stories, give examples.

The adoption questions:

1. What do your neighbours think about the changes you have made? (It is likely they will say that the neighbours also want to do the same thing).
2. What do you tell them about how you made these changes? Have you helped/trained any of them? If not, why not?

Then marketing questions:

1. How do you sell your maize/poultry? (for example through trader, individually at the market) Do you sell together or individually? Why do you sell individually? Why do you sell together?
2. If they talk of storing – how are you storing your maize?
3. If they talk of a trader – how did they meet the trader? Are there other traders who also come to their area? Did they used to come before? Do they know about the group and their produce?
4. How are they sure they are getting a good price? What helps them to decide when to sell?

Then input/support questions:

1. Other than the training and your hard work, what else did you need to supply/do/ provide in order to make this impact happen? Did you have support from any other organisations?
2. Poultry – do you use a particular hatchery? If so, how did you make contact with this hatchery?
3. Poultry – what agrovet do you use? Why did you decide to use that agrovet in particular? What is good about them?
4. Maize – where do you get your inputs from? Which agrodealer? How did you decide to use that agrodealer? What is good about them?
5. If you have a problem – such as poultry disease, crop failure etc. – where do you go to get information or help? Where would you have gone before BRAC came along? If they mention programme officer, ask them: Where would you go for help if the programme officer wasn't here? Probe this question to ask about agricultural extension – do they get support from them? Are they easy to access?

Other benefits and loan questions:

1. What benefits do you get from being in a group, apart from the training? It is very likely that they will mention loans, and when they do, ask…
2. Have some of you received loans from BRAC? How many? What did you use the loan for?
3. For those of you who didn't receive a loan from BRAC, did you receive a loan from somewhere else?
4. For those who had no loan at all, was it difficult to find the capital to buy the required inputs? (here, we want to find out what they did to find the capital without the loan.. i.e. Sell other crops, use the training to grow the chicks they had so that they could then invest etc. etc.)
5. The other question we want to ask is why people didn't take a loan. This is a difficult question though, as some feel they are being accused as being wrong for not taking a loan. All of these questions are very personal. If you can find a way of asking that question gently, do so.

Last question:

6. Do they think they'll still be together in a year's time? Why? What helps them to work together?

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Appendix 5:Household survey report

Midline Report for the

Livelihood Enhancement through Agricultural Development (LEAD) Project

Boosting Productivity among rural smallholder Maize and Poultry farmers in Tanzania

November 2016

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Executive Summary

Agriculture in Tanzania dominates as a source of livelihoods with a majority of households participating in it. In addition to serving as a source of income, it also helps ensure that food security is maintained during times of hardship and shortage. Small holder farmers however face a number of constraints during agricultural production. The sector is marred by problems involving a lack of transportation and storage infrastructure, dependence on rain fed agriculture, poor access to information and imperfect markets among others. In addition, the farmers themselves are unable to produce optimally because of the lack of land or capital to invest in agriculture, as well as the high costs of inputs leading to low rates of adoption of agricultural technology.

The Livelihood Enhancement through Agricultural Development project was designed with the objective of addressing these problems. The projects interventions aimed at training and providing farmers with practical skills while linking them to markets and encouraging increased enterprise through a network of input dealers, agricultural commodity traders and agro industries.

The interventions increased the uptake of better crop and poultry management techniques among maize and poultry farmers. It also increased the use of agricultural inputs and mitigated the impacts associated with erratic weather while increasing production among intervention farmers. The project demonstrated the ability to influence agricultural practice among small holder farmers with moderate short term impacts.

Introduction

The Livelihood Enhancement for Agriculture Development project, also known by the acronym LEAD has been undertaking interventions for 4 years since its inception. The project's objective focus is to address the technical as well as the structural barriers to agricultural development in Tanzania's agricultural sector. Tanzania, which is a predominantly agricultural nation relies heavily on agriculture for both household and national economic survival. Agriculture employs about 67% of the population (The World Bank,2014) whilst agro industry accounts for a large section of formal and informal employment in the manufacturing sector(National Bureau of Statistics,2015). The presence of many small scale farmers, all involved in crop production also contributes greatly to the national food security with an estimated 80% of food consumed in SSA produced by small holder farmers. These farmers however face innumerable challenges during production in a sector that is considered to be one of the most unpredictable and risky.

The successful practice of small scale farming is subject to several constraints that affects progressive participation by farmers in the sector. These can be broadly categorized as demand and supply side constraints. The supply side generally refers to the sectors and systems that are exclusive of the farmers own efforts but which, irrespective, affect the farming enterprise as a whole. These include mainly the input and output markets which should generally feed into the agro system. These markets are mostly shallow with few participants and affected by externalities such as national policy frameworks, infrastructure, and imperfect market conditions characterized by little access to information. These factors are usually out of the sphere of control of the farmers and therefore they are forced to practice farming amidst these conditions. The demand side constraints are similarly significant in magnitude and these mostly refer to farmer specific conditions. Probably the most significant ones include limited land holdings which is a limiting factor in production, and capital. Most farmers farm on small pieces of land ranging from between a few square meters to about 3 acres. Contributing to the problem is the fact that many farmers lack sufficient knowledge and skills to be able to practice profitable agriculture and are therefore adopting new, more productive techniques at a very slow pace. This has meant that they are producing at less than optimum levels but unlike the demand side constraints, these are to a large extent within the control of the farmers. In addition, the sector is increasingly affected

by the changing global climate which has the potential to affect agricultural productivity adversely.

The LEAD project presents a multifaceted approach to addressing these problems through the use of the Making markets work for the Poor (M4P) model with interventions in both the demand and supply sides. It will also integrate a bottom up approach to encourage participation of local members of the community in the delivery of services and provision of extension services, which is BRAC's preferred model. It therefore has implications on the sustainability of the project in the medium to long term. These interventions are aimed at bridging the gap between the input/ output markets and the farmers, as well as increasing the farmer's capacity by providing them with training in best agronomic practices and learning by demonstration with the target of increasing household agricultural productivity and incomes.

The Project Conceptual Framework and Theory of Change

The M4P model makes use of integrated interventions that are meant to narrow the gap between farmers and the input/ product markets. This is in order to ensure that all barriers to agriculture are addressed considering the amalgamated nature of problems faced in the agricultural sector. The LEAD program adopted this model, combining it with its own grassroots approach with major interventions among farmers, extension service workers, inputs and produce dealers as well as agro industries. This hybridized model hypothesizes that by supporting farmers to improve their agronomic practices and increasing their skills and knowledge, they can increase their household agricultural productivity, incomes and general welfare. Similarly, by developing the non-farm production sectors, it will encourage a more competitive and robust market for both inputs and outputs. At the same time, it will help link the different actors to each other in a manner that will develop the whole agricultural value chain.

The scope of the evaluation however focuses majorly on the on farm interventions that are linked to the other supply side interventions like credit and access to markets. The next sub-section details specifically the projects assumptions, activities, expected outcomes and intended impacts with emphasis on the interventions targeting farmers.

Summary of Project Interventions among Maize and Poultry Farmers

The main project interventions for the farmers are threefold. To provide them with training and refreshers to enable them learn and apply new skills in practice. The farmers will be organized in their communities to form farmers groups in which they can collectively participate in training and refresher activities. The farmers groups are also intended to help increase the farmer's competitiveness, made possible by taking advantage of economies of scale through collective marketing of their produce. Through these farmers groups, they will also be able to access credit through the LEAD projects agro development fund. In addition to these major activities, the lead farmers will also be encouraged to take up different technologies and improve on practices through the use of demonstration farms.

Through the training and demonstration farms, it is expected that this will impart important skills that they will be able to apply in order to increase their productivity. These include agronomic practices to increase moisture conservation, and better crop and poultry management techniques. It is also anticipated that it will increase the take up and use of improved inputs that have the potential to increase their yields. Access to credit according to the project assumptions is also a big limitation in agriculture with loan penetration and access through formal institutions being very low. The project through its lending facility will avail loans to farmers to enable them invest in poultry and agriculture. This, according to the project theory of change should help to kick start large fixed investments or to smooth out seasonal variable costs of production.

In addition to these interventions, the project will also link the maize and poultry farmers to markets, both local and non-local. Market access presents a big problem especially in rural

agriculture as a result of the limited transport infrastructure, lacking preservation and storage facilities and the presence of middlemen that offer low farm gate prices among others. The challenges relating to markets are therefore not defined by the lack of markets but rather the numerous factors that limit the farmer's ability to take advantage of the available opportunities. By providing training and linkages to produce dealers, agro processors and other higher value chain participants, this is expected to reduce the transaction costs for both the farmers and the dealers as well as to help promote efficiency among all the market actors. It will ultimately reduce the time and resources spent searching for buyers or sellers. For the farmer, this implies less costs spent on preservation, storage or transportation.

The interventions in both the maize and poultry sectors will be largely similar.

The Network of Change Agents

The main agents of delivery of the services are summarized below;

1. Lead farmer - Is a model farmer that is responsible for the management of the farmers group as well as training other farmers under him. They are provided with training in agronomic best practices and are to train other farmers in his/ her community as well.
2. General farmer- These are farmers with either the maize or poultry programs that under the stewardship of the lead farmer form a farmers group. These groups are where they are provided with training and skills in agronomy and they also act as change agents within the communities.
3. Demonstration farmer- They are trained maize or poultry farmers that are provided with resources to utilize in their farms, meant to act as beacons within their communities to anyone who is interested in learning to improve their own farms. The demo farmer can also provide technical advice to other farmers.

Research Design and Methodology

Overview of the Study Design

The evaluation design was done putting in consideration the project design with the intention of measuring the impacts of the project, specifically on the farmers. An evaluation was therefore designed to measure how the program interventions impact the farmer's productivity, livelihoods and incomes. Based on the activities of the project, a Randomized Control Trial (RCT) was used to estimate the program impacts on the intervention farmers for comparison against a counterfactual or farmers that do not participate in the program. Through the random allocation of farmers to either a treatment or a control group, we are able to ensure that the two groups are balanced on observable characteristics and therefore assume balance on unobservable characteristics as well. If we observe any changes in the treatment group over the control, then this change should be attributable to the actual project interventions and would suggest causality. We can therefore be confident in any claims regarding the projects social and economic importance.

Evaluation Questions

To be able to attribute any observed impacts on the beneficiaries to the project, we developed a set of evaluation questions that the study was interested in answering, which are outlined below;

Evaluation Question 1: Whether the program actually helped to increase adoption and productivity and if this translated into economic benefits for farmers participating in the program?

Evaluation Question 2: Whether producer groups are sustainable and how beneficial they are to the farmers?

Evaluation Question 3:How effective agricultural financing was in promoting the use of improved agronomic practices?

These were the main guiding questions for the study when developing the evaluation framework as well as the RCT design. The evaluation design was intended therefore, to be able to make inferences about the project activities and outcomes. To achieve this, three arms were included in the design. These were categorized into two treatment arms and one control arm. The first arm, a standard treatment arm is intended to measure the impact of the integrated package of interventions while the second treatment arm was incorporated to measure the additional impact of credit in addition to the standard program. Farmers in this group in addition to getting the programs standard interventions, would also get access to credit. The control group was a pure control that received neither the standard program nor credit. Allocation to treatment was done randomly with the unit of randomization being the individual nested within the communities/ farmers group. Owing to the fact that the interventions were to be administered in farmers groups made up of 10-15 farmers, in the evaluation of the impact of the credit arm, this was to be used for clustering. Farmers were allocated to either a treatment or a control group before being allocated to clusters generated based on proximity to each other. The actual feasibility of maintaining the clusters was however subject to the ability to organize the farmers groups according to the designated clusters. The main unit of randomization therefore was maintained as the individual farmer. The challenges with the person randomized control trial design, vis a vis the nature of the interventions is that there is a possibility of having spillover effects occurring in our control group.

Study Sites & Sampling Framework

The midline survey was performed in the same 10 branches in which the baseline survey was done. These branches were selected from a sampling frame that consisted of 40 branches in which the LEAD project operates. The branches were categorized into the 5 agro ecological zones from the Northern Zone (Arusha, Kilimanjaro, Manyara), Southern highlands (Mbeya), Central Zone (Dodoma), Lake Zone (Mwanza) and Eastern Zone (Dar essalam, Morogoro). The final study branches were then selected from each zone. This was done in order to ensure that the sample was representative of the population in the areas where the project operates as well as to capture any inter geographical variations. Branches were selected randomly so each had an equal chance of selection.

Our sample size requirements were calculated a priori to observe for sensitivity in mean differences between two independent groups assuming a two tailed test and 80% power. The final number of study farmers were oversampled to compensate for attrition. At branch level, the sample was stratified by whether the farmer was a poultry or maize farmer, then by gender.

Attrition and selection bias

Considering that the baseline survey took place in the last quarter of 2014, there was a two year lapse between baseline and midline. Systematic or random attrition from the study was therefore a potential risk for our statistical estimates. Numerous studies have shown that in areas with high rural urban migration, attrition rates range from 18% to as high as 50%(Harold A, 2001)[18]. We performed a check for any potential bias resulting from loss of study farmers but there are no indications that the attrition in our case was systematic, and therefore the integrity of our sample was not harmed.

Data Analysis

To prove causality, we will use Generalized Linear Regression Models, especially Ordinary Least Squares regression to test for the differences in the means of the two groups

[18] Based on a review of a number of longitudinal studies from different parts of the world

(treatment and control) over several outcomes of interest. We use a treatment dummy[19] as an instrument in the analysis under the assumption that since the allocation to the treatment and control groups was random, any observed difference is a result of the project activities. Difference-in-difference analysis (DID) was also used in order to estimate the overall project impact on the farmers. This type of analysis is useful in comparing the differential effect of the project over time. Difference-in-difference analysis takes into account both the effects of the interventions and time and therefore makes adjustments for the changes that are happening in each of the groups. Take for example it is observed that the average production in the treatment group was 10 kilograms of maize at baseline. In the control group however, the average production was 11 kilograms. At midline, the production in the treatment and control groups had increased to 19 kilograms and 20 kilograms in the treatment and control groups respectively. The difference-in-difference estimator for production would therefore be;

	Baseline	**Midline**	**Difference**
Treatment	10	19	+9
Control	11	20	+9
DID estimate			9-9=0

The change in production for the treatment group relative to the control according to the DID estimate therefore did not increase from the baseline. The DID is interpreted therefore as an increase rather than the actual production value observed which in this case or the treatment group was a 9 kilogram increase.

1 Discussion

This section discusses the results of the midline evaluation for both maize and poultry farmers. They are presented in three forms. The main results are presented showing the impacts of the project interventions on the treated farmers comparing this to the outcomes among control farmers, establishing how this varied over time i.e. how much of a difference there was between the farmers during the period between baseline and midline. This difference gives us an estimate of the project impact or the economic impact of the project interventions over time. For instance, a DID effect of X% means that the outcome in treatment group increased by X% relative to the changes in the control group from baseline to midline. If there was an increase in one group and a decrease in another group for example, the DID estimate would adjust for this. We also present the condition of the farmers at follow up comparing the outcome of the treated farmers with those of the control farmers. This is basically to give a snapshot view of the observed difference between the treatment and control farmers but does not put into consideration the effects of time. The third estimation is based on gender disaggregated data, and therefore the difference between the outcomes among male and female farmers at midline and the final estimates are based on the effects of the project on the treatment farmers over time (between baseline and midline) which gives us an idea of how the farmers have progressed since they were first involved in the program.

1.1.1 Demographic Characteristics

We start by giving a quick description of the general sample as well as the demographic characteristics of the farmers. We see in Table 1 that our total number of farmers at midline was 2,109 consisting of both treatment and control farmers. The distribution of treatment and poultry farmers in each of the maize and poultry groups is about 68% treatment to 32%

[19] Coded “1” if participated in program and “0” otherwise. Algebraic expression located in the appendix section

control farmers. The ratio of treatment to control farmers is therefore 1: 1.68. The average age among farmers in our sample is 46 years, 52% of whom are female. The ratio of male to female farmers is therefore 1:1.09.

Table 2 further describes the demographics of the farmers in the treatment and control groups. We observe that there is no difference between the treatment and control groups in terms of age and gender composition with each of the groups having between 48% (control group) and 49% (treatment group) male farmers, and a less than 2 year difference in age. In both groups, about 85% of the farmers have attained at least primary level education while slightly over 60% of the farmers reported that they considered farming as they major occupation.

From an agronomic perspective, the total land holdings in both groups stood at about 1.8 acres. All of these indicators, save for the age of the farmers in the treatment and control categories were balanced, with only the age giving a statistically significant result ($p<0.05$). The actual age difference in real terms is not worrying however as a two year difference is marginal. Based on these few demographic indicators, we can conclude that the farmers in both groups are relatively homogenous in their basic observable and general demographic characteristics.

1.1.2 Adoption and Production Outcomes among Maize Farmers

Sub section 3 of table 2 gives us an overview of a number of management and production related indicators compared for the farmers in the treatment and control groups at midline only. We see that there are a number of deviations in the indicators when the two groups are compared. Treatment farmers were more likely to have purchased seed while more control farmers on the other hand used free seed. Information was also collected regarding the farm expenditures for different varying production costs including labor, transportation, inputs etc. There was a discernible difference between the treatment and control groups. Table 2, section 3 summarizes this difference but does not take into account the effects of time between the midline and baseline, and is therefore a view of the farmers at follow up. Among treatment farmers, 10% less farmers used free seeds while the number that purchased seeds increased by 10% at midline ($p<0.01$). This is almost suggestive of a net shift among treatment farmers from using free to purchasing seed. There was a similar trend among treatment farmers when asked about whether they spent on other production related costs. The difference between the treatment and control groups was an increase of 15% in fertilizer use ($p<0.01$), 3% for manure, 9% for pesticide ($p<0.01$), 4% for machinery ($p<0.1$), 5% for transportation ($p<0.01$) and 4% spent on harvesting their produce ($p<0.1$). The largest differences were therefore observed in the share of farmers spending on fertilizers, seeds and pesticides. The farmers were queried about their main source of seed and perception towards the seed that they used. There was a general preference for the seed that was purchased over the seed that was obtained for free. The free seed included seeds that were replanted, received from family, friends or neighbors. Measured on a 5 point scale ranging from “very bad” to “very good”, the farmers on average rated purchased seeds as 3.6 versus 3.3 for the free seeds. The proportion of farmers that used fixed spacing rather than broadcasting during planting also increased in the treatment group. 87.4% of farmers in the treatment group used fixed spacing in the most recent season. This was an increase of 24 percentage points (Table 3) compared to the control farmers since baseline ($p<0.05$). A larger proportion of treatment farmers also used line spacing which is one of the agronomic practices taught to the farmers. The LEAD farmers in addition to using fixed spacing also reduced the number of seeds used per hole during planting. The seed rate recommended by the program is 2 seeds per hole. This combined with proper plant spacing is expected to improve productivity by reducing competition between plants which in the short run is expected to increase maize productivity.

Table 3 shows the difference-in-difference analysis for changes observed between the baseline and follow up survey comparing the outcomes in the treatment and control

categories. We report the statistics for the control farmers at baseline as well as the relative change that was observed between the treatment and control groups over a two year period. The column titled "*treatment effect*" therefore summarizes the extent to which the treatment farmers were observed to have changed relative to the control farmers. In terms of agricultural participation, farmers in the intervention group generally seemed to demonstrate higher agricultural participation rates than control farmers. Despite the fact that farmers in both groups have about the same number of years of experience in maize cultivation, 7% more farmers in the treatment group grew maize in the most recent season. This result is significant at the 5% level suggesting a statistically significant difference. The farmers were also questioned about the agronomic practices that they applied in the previous season and there was generally increased reporting of the application of contemporary agronomic techniques in the treatment group. 13% more farmers in the treatment group mulched their plots while 10.5% more reported following a crop calendar to plan their seasonal growing activities. 17% more farmers used pesticides/ herbicides while the number of farmers that used fertilizer increased by 13 percentage points from baseline to midline relative to the control. All these were significant at the 1% level. The fraction of farmers that used irrigation remained relatively unchanged at 0.2%. The number of farmers that report irrigating their farms at baseline was only 0.7% in the comparison group. This figure is probably low as a result of the logistical implications associated with setting up an irrigation system especially considering that the farmers are in most cases small scale subsistence farmers.

The farmers were asked about their post-harvest activities including marketing and sales of their produce. Reporting the overall treatment effect and comparing to the control group, the number of farmers that reported selling their produce through contract agreements did not differ significantly from the control. The number of farmers that made contractual agreements reduced marginally by 4 percentage points while those that reported having to look for markets reduced by 5 percentage points relative to the baseline. This reduction however, is a result of an increase in the number of control farmers that also made contract agreements rather than because of the reduction in the number of treatment farmers utilizing contract sales. This is evident when looking at the situation pre and post intervention where there was a rise in the number of treatment farmers that sold their produce through contract agreements from 3% to 8% (Table 6). The subsequent increase in the control group therefore, is probably as a result of the spillover effects onto the control farmers. Given that the traders operate in the same communities as the control farmers, they are no assurances that they will not also take advantage of the presence of the traders to sell their produce. In addition, maize is a common staple with ready market and selling it through contract agreements is not very common. Asked about the sources of their inputs, the treatment farmers reported to a greater extent that they acquired it from an agro dealer. These results were significant at the 5% level. These results are suggestive of greater agricultural participation happening among maize treatment farmers.

Farm productivity is one of the most important measures of progress for the project. The farmers that were treated exhibited higher productivity compared to the control group with maize production increasing by 99 kilograms taking into consideration the changes that happened in the control group as well. Looking at the midline productivity only, the yield among treatment farmers was higher than that of the control farmer as well ($p<0.01$). The mean amount of maize sold was also higher among the intervention group with farmers selling 71 more kilograms of maize than non-intervention farmers. There was however a general decline in the productivity among the farmers from the baseline which affected both the treatment and control groups. This is likely as a result of shocks that affected both groups of farmers hence the decline observed in both categories. The production estimates were influenced by branch level variations in production between the different branches. Some branches saw higher than average increases from the baseline while others had significant drops in production during the midline (Graph 1). Out of the 10 study branches, Korogwe and Machame showed steep declines in production from baseline while production in Gallapo, Ruaha and Bunda increased substantially. The other branches recorded small

increases or decreases. In the branches that showed large declines, it was reported that as a result of erratic rains in the previous two seasons in the low altitude zone, the bi modal rainfall that are usually characteristic of the region have not been happening which has disrupted the maize growing patterns. Some other areas like Bububu, in Zanzibar do not traditionally grow maize as a staple crop with farmers choosing to grow other crops instead. Tegeta on the other hand is located in urban to peri-urban Dar essalam and therefore maize farming is not very suitable here.

1.1.3 Socio Economic Conditions among Maize farmers

We also asked the farmers about their general socio economic and financial conditions. This includes their engagement in farmers groups, access to, and use of credit as well as saving and consumption behavior. A considerably higher number of treatment farmers were members in a farmers group. There was a 51 percentage point increase from baseline to midline relative to the non-intervention farmers (Table 3).8% more treatment farmers had taken a loan ($p<0.01$) though there was a relative decline in the value of the loan. This could be due to numerous factors relating to the utility of a loan or an increase in the number of control farmers that took out a loan. For instance, it is observed that many farmers minimize their expenditures during the short rain season and this may be the same principle applied incase farmers expect a bad season[20]. This is particularly feasible because loan take up among poultry farmers, which is less sensitive to seasonal variation, was not affected. More treatment farmers however felt that a loan would contribute considerably to increasing their productivity which is an interesting finding. To gauge the household economic welfare of the farmers, we asked a few questions about food security, savings and a self-assessment of their economic status in comparison to other members of their community. There was a marginal change from baseline to midline in the number of treatment farmers relative to control farmers that reported borrowing money to cover food expenditures (<2%). The amount of savings increased by 27,000 Tsh among treatment farmers ($P<0.05$), while households in the treatment did not differ in their expression that they felt their economic conditions were better compared to other members of their community. The fraction of households that reported that they considered themselves “below average wealth” or “very poor” however decreased by 3 percentage points relative to the control farmers. The overall decline in the number of farmers reporting so decreased by 10% from baseline to midline ($p<0.01$).

To understand the food security situation in the household, we used the Household Food Security Access Scale (HFIAS) to elicit information about access to and quality of nutrition. The scale ranges from 1-27 with a lower score signifying greater food security. There were no indications that the food security situation in the treatment and control households differed. There was a 0.03 point difference between the treatment and control households. Based on the same scale, we constructed a measure for households that experienced insufficient food access based on a set of questions asking about incidences related to food shortage in the household. The proportion of households reporting food shortage declined by 1.41 percentage points in the treatment group but this was not statistically significant (Table 3).

1.1.4 Summary of the General demographic Characteristic among Poultry farmers

The same format is used for reporting the results summarizing the outcomes among poultry farmers. We report the project impact as the change for each outcome in the treated group relative to the control group, from baseline to midline and also report the direct comparison at midline between the treatment and control groups. In addition, we disaggregate the results by gender and finally report the changes occurring over time from the baseline to midline.

[20]According to an ongoing BRAC/CEGA study on the relationship between Transport Costs and Fertilizer Adoption in Tanzania.

We begin by describing the demographic characteristics of the poultry farmers after which we will discuss their poultry practices, productivity, engagement in poultry farming and socio economic conditions. Poultry farmers were on average about 45 years in age, with a non-significant difference between the treatment and the control groups. The proportion of male to female farmers was 1:1.09 implying a larger number of female farmers were engaged in poultry farming. Poultry farmers reported having on average 8 years of experience in poultry farming. The demographic characteristics are largely similar in the treatment and control groups with no apparent difference in traits.

1.1.5 Adoption, Production and Household Welfare Outcomes among Poultry Farmers

We begin by discussing the projects economic impact on the farmers reporting the results of the difference-in-difference analysis of the treatment and control households. At midline, there was a relative increase of 11% ($p<0.01$) in the number of treatment farmers that reported rearing indigenous poultry birds. There was a similar increase in the number of farmers rearing exotic poultry however the total number of farmers that reared exotic birds was only 2% of the total population that reared poultry. Indigenous birds are more popular among farmers and usually fetch more money on the market. In terms of poultry management practices, the data suggests that intervention farmers apply recommended management practices with more vigor. The difference-in-difference estimate indicates a 14 percentage point increase (Table 4) in the number of farmers that vaccinate their birds ($p<0.01$), 21% increase in the number of farmers that reported using a poultry coop ($p<0.01$) and a 13% increase in the number of poultry farmers that used drinkers and feeders ($p<0.01$). The use of poultry inputs was also higher among treated farmers with 12% more treatment farmers reporting that they bought poultry inputs and used mixed feed in the last 3 months ($p<0.05$). Between baseline and midline, the number of intervention farmers that vaccinated their birds increased from 42% to 71% while those that used poultry feed increased by 10% to about 55%. The number of farmers that kept their birds in a poultry coop and used drinkers and feeders increased by 23% and 21% respectively from baseline to midline. Keeping birds in a poultry coop rather than using extensive methods of rearing, and encouraging the use of feeders and drinkers are supposed to make poultry farming more productive by shifting to more intensive techniques.

There were also indications that poultry production increased. Table 6 reports the increase from baseline to midline for treatment farmers with most farmers registering an average of a 10 % increase in their poultry stock from the baseline. Between baseline and midline, farmers in the poultry treatment group managed to increase their current stock by 4 birds relative to the control group ($p<0.05$). Reporting the median, at midline, the number of birds owned in each of the groups was 15 birds. Poultry productivity, which was measured as the sum of the current stock together with chicken consumed and sold in the last 3 months, was 23 birds in the treatment versus 20 in the control group ($p<0.1$). The number of eggs sold in the last 3 months was a median of 60 in both groups. The income from egg production was therefore similar between groups. The mean egg production and income in the treatment group was nevertheless higher. There is also increased economic activity among treated households with poultry farmers reporting that they were more actively involved in the sale of poultry products. Table 4 shows the increase in the number of poultry farmers that said they sold chicken. The estimate was 52% among intervention farmers compared to 44% in the control group ($p<0.05$). In terms of the mortality rate of poultry, the number of treatment farmers that lost birds was less than in the comparison group. Treatment farmers on average lost roughly 2 less birds in the last 3 months. Poultry production was estimated at a median of 5 eggs per week. However, the metrics for egg production at baseline and at midline differed in that during the baseline, the farmers were asked how many eggs they had produced in the last 7 days. In the midline however, this same question was asked in reference to the last 3 months. Changes in egg production are very dynamic and a lot can happen within a 3 month period. Production may be irregular and therefore there is a

possibility of recall bias and information reported over a 3 month period is likely to be less accurate.

There was a shift in the sales and marketing activities of the farmers too. The difference-in-difference estimate for farmers that made contractual agreements when selling their poultry produce rose in the treatment group by 2% relative to the comparison group while the number that had to look for markets increased by 6%. From baseline to midline, the number of poultry farmers that sold through contractual agreements increased by 6% ($p<0.01$). There was increased participation in the community groups with 48% of intervention farmers belonging to a farmers group in their community. Also, 8% more farmers had taken out a loan to facilitate production though the value of the agricultural loans only increased slightly. 20% more treatment farmers however felt that a loan would help them increase their productivity. There was a strong positive association between productivity and credit for both maize and poultry farmers implying that loans are useful for increasing productivity in an agricultural household. The data also suggested that households that have a better economic rating are more likely to take up a loan. The households were asked to rank themselves on a 5 point scale from “significantly above average” to “significantly below average” to assess their self-reported welfare. The percentage that reported that they considered themselves “very poor” or “below average wealth” decreased by almost 10% among intervention farmers relative to the control group. The HFIAS score among treatment households was 0.4 points higher than in the control households, though this was non-significant.

1.1.6 Outcomes among Male and Female Farmers

Disaggregating the data by gender, we intend to see if there are any variations in the indicators that may be affected on account of gender specific differences. A majority of agricultural activities in SSA are performed by female farmers who are many times intricately involved in the production process. However, there are a number of constraints that female farmers face especially in respect to access and control of the factors of the production and determining how the returns from agricultural production are utilized. Comparing the basic demographic characteristics of male and female farmers, we see that male farmers are on average 3 years older than female farmers in the cohort ($p<0.01$). Male farmers are also more likely to have attained a higher level of education with 88% having at least primary level education compared to 83% of female farmers ($p<0.01$). Around 6% more male farmers reported that they consider agriculture to be their main occupation ($p<0.01$). In terms of the agricultural practices and farm management practices, there appears to be a balance in the indicators of application of specific management practices. The use of project recommended agricultural practices is well taken up by both male and female farmers. The proportion of male and female farmers that spent money on different production costs did not differ statistically but there was a consistently higher proportion of male farmers reporting expenditures. For instance, 73% of male versus 70% of female farmers acquired seeds, 33% versus 37% bought fertilizer, 18% versus 12% bought manure, 16% versus 15% bought pesticide, 19% versus 16% spent on machinery or equipment while 10% in both groups spent on harvesting or processing (Table 7). By no means does this confirm any skew between groups however. The general approval rating of the program interventions and activities stands at around 74% by both male and female farmers who reported that they were very satisfied with the project activities.

When asked about access and control of land resources however, more female farmers reported that the household head has total control in the agricultural decisions in the household (41% versus 33%). The data also suggested that households in which farmers reported that decisions were based on consensus between the household head and the spouse had higher productivity. This was especially so for maize farmers (Table 8).

The amount of maize produced and sold in each of the categories did not vary much by gender. Among poultry farmers, many of the indicators were balanced with a few showing

divergence when disaggregated by gender. The use of different poultry management practices by male and female farmers largely matched in both groups with slightly over 50% in both groups using mixed feeds. The number of farmers that controlled the ventilation and temperature for their poultry was estimated at about 32% in both groups, with 58% of male farmers and 60% of female farmers reporting that they house their birds in a poultry coop. About 35% of the poultry farmers had experienced quality issues with the inputs they acquired, a majority of which were blamed on low quality. On a scale of 5, the poultry farmers rated the quality of seed on average at about 3.5 which is satisfactory but still suggests that there is scope for improvement. The use of vaccination among the farmers stood at 66% in both categories. The general take up of different technologies among the farmers seems therefore to indicate that there are no apparent constraints associated with the access, use and application of training and services based on gender. To test their general knowledge about recommended poultry practices, we asked the farmers to mention any poultry management techniques that they could apply as farmers to help improve their production. The farmers were scored based on the number that they got correct and received no score for a wrong answer. Male farmers scored slightly higher (3.6) while female farmers obtained a score of 3.4 though this was not statistically significant.

Regarding poultry production, marketing and sales, the estimated number of birds owned by the farmers was 21 and 20 birds for male and female farmers respectively. Male farmers in reference to the previous 3 months lost 6 birds compared to 8 birds for female farmers ($P<0.01$). 49% of both male and female farmers reported selling poultry in the last 3 months. The general participation rates among the treatment farmers was high with participation among female farmers at 92% and male participation only 3% less. 74% of male poultry farmers and 67% of female poultry farmers reported that they were very satisfied with the LEAD programs training regime and activities. Male farmers however appeared to report marginally better conditions when reporting their welfare with 2% less ($p<0.05$) borrowing money to cover food expenditure, and scoring better on food security ($p<0.05$).

1.1.7 Comparing the Outcomes among Treatment Farmers between Baseline and Follow Up

We finally compare the outcomes of the treatment farmers from baseline to midline to estimate how much they have changed since their involvement in the program and we are particularly interested in the indicators of productivity, application of crop and poultry management techniques, access to credit and financing and how these are associated with their general experience during the intervention. Results for this section are presented in Table 6.

Land usage under agriculture did not vary much between baseline and follow up with farmers allocating about 1.9 acres to agricultural production. An overwhelming majority (92%) of farmers grew maize which was about the same proportion at baseline. Considering that maize is one of the primary food crops in many parts of Tanzania, this is a consistent finding. For maize farmers, there were a number of indicators that suggested increased rates of take up, increased participation and greater use of inputs. Considering the period from baseline to midline, there was an increase of 17% in the number of farmers that used mulch, 20% of the farmers increased their use of fertilizer during production, there was also an improvement of 18% that used pesticides/ herbicides while 4% more farmers irrigated their farms. All of these were significant at the 1% level. The number of farmers that sold their produce through contract agreements rose from 2.5% to 8% while access to credit increased by 19%. Maize production was recorded at 753 kilograms. The yield which is calculated by dividing the total maize production by the farmers land holdings was about 400 kgs per acre.

A similar trend was observed for poultry farmers with vaccination rates increasing by almost 30% ($p<0.01$). There was also increased application of poultry management techniques with the improvement in the number of farmers that used poultry inputs, used mixed feeds, kept their birds in a coop and using drinkers and feeders increasing by 39% ($p<0.01$), 10%

(p<0.01), 23%(p<0.01) and 20% (p<0.01) respectively. There was a strong correlation between farmers that used inputs and general productivity (Table 7)

The general household welfare for the farmers appear to have seen an improvement as well with a 4 percentage points reduction in the number of farmers reporting that in the previous year they had at one point borrowed money to meet their household food needs. The self-reported wealth ranking of the treatment farmers improved considerably from midline with almost 10% less farmers reporting that they considered themselves “very poor” or “below average wealth” in comparison to other households within their community (p<0.01). They also score better on the household food security scale scoring 3.159 (p<0.01) while increasing their savings by 40,000 Tshs. The number of farmers that reported selling their poultry products through a contractual agreement rose by 6%. This was higher for birds than for eggs.

2 Conclusion and Recommendation

The involvement of large sections of the population in agriculture is common in several parts of SSA including Tanzania, and is normally as a result of factors that can be described as opportunistic or intentional. This is since most households especially in the more rural areas would usually be in possession of farm land and therefore land on which they can practice agriculture hence improve their household’s food security, or else produce as a source of income. For this reason, a disproportionately large number of households consider themselves to be farming households, practicing one form or another of crop or animal husbandry. In most cases, farming is done on small fragmented pieces of land or even on small sections of what is meant to be homestead land. This would qualify as opportunistic farming, making use of the most marginal of farm lands for agriculture. The alternative are farmers who actual practice farming with the intention of treating it as an enterprise rather than out of convenience. Poultry farming on the other hand does not require nearly as much land as crop farming does but many agricultural households are in most cases involved in both. In many instances, households that are considered to be agricultural households are in addition involved in numerous other economic activities. While many households are involved in agriculture and have several years of experience, the adoption and use of contemporary agricultural techniques is slow in a majority of cases. This may be as a result of various barriers to utilization including poor infrastructure, a lack of market access, lack of information and credit, poor agronomic practices etc. The consensus however is that most smallholder farmers produce at less than optimal rates and have the potential to improve their practices and productivity. Interventions to fill this gap are therefore critical in improving the eventual productivity, incomes and household welfare.

The LEAD project interventions were conceived with the intention of filling this gap in information and market access. From the evidence, it is clear that the project activities have generally affected the application of crop and poultry management practices among both male and female farmers and the inference from the data can be made that farmers that applied these techniques were more likely to have higher production. The adoption of different practices by both maize farmers showed an increase from the baseline as well as improvement among project farmers when compared to non-project farmers. There were also improvements in some of the outcomes of the non-project farmers which could be attributed to the spillover effects of the project. Since the control farmers had access to demonstration farms, traders and other project interventions that were happening in the communities, it is likely that some of the benefits may have rubbed off them. The same applies for poultry farmers who were observed to be increasingly involved in project activities, and had adopted a number of beneficial poultry management practices post intervention. There is also a strong association between farmers that applied these techniques and general productivity suggesting a causal interaction (Table 8).

Translating the project activities into actual measurable impacts is therefore largely dependent on the ability of the farmers to put into practice what they have learnt on farm which is itself dependent on a number of non-farmer specific factors. The use of different management practices may have cost implications which require additional investment over and above the typical seasonal costs. For instance fertilizer which showed a strong association with increased productivity is considered to be too expensive for most small holder farmers. Access to fertilizer by farmers is therefore also influenced by the availability of road infrastructure, presence of enough inputs dealers etc. A parallel study on the project for instance showed that input dealers locate themselves closer to areas with good roads and major towns and the further away from these places, the higher the cost of fertilizer. Taking fertilizer as an example, while we can confirm that indeed there was an increase in the use of fertilizer by project farmers, we cannot sufficiently answer the question about why a number of farmers that didn't use fertilizer opted out. This may be attributed to either to farmer specific characteristics like attitudes, age, and income or else to factors beyond their control such as infrastructure or the cost of input among others. The observation though is that treatment farmers do appear to be more agriculturally involved in a sense which is seen through their generally higher rates of application of agronomic and poultry management practice.

The data also reveals that the application and use of different management practices does not vary greatly by gender with most indicators in each category producing similar estimates. There are however some slight hints of female farmers facing greater challenges once we look at the welfare indicators as expressed in the fewer decision making opportunities, lower food security score, savings and borrowing behavior. Male farmers also consistently reported generally higher estimates even though not all were of statistical significance. This may however be a result of under or over reporting by either of the farmer categories. Decision making in the household in terms of who has the influence in making decisions about allocation of land resources or how the returns from production are spent are critical in household improvement. About a third of women and men report that household decisions are made entirely by the household head but evidence from the data insinuates that these households also have poorer outcomes while households where decisions are made by both the household head and spouse have better production outcomes. This is an interesting insight into the influence and role of gender in agricultural households. The LEAD projects choice to target a majority female farmers therefore has the potential to shift gender and household dynamics in the right direction. The project has been instrumental in this sense, increasing significantly the fraction of households that approach agricultural decisions from a gender positive point of view.

The project has made strides in contributing to the objective of positively influencing farming practices and improving social and economic welfare, as observed by the increases in many of the indictors. All indications show that many of the first order outcomes relating to improving the adoption and use of proper crop and poultry management techniques were achieved in most part. However, it is expected that the translation of this into higher order outcomes and the subsequent contribution to livelihoods will require a combination of time and a deeper understanding of the specific challenges inhibiting full farmer participation, which could easily be constrained by possible ceiling effects, especially among non-adopters. Adoption of new practices is an ongoing process and most of the study farmers have had around one year of exposure to the program and hence the endline survey does entirely reflect the project impact based on the full 4 year exposure to the project interventions. The influence of the project on adoption and the subsequent observed increases in productivity in the short run suggest that the LEAD interventions have had a positive net effect on participating farmers with potentially larger impacts in the long run.

3 Bibliography

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Table 1: General Sample Description

	Number of Observations	Value
(1)	(2)	(3)
Age (Mean in Years)	2,044	45.56
Gender of the Farmer (%ge female)	1,068	52.25%
Ratio of Male to Female Farmers	2,044	1 : 1.09
Number of treatment Households	1,321	62.64%
Ratio of control to treatment households	2,109	1 : 1.68
Attrition Rate (%ge)	1,763	46%
Number of treatment Maize farmers	1,434	62%
Number of treatment Poultry farmers	1,176	62%
Number of control Maize farmers	886	38%
Number of control poultry farmers	722	38%

Notes: This table summarizes the sample characteristics based on a total sample size of 2,109 farmers. This number consists of only the farmers that were traced back at follow up and excludes all farmers that could attrited from the study.

Table 2: Table Comparing the Outcomes between Treatment and Control Farmers

	Treatment		Control		
Variable	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Population**
(1)	(2)	(3)	(4)	(5)	(6)
1. Household Demographic characteristics					
Gender of the farmer (%ge Male)	49.31%	(0.0224)	47.80%	(0.0176)	All Farmers
Age (in years)	45.15**	(0.611)	46.51	(0.481)	All Farmers
Level of education (%ge completed at least primary education)	85.90%	(0.0159)	84.20%	(0.0125)	All Farmers
Farmers reporting crop/ poultry farming as main occupation	64.15%	(0.0217)	61.30%	(0.0171)	All Farmers
2. Farm Demographic characteristics					
Total agricultural land (own) in acres	1.7484	(0.0739)	1.823	(0.0579)	All Farmers
Total agricultural land (rented) in acres	0.56	(0.137)	0.64	(0.108)	All Farmers
3. General agronomic practices, Knowledge & perceptions					
farmers that used free seed in previous season (%ge)	22.5% ***	(0.0282)	32.90%	(0.0225)	Maize Farmers
Farmers that bought seed in previous season (%ge)	75.84% ***	(0.0287)	66.10%	(0.0229)	Maize Farmers
Perception of quality of free seed (On scale of 0-5)	3.2504	(0.0688)	3.233	(0.0512)	Maize Farmers
Perception of quality of purchased seed (On scale of 0-5)	3.5786	(0.0532)	3.624	(0.0435)	Maize Farmers
Proportion of farmers that spent on seeds (%ge)	74.88% ***	(0.0272)	65.90%	(0.0214)	Maize Farmers
Proportion of farmers that spent on fertilizer (%ge)	40.6% ***	(0.0285)	26.00%	(0.0224)	Maize Farmers
Proportion of farmers that spent on manure/ compost (%ge)	16.30%	(0.0217)	13.30%	(0.0170)	Maize Farmers
Proportion of farmers that spent on pesticide/ herbicide/ fungicide (%ge)	19.15% ***	(0.0218)	10.20%	(0.0172)	Maize Farmers
Proportion of farmers that spent on machinery/ equipment rent (%ge)	18.72% *	(0.0228)	14.70%	(0.0179)	Maize Farmers
Proportion of farmers that spent on transportation cost (%ge)	12.27% ***	(0.0184)	7.45%	(0.0145)	Maize Farmers
Proportion of farmers that spent on harvesting/processing (%ge)	16.44% *	(0.0215)	12.40%	(0.0169)	Maize Farmers
Farmers making contractual agreement before selling maize (%ge)	7.90%	(0.0399)	12.20%	(0.0335)	Maize Farmers
Farmers that Sold maize produce collectively (%ge)	4.49%	(0.0284)	4.05%	(0.0238)	Maize Farmers
Seed rate (Number of seeds per hole)	2.3662***	(0.0332)	2.465	(0.0270)	Maize Farmers
Used fixed spacing during planting (%ge)	87.4% ***	(0.0257)	57.10%	(0.0205)	Maize Farmers
Practiced Line spacing (%ge)	95.31% ***	(0.0204)	85.70%	(0.0174)	Maize Farmers
Reporting agro dealer as main source of fertilizer (%ge)	69.7%*	(0.0302)	64.40%	(0.0245)	Maize Farmers
Reporting agro dealer as main source of seed (%ge)	94.58% ***	(0.0204)	87.50%	(0.0167)	Maize Farmers
Maize Knowledge score (Scale of 0-5)	4.443	(0.129)	4.288	(0.121)	Maize Farmers
Mean maize production in kilograms/ acre	402.18***	(29.93)	318.7	(23.49)	Maize Farmers
Median maize production in kilograms/ acre	250	(31.77)	200	(24.93)	Maize Farmers
Mean maize production in Kilograms	759.4***	(63.73)	572.9	(50.05)	Maize Farmers
Median maize production in Kilograms	100***	(32.69)	300	(25.67)	Maize Farmers
4. Household food security and Welfare					
Ever borrowed money to cover household food expenses (%ge)	5.72%	(0.0139)	5.42%	(0.0109)	Maize Farmers
Saved at least 10,000 Tsh in last 6 months (%ge)	59.51% **	(0.0299)	53.00%	(0.0235)	Maize Farmers
Reporting insufficient access to food in last 4 weeks (%ge)	26.78%	(0.0271)	29.80%	(0.0213)	Maize Farmers
farmers reporting below average wealth compared to other community members (%ge)	27.37%	(0.0272)	29.60%	(0.0214)	Maize Farmers

Notes: This table is based on the results of an OLS regression testing for mean difference of the treatment and control groups. Column (1) describes the variable used in each row. Columns (2) and (4) provide the mean of the relevant variable for the treatment and control farmers respectively. Columns (3) and (5) provide the standard deviation for the relevant variable for the treatment and control farmers respectively while Column (6) describes the population for which the analysis was done .
Significance level are denoted by * p<0.1 , ** <p<0.05 , *** p<0.01

Table 3: Difference in Difference Analysis showing Average Outcomes among Maize Farmers

	Treatment Effect			Control			
Variable	N	Mean	Std Dev	N	Mean	Std Dev	Population
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1: Training and technology adoption							
Farmers growing maize (%ge)		6.86% ***	(0.0250)		92.80%	(0.0123)	Maize Farmers
Used Mulch (%ge)		13.2% ***	(0.0250)		4.14%	(0.00983)	Maize Farmers
Followed crop calendar (%ge)		10.5% ***	(0.0299)		91.70%	(0.0136)	Maize Farmers
Used pesticide (%ge)		16.8% ***	(0.0346)		16.30%	(0.0182)	Maize Farmers
Irrigated plot/ farm (%ge)		0.23%	(0.0153)		0.73%	(0.00420)	Maize Farmers
Fertilizer Usage (%ge)		12.6% ***	(0.0445)		42.30%	(0.0244)	Maize Farmers
Used fixed spacing during planting (%ge)		24.1% ***	(0.0413)		32.60%	(0.0231)	Maize Farmers
Seed rate (Number of seeds per hole)		-0.148**	(0.0671)		2.526	(0.0370)	Maize Farmers
2. Maize production, consumption and sales							
Mean Maize production in last season (kgs)		98.91	(91.17)		781.5	(51.65)	Maize farmers
Median maize produced in last season(kgs)		0	(76.22)		400	(42.37)	Maize farmers
Mean maize yield in kilograms per acre		54.45	(45.13)		473.3	(27.02)	Maize farmers
Median maize yield in kilograms per acre		50	(64.15)		300	(33.33)	Maize farmers
Income from maize production (Mean)		58,687	(52,132)		492,334	(30,618)	Maize farmers
Income from maize production (Median)		32,500	(49,473)		260,000	(27,485)	Maize farmers
Maize Sold (Kgs)		70.7	(55.55)		291.4	(34.17)	Maize farmers
Farmers making contractual agreement before selling maize (%ge)		-3.80%	(0.0455)		3.00%	(0.0121)	Maize farmers
Farmers reporting having to look for market for selling maize (%ge)		-4.80%	(0.0820)		44.00%	(0.0352)	Maize farmers
3. Program participation, knowledge & perceptions							
Belongs in a farmers group (%ge)		51.4% ***	(0.0291)		5.19%	(0.0106)	Maize farmers
Ever taken a loan to finance agricultural activites (%ge)		8.39% ***	(0.0246)		3.39%	(0.00860)	Maize farmers
Value of the Agricultural loan (Tshs)		-176,296	(261,272)		472,333	(216,975)	Maize farmers
Think that loans are useful for increasing productivity (%ge)		18.6% ***	(0.0401)		67.00%	(0.0224)	Maize farmers
4. Household food security and Welfare							
Food security score (1-27) **lower scores represent better food security*		0.156	(0.425)		3.935	(0.229)	Maize farmers
Ever borrowed money to cover food expenditures (%ge)		-1.95%	(0.0223)		8.35%	(0.0132)	Maize farmers
Money saved in last 6 months (Tsh)		27,439**	(13,848)		87,055	(7,665)	Maize farmers
Saved at least 10,000 Tsh in last 6 months (%ge)		8.09%*	(0.0421)		60.70%	(0.0234)	Maize farmers
farmers reporting below average wealth compared to other community members (%ge)		-3.15%	(0.0393)		32.30%	(0.0219)	Maize farmers
Reporting insufficient access to food in last 4 weeks (%ge)		-1.41%	(0.0392)		33.4%s	(0.0218)	Maize farmers
Perception in comparison to other households in their community		-0.031	(0.0510)		3.282	(0.0278)	Maize farmers

Notes: This table is based on the results of a difference in difference analysis of the treatment and control farmers pre and post intervention. Column (1) describes the variable used in each row. Columns (2) describes the difference between the change in the treatment group, over and above the change in the control group . Column (4) provide the mean value of the control group at baseline. Columns (3) and (5) provide the standard deviation for the relevant variable for the treatment and control farmers respectively while Column (6) describes the population for which the analysis was done .
Significance level are denoted by * p<0.1 . ** <p<0.05 . *** p<0.01

Table 4: Table Comparing the Outcomes between Poultry Treatment and Control Farmers

	Treatment			Control			
Variable	N	Mean	Std Dev	N	Mean	Std Dev	Population
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Poultry Production							
Total poultry production in last 3 months (mean)		30.02	(1.892)		27.2	(1.534)	Poultry farmers
Total poultry production in last 3 months (median)		23*	(1.609)		20	(1.304)	Poultry farmers
Reporting sold poultry through contractual agreement (%ge)		6.77%	(0.0290)		9.17%	(0.0241)	Poultry farmers
Reporting sold eggs through contractual agreement (%ge)		2.86%	(0.0365)		4.76%	(0.0289)	Poultry farmers
Mean Number of eggs sold in last 3 months		88	(14.70)		79.77	(11.90)	Poultry farmers
Median Number of eggs sold in last 3 months		60	(20.38)		60	(16.50)	Poultry farmers
Egg production per week (Mean)		7.36	(1.225)		6.648	(0.992)	Poultry farmers
Egg production per week (Median)		5	(1.698)		5	(1.375)	Poultry farmers
Estimated income from total poultry production(Mean)/(Tsh)		360,187	(22,704)		326,404	(18,407)	Poultry farmers
Estimated income from total poultry production (Median)/(Tsh)		276,000*	(19,303)		240,000	(15,649)	Poultry farmers
Estimated mean income from current stock of poultry birds		254,295 *	(18,892)		221,433	(15,395)	Poultry farmers
Estimated median income from current stock of poultry birds		180,000	(12,285)		180,000	(10,011)	Poultry farmers
Estimated income from eggs (Mean)/(Tsh)		24,086	(4,243)		23,040	(3,430)	Poultry farmers
Estimated income from eggs (Median)/(Tsh)		16,500	(4,069)		16,500	(3,290)	Poultry farmers
Total income from total bird/eggs production (Mean)		384,273	(NA)		349,444	(NA)	Poultry farmers
Total income from total bird/eggs production (Median)		292,500	(NA)		256,500	(NA)	Poultry farmers
Percentage of HH that sold chicken (%ge)		51.59% **	(0.0374)		44.00%	(0.0302)	Poultry farmers
Percentage of HH that consumed chicken (%ge)		66.29% *	(0.0347)		72.90%	(0.0281)	Poultry farmers
Number of local chicken that died		6.99	(0.734)		7.56	(0.594)	Poultry farmers
Sold Poultry birds collectively (%ge)		4.14% **	(0.0182)		0.00%	(0.0151)	Poultry farmers
Sold eggs collectively (%ge)		4.29%	(0.0315)		0.00%	(0.0249)	Poultry farmers
B. Household food security and Welfare							
Ever borrowed money to cover household food expenses		8.67%	(0.0193)		9.97%	(0.0152)	Poultry farmers
Saved at least 10,000 Tsh in last 6 months (%ge)		70.06% **	(0.0312)		63.70%	(0.0246)	Poultry farmers
Reporting insufficient access to food in last 4 weeks (%ge)		30.58%	(0.0310)		32.10%	(0.0244)	Poultry farmers
Farmers reporting below average wealth compared to other community members (%ge)		18.07% **	(0.0270)		24.70%	(0.0212)	Poultry farmers

Notes: This table is based on the results of an OLS regression testing for equality of the two groups. Column (1) describes the variable used in each row. Columns (2) and (4) provide the mean of the relevant variable for the treatment and control farmers respectively. Columns (3) and (5) provide the standard deviation for the relevant variable for the treatment and control farmers respectively. Column (6) provides the p-value associated with the test of equality of the two means. Significance level are denoted by * p<0.1 , ** <p<0.05 , *** p<0.01

Table 5: Difference in Difference Analysis showing Average Outcomes among Poultry Farmers

	Treatment Effect		Control		
Outcome	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Population**
(1)	(2)	(3)	(4)	(5)	(6)
1.Poultry rearing practices and technology adoptation					
Farmers rearing indigenous poultry bird (%ge)	11.2% ***	-0.0315	92.20%	-0.0141	Poultry farmers
Farmers rearing hybrid poultry bird (%ge)	11.3% ***	-0.0341	7.76%	-0.0141	Poultry farmers
Farmers experience in poultry rearing (In years)	-0.0288	-0.762	8.006	-0.399	Poultry farmers
Vaccinated poultry (%ge)	14.4% ***	-0.0489	41.60%	-0.0265	Poultry farmers
Used poultry unit for keeping poultry birds (%ge)	21.2% ***	-0.0497	49.70%	-0.0269	Poultry farmers
Used drinkers and feeders for poultry birds (%ge)	12.5% ***	-0.0396	13.60%	-0.0184	Poultry farmers
Aqcuired poultry inputs (%ge)	12.4% **	-0.0501	48.80%	-0.0269	Poultry farmers
Used mixed feeds for poultry (%ge)	11.7% **	-0.0473	39.60%	-0.0263	Poultry farmers
Made contractual agreement before selling poultry produce (%ge)	-1.70%	-0.0333	1.61%	-0.0113	Poultry farmers
Farmers reporting having to look for market for sale of poultry (%ge)	5.58%	-0.0783	53.20%	-0.0449	Poultry farmers
Farmers making contractual agreements before for sale of eggs (%ge)	0.79%	-0.0538	6.35%	-0.031	Poultry farmers
Farmers reporting having to look for market for sale of eggs (%ge)	5.65%	-0.123	69.80%	-0.0583	Poultry farmers
2. Poultry Production					
Number of local birds currently owned (Mean)	4.306**	(1.898)	20.98	(1.078)	Poultry farmers
Number of local birds currently owned (Median)	0	(1.707)	16	(0.906)	Poultry farmers
Income from Poultry (Mean)	51,674**	(22,778)	251,706	(12,931)	Poultry farmers
Income from Poultry (Median)	0	(20,484)	192,000	(10,875)	Poultry farmers
3. Program participation in Farmers Groups					
Belongs to a farmers group (%ge)	48.4% ***	-0.0343	8.31%	-0.0145	Poultry farmers
Ever taken a loan to finance agricultural activites (%ge)	8.01% ***	-0.0308	6.09%	-0.0126	Poultry farmers
Value of the Agricultural loan (Tshs)	39,797	(131,329)	457,955	(97,010)	Poultry farmers
Think that loans are useful for increasing productivity (%ge)	19.9% ***	-0.0424	76.20%	-0.0224	Poultry farmers
B. Household food security & Welfare					
Food security score (1-27) *lower scores represent better food security	-0.383	-0.443	3.698	-0.222	Poultry farmers
Ever borrowed money to cover food expenditures (%ge)	-5.88% **	(0.0270)	6.65%	-0.0131	Poultry farmers
Money saved in last 6 months	19,623	-22,842	116,296	-9,341	Poultry farmers
Saved at least 10,000 Tsh in last 6 months (%ge)	13.1%***	(0.0445)	69.80%	(0.0248)	Poultry farmers
Farmers reporting below average wealth compared to other community members (%ge)	-9.58% **	(0.0411)	29.40%	(0.0229)	Poultry farmers
Reporting insufficient access to food in last 4 weeks (%ge)	-8.35% *	(0.0448)	33.00%	(0.0249)	Poultry farmers
Perception in comparison to other households in their community (On a Scale of 0-5)	-0.139**	(0.0559)	3.255	(0.0304)	Poultry farmers

Notes: This table is based on the results of a difference in difference analysis of the treatment and control farmers pre and post intervention. Column (1) describes the variable used in each row. Columns (2) describes the difference between the change in the treatment group, over and above the change in the control group . Column (4) provide the mean value of the control group at baseline. Columns (3) and (5) provide the standard deviation for the relevant variable for the treatment and control farmers respectively while Column (6) describes the population for which the analysis was done .
Significance level are denoted by * p<0.1 , ** <p<0.05 , *** p<0.01

Table 6: Table Comparing the Outcomes between Baseline and Midline Farmers

	Midline			Baseline			
Variable	N	Mean	Std Dev	N	Mean	Std Dev	Population
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Maize Production							
Total household land size (In acres)		2.5683	(0.156)		2.552	(0.110)	All farmers
Land used for agriculture (In acres)		1.85	(0.0935)		1.702	(0.0525)	All farmers
Ever borrowed money to cover food expenses (%ge)		5.72% ***	(0.0144)		10.60%	(0.0102)	Maize farmers
Saved at least 10,000 Tsh in last 6 months (%ge)		59.52%	(0.0260)		59.10%	(0.0184)	Maize farmers
Reporting below average wealth compared to other community members (%ge)		27.34% **	(0.0242)		33.20%	(0.0171)	Maize farmers
Reporting insufficient access to food in last 4 weeks (%ge)		26.78% **	(0.0240)		31.80%	(0.0170)	Maize farmers
Farmers that grew maize (%ge)		92.16%	(0.0141)		92.30%	(0.00999)	Maize farmers
Practiced mulching (%ge)		21.93% ***	(0.0179)		4.23%	(0.0127)	Maize farmers
Used crop calender (%ge)		88.96% *	(0.0161)		92.00%	(0.0114)	Maize farmers
Used fertilizer (%ge)		63.1% ***	(0.0269)		43.40%	(0.0190)	Maize farmers
Spent on pesticide/ herbicide/ fungicide (%ge)		30.4% ***	(0.0221)		12.50%	(0.0156)	Maize farmers
Practiced irrigation (%ge)		5.45% ***	(0.00980)		1.21%	(0.00693)	Maize farmers
Sold maize produce collectively (%ge)		4.5% *	(0.0146)		1.67%	(0.00838)	Maize farmers
Sold maize produce through contract agreement (%ge)		7.87% ***	(0.0184)		2.50%	(0.0106)	Maize farmers
Had to look for market for produce (%ge)		51.71%	(0.0459)		47.80%	(0.0264)	Maize farmers
Amount spent on maize transportation last season (In Tsh)		10,350***	(2,714)		33,269	(2,207)	Maize farmers
Amount of maize produce consumed (In kgs)		216.34***	(35.56)		49.54	(25.44)	Maize farmers
Mean quantity maize produced (In kgs)		753.0*	(59.90)		864	(42.35)	Maize farmers
Median quantity maize produced (In kgs)		400	(53.64)		400	(37.93)	Maize farmers
Mean maize yield in kgs/acre		402.2***	(30.33)		502.4	(20.26)	Maize farmers
Median maize yield in kgs/acre		250	(36.01)		300	(24.06)	Maize farmers
quantity maize sold (In kgs)		221.24 **	(36.39)		296.5	(25.73)	Maize farmers
Mean Income from maize (In kgs)		455,443**	(33,018)		536,022	(23,413)	Maize farmers
Median Income from maize (In kgs)		260,000	(34,911)		292,500	(24,756)	Maize farmers
B. Poultry Production							
Raised local poultry in last 6 months (%ge)		88.11% ***	(0.0172)		92.70%	(0.0121)	Poultry farmers
Raised hybrid poultry in last 6 months (%ge)		32.62% ***	(0.0217)		6.12%	(0.0154)	Poultry farmers
vaccinated poultry (%ge)		71.2% ***	(0.0288)		42.20%	(0.0200)	Poultry farmers
Current stock of local and improved birds (Mean)		21.52	(1.143)		19.05	(0.809)	Poultry farmers
Current stock of local and improved birds (Median)		15	(1.024)		15	(0.834)	Poultry farmers
Estimated mean income from poultry sales (Current stock)		254,295*	-14,458		228,610	(10,079)	Poultry farmers
Estimated median income from poultry sales (Current stock)		180,000	(12,712)		192,000	(8,862)	Poultry farmers
used poultry inputs (%ge)		75.2% ***	(0.0278)		36.30%	(0.0193)	Poultry farmers
used mixed feed (%ge)		54.9% ***	(0.0302)		44.80%	(0.0210)	Poultry farmers
kept birds in a poultry coop (%ge)		63.2% ***	(0.0295)		40.00%	(0.0205)	Poultry farmers
used modern drinkers/ feeders (%ge)		34.1% ***	(0.0250)		13.90%	(0.0174)	Poultry farmers
Reporting sold poultry through contractual agreement (%ge)		6.77% ***	(0.0180)		0.92%	(0.0134)	Poultry farmers
Ever borrowed money to cover food expenses (%ge)		8.65%	(0.0175)		11.20%	(0.0123)	Poultry farmers
Saved at least 10,000 Tsh in last 6 months (%ge)		70.07% **	(0.0275)		63.10%	(0.0194)	Poultry farmers
farmers reporting below average wealth compared to other community members (%ge)		18.0% ***	(0.0250)		32.30%	(0.0177)	Poultry farmers
Reporting insufficient access to food in last 4 weeks (%ge)		30.62%***	(0.0277)		39.80%	(0.0196)	Poultry farmers
Sold Poultry birds collectively (%ge)		4.14% ***	(0.0135)		0%	(0.0100)	Poultry farmers
Reporting had to look for market for poultry (%ge)		42.06%	(0.0454)		47.20%	(0.0337)	Poultry farmers
Reporting sold eggs through contractual agreement (%ge)		2.86%	(0.0292)		3.66%	(0.0198)	Poultry farmers
Sold eggs collectively (%ge)		4.29% *	(0.0225)		0%	(0.0153)	Poultry farmers
Reporting had to look for market for eggs (%ge)		30.0% ***	(0.0785)		56.10%	(0.0533)	Poultry farmers
C. Household food security & Welfare							
Member of a farmers group (%ge)		73.2% ***	(0.0142)		7.20%	(0.0100)	All farmers
Took out a loan (%ge)		22.48% ***	(0.0128)		3.98%	(0.00903)	All farmers
value of the loan taken		507,030	(88,494)		427,941	(81,692)	All farmers
Report a loan can help increase productivity (%ge)		77.3% ***	(0.0174)		67.00%	(0.0123)	All farmers
Ever borrowed money to cover food expenses (%ge)		7.07% ***	(0.0112)		10.90%	(0.00789)	All farmers
Amount saved (Tsh)		154,996***	(13,019)		113,388	(9,204)	All farmers
Saved at least 10,000 Tsh in last 6 months (%ge)		64.27% *	(0.0189)		60.90%	(0.0134)	All farmers
farmers reporting below average wealth compared to other community members (%ge)		23.14% ***	-0.0175		32.80%	(0.0124)	All farmers
Reporting insufficient access to food in last 4 weeks (%ge)		28.5% ***	(0.0182)		35.40%	(0.0129)	All farmers
self reported welfare in comparison to other HH in community		3.159***	(0.0230)		3.291	(0.0163)	All farmers

Notes: This table is based on the results of an OLS regression testing for mean difference between baseline and midline. Column (1) describes the variable used in each row. Columns (2) and (4) provide the mean of the relevant variable for the midline and baseline respectively. Columns (3) and (5) provide the standard deviation for the relevant variable midline and baseline respectively while Column (6) describes the population for which the analysis was done.
Significance level are denoted by * p<0.1 , ** <p<0.05 , *** p<0.01

Table 7: Table Comparing the Outcomes between Female and Male Farmers

	Male Farmers			Female Farmers			
Variable	N	Mean	Std Dev	N	Mean	Std Dev	Population
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Demographic							
Age (In years)		47.24***	(0.590)		44.01	(0.411)	All farmers
Has at least primary level education (%ge)		0.8755***	(0.0154)		83.10%	(0.0108)	All farmers
B. Maize Production indicators							
Reporting very satisfied with maize training (%ge)		73.36%	(0.0392)		73.90%	(0.0280)	Maize farmers
Main occupation in agriculture/ poultry farming (%ge)		65.98% ***	(0.0210)		60.30%	(0.0147)	Maize farmers
Agronomic technique score		4.4598	(0.0862)		4.396	(0.0576)	Maize farmers
ever visited a demonstration farm (%ge)		61.4% ***	(0.0439)		49.00%	(0.0313)	Maize farmers
number of times weeded plot		2.10751	(0.0295)		2.117	(0.0212)	Maize farmers
perceptions towards free seed (On a scale of 0-5)		3.192	(0.0682)		3.297	(0.0493)	Maize farmers
perceptions towards purchased seed (On a scale of 0-5)		3.5847	(0.0502)		3.603	(0.0361)	Maize farmers
purchased seeds in the last season (%ge)		73.47%	(0.0265)		69.20%	(0.0191)	Maize farmers
Used fertilizer (%ge)		33.45%	(0.0280)		36.70%	(0.0202)	Maize farmers
Used manure/ compost (%ge)		17.7% **	(0.0210)		12.40%	(0.0152)	Maize farmers
Spent on pesticide/ herbicide/ fungicide (%ge)		16.36%	(0.0214)		14.90%	(0.0154)	Maize farmers
Spent on machinery/ equipment (%ge)		18.50%	(0.0222)		15.60%	(0.0160)	Maize farmers
Spent on harvesting/ processing in the last season (%ge)		10.39%	(0.0180)		10.40%	(0.0130)	Maize farmers
Spent on hiring labour in the last season (%ge)		14.72%	(0.0210)		15.10%	(0.0151)	Maize farmers
Reporting HH head controls land resources (%ge)		33.00% ***	(0.0214)		40.70%	(0.0150)	Maize farmers
quantity maize produced (in Kgs)		720	(62.23)		651.8	(44.97)	Maize farmers
quantity maize sold (in Kgs)		198.89	(35.09)		185.3	(25.32)	Maize farmers
C. Poultry Production indicators							
Reporting very satisfied with poultry training (%ge)		74.64% *	(0.0451)		67.00%	(0.0301)	Poultry farmers
used foot bath (%ge)		7.19%	(0.0189)		8.19%	(0.0126)	Poultry farmers
vaccinated poultry (%ge)		66.29%	(0.0335)		65.70%	(0.0223)	Poultry farmers
Reporting HH head alone decides how the poultry income is spent (%ge)		30.4% ***	(0.0284)		14.20%	(0.0189)	Poultry farmers
Reporting male determines returns from poultry (%ge)		22.7% ***	(0.0431)		34.70%	(0.0287)	Poultry farmers
Poultry knowledge score (On scale of0-5)		3.649	(0.167)		3.383	(0.112)	Poultry farmers
Current stock of poultry birds (Mean)		21.1	(1.498)		19.59	(1.001)	Poultry farmers
Total poultry production (Mean)		30.42	(1.808)		27.96	(1.203)	Poultry farmers
Number of birds died in last 3 months		6.012***	(0.699)		8.116	(0.465)	Poultry farmers
used poultry inputs (%ge)		69.58%	(0.0316)		74.30%	(0.0211)	Poultry farmers
used mixed feed (%ge)		51.35%	(0.0353)		52.40%	(0.0235)	Poultry farmers
kept birds in a coop (%ge)		57.74%	(0.0347)		60.40%	(0.0231)	Poultry farmers
used modern drinkers/ feeders (%ge)		30.70%	(0.0322)		28.80%	(0.0215)	Poultry farmers
controlled ventilation (%ge)		32.84%	(0.0330)		31.60%	(0.0220)	Poultry farmers
encountered quality issues (%ge)		34.11%	(0.0398)		35.70%	(0.0261)	Poultry farmers
reported low quality inputs as the biggest issue (%ge)		80.20%	(0.0590)		75.80%	(0.0382)	Poultry farmers
currently owns local chicken in last 3 months (%ge)		94.45%	(0.0165)		94.00%	(0.0110)	Poultry farmers
sold chicken (%ge)		48.56%	(0.0359)		49.20%	(0.0238)	Poultry farmers
Reported selling poultry through contract agreement (%ge)		5.33%	(0.0270)		9.22%	(0.0179)	Poultry farmers
Reporting they had to look for market for poultry (%ge)		41.46%	(0.0508)		42.90%	(0.0336)	Poultry farmers
Reported selling eggs through contract agreement (%ge)		0.0% *	(0.0351)		6.45%	(0.0234)	Poultry farmers
Reporting they had to look for market for eggs (%ge)		30.02%	(0.0901)		35.50%	(0.0602)	Poultry farmers
participated in any LEAD activites (%ge)		88.65% **	(0.0165)		92.30%	(0.0116)	Poultry farmers
Perception of quality of feed used (On scale of 0-5)		3.5394	(0.0506)		3.592	(0.0331)	Poultry farmers
D. Household food security & Welfare							
ever belonged to a farmers group (%ge)		54.22%	(0.0217)		53.50%	(0.0152)	All farmers
ever taken out a loan (%ge)		17.5% **	(0.0173)		21.60%	(0.0121)	All farmers
value of loan		621,329	(94,972)		587,966	(62,623)	All farmers
ever borrowed money for food expenditure (%ge)		5.94% **	(0.0113)		8.41%	(0.00786)	All farmers
Farmers reporting below average wealth compared to other community members (%ge)		26.03%	(0.0188)		23.60%	(0.0131)	All farmers
Reporting insufficient access to food in last 4 weeks (%ge)		25.17% ***	(0.0198)		33.50%	(0.0138)	All farmers
Amount of money saved for future (In Tsh)		162,835*	(14,399)		137,659	(10,051)	All farmers
Saved at least 10,000 Tsh in last 6 months (%ge)		63.98% **	(0.0212)		59.80%	(0.0148)	All farmers
Food security score (1-27) *lower scores represent better food security		3.678**	(0.220)		4.198	(0.154)	All farmers

Notes: This table is based on the results of an OLS regression testing for mean difference between baseline and midline. Column (1) describes the variable used in each row. Columns (2) and (4) provide the mean of the relevant variable for the midline and baseline respectively. Columns (3) and (5) provide the standard deviation for the relevant variable midline and baseline respectively while Column (6) describes the population for which the analysis was done.
SIgnificance level are denoted by * p<0.1 , ** <p<0.05 , *** p<0.01

Table 8: Mulitivariate OLS regression on log of Number of birds owned showing General Associations

	(1)	(2)
Used poultry Inputs	0.366***	0.339***
	-0.0555	-0.0814
Household food security score	-0.0243***	-0.0194**
	-0.00477	-0.00822
Took out a loan	0.121*	0.153*
	-0.065	-0.0912
Participated in program		0.317**
		-0.135
_cons	2.676***	2.394***
	-0.0332	-0.139
N	1624	502
adj. R-sq	0.05	0.055

Standard errors in parentheses * p<0.1, ** p<0.05, *** p<0.01

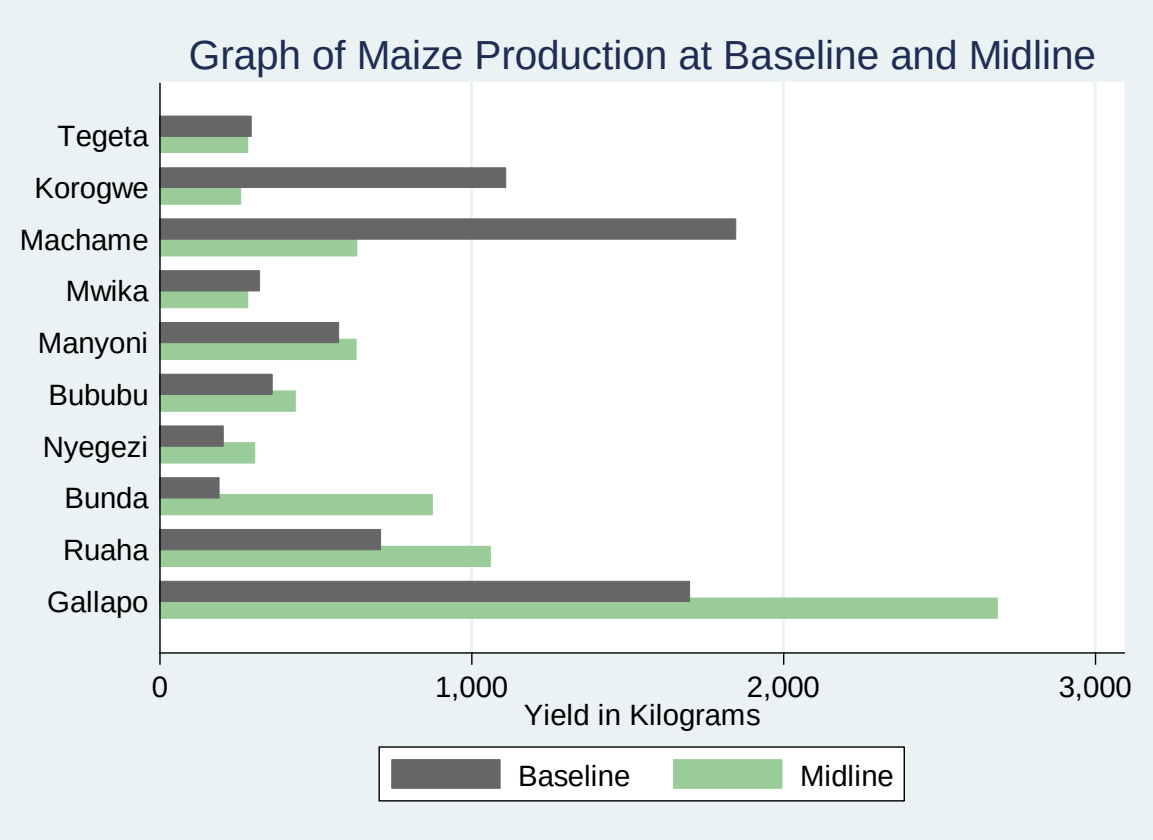
Graph of Maize Production at Baseline and Midline
Tegeta
Korogwe
Machame
Mwika
Manyoni
Bububu
Nyegezi
Bunda
Ruaha
Gallapo
0
1,000
2,000
3,000
Yield in Kilograms
Baseline
Midline

Table 9: Mulitivariate OLS regression on log of production yield of maize showing General Associations

	(1)	(2)	(3)
Used fertilizer (1=Yes, 0=No)	0.462***	0.457***	0.138
	-0.0641	-0.0643	-0.101
Took out a loan (1=Yes, 0=No)	0.167*	0.166*	0.373
	-0.0997	-0.0997	-0.279
Both HHH and spouse involved in agricultural decisions	0.461***	0.463***	0.198**
	-0.0625	-0.0625	-0.0956
Land used for agriculture (Acres)	0.234***	0.233***	0.208***
	-0.018	-0.018	-0.0254
Reporting above average HH conditions (1=Yes, 0=No)		0.16	0.446*
		-0.144	-0.26
Practiced weeding (1=Yes, 0=No)			1.398***
			-0.262
Used fixed spacing during planting (1=Yes, 0=No)			-0.768***
			-0.102
_cons	5.376***	5.370***	5.730***
	-0.065	-0.0651	-0.343
N	1607	1607	814
adj. R-sq	0.142	0.142	0.19

Standard errors in parentheses * p<0.1 ** p<0.05 *** p<0.01

Appendix 6: Household survey data quality review

Review for the Data Set and Midline Report for the Livelihood Enhancement through Agricultural Development (LEAD) Project

1.0 Comments on the Data Set

Generally the quality of the data set is good. However, there are some minor problems with the variable labels which made the data set a bit difficult to understand without making reference to the questionnaire. Further, there are a few missing observations for the variables branch and village. These were difficult to understand, especially for cases for which there were some entries for the subsequent variables. Examples of observations for which the problem was observed are those with the following serial numbers: 408, 410, 411, 425, 426 and 440.

Further, since as indicated in the transmittal letter, the data set which has been submitted for review is somewhat incomplete as it includes only “important variables”, it is not possible to make a definitive conclusion on the quality of the entire/complete data set. However, looking at the data which have been submitted, and the fact that we at Sokoine University of Agriculture had the opportunity to participate in the data collection process, I am confident that the data for the variables which have not been included in the data set which has been submitted for review will be as good as those which have been reviewed. Though the data looks good, in the future, we may wish to allow more time for data processing and analysis in order to minimize the errors which have been observed in the reviewed data set and ensure that quality check covers the entire data set.

2.0 Comments on the Executive Summary

The executive summary has described clearly the main message *i.e.* the Livelihood Enhancement through Agricultural Development (LEAD) project has had a significant impact on the uptake of better crop and poultry management techniques among maize and poultry farmers. It also shows clearly that the intervention has led to an increase in the use of agricultural inputs and hence increasing maize production among intervention farmers.

Notwithstanding the fact that the message has been presented clearly in the executive summary, it can still be improved by providing more details on the intervention and the key impacts. For instance, showing the project areas/locations and the number of households involved can help the reader to get a clear picture of the intervention for which results about the achievement at the midline level are being provided. Further, although showing that the project has had significant impact on the adoption of better crop and poultry management techniques is fine, but it would have been much better if the summary named some of the technologies and management practices which have been adopted by the treatment farmers/households. Also there is a need to show the extent by which the use of improved crop and poultry management techniques have increased. The argument that farmers in the country fail to produce optimally because of lack of land needs to be supported by empirical evidence as the country has a substantial amount of arable land. In improving this section, the target should be to ensure that it is as detailed as the conclusions and recommendations section.

3.0 Comments on the Introduction

The introduction section is fairly detailed and well written. However, it can be improved further by, amongst other things, numbering the various sections and subsections. This needs to be done not only in this section but also other sections in order to facilitate cross-referencing. It is also important to indicate in the very beginning of this section when the

project started. Also the authors may wish to check whether the use of the word will is appropriate at this stage of the project. There are several instances in this section where the use of this word (will) can possibly imply that there are several activities which will be undertaken in future while in reality some of them have already been undertaken and this report is meant to assess their impacts on the target communities/households/farmers. Notwithstanding these minor issues which can be easily rectified, the section has been written very well.

4.0 Comments on the Research Design and Methodology

Generally the research has been designed properly. The use of the Randomized Control Trial (RCT) to estimate the impacts of the intervention (LEAD) is very appropriate as the random allocation of farmers to either a treatment or a control group, enables the researcher to ensure that the two groups are balanced on observable characteristics and therefore assume balance on unobservable characteristics as well. Further the evaluation questions which the present study intended to answer are very pertinent and there is no doubt that they have enabled the researchers to attribute the observed impacts on the beneficiaries to the project.

The selection of the study subjects was done properly as they were selected in a manner that ensured the sample was representative of the population in the areas where the project operates as well as to capture any inter geographical variations. Further, the sample size was estimated properly as it was based on a generally accepted power which is 80%.

With regards to data analysis, the study has made use of one of the widely used approached in impact assessment studies *i.e.* difference-in-difference analysis (DID). This approach takes into account both the effects of the interventions and time and therefore takes care of the effects of the changes (which are not necessarily attributed to the intervention whose impact is being estimated) that are happening in each of the groups. By doing so it ensures that the differences observed between the treatment and control group can plausibly be attributed to the intervention whose impact is being assessed.

5.0 Comments of the Results and Discussion

The results have been discussed properly. However, there is a small problem here as the results have been presented in the annexes so it makes it difficult for the reader to follow easily what is being discussed. It requires the reader to commute frequently between these sections in order to get a clear picture of what is being discussed. It would have been much better if the results and discussion were presented together. I understand that there might be some challenges presenting large tables within the text but the authors may wish to explore the possibility of breaking such tables in smaller ones basing on the message they want to get across in a given section or sub-section.

Also the authors should avoid describing methods in this section. For instance a statement like "……*a DID effect of X% means that the outcome in treatment group increased by X% relative to the changes in the control group from baseline to midline. If there was an increase in one group and a decrease in another group for example, the DID estimate would adjust for this….."* belongs to the methods section, not the results and discussion section. In this section, I expected to see the actual results from the DID computations being presented and discussed, not *X* or *Y*.

In the demographic characteristics section, the authors may wish to check whether the numbers presented are correct as it seems that the ratio of treatment to control farmers *i.e.*1:1.68 has not been computed from the percentages which have been reported in the text which are 68% and 32% respectively. Further, reporting that there was no difference in age between the control and treatment groups may not be very appropriate as there was a difference of 2 years. The authors may wish to argue that the difference was not significant in statistical and/or practical terms.

In reporting the estimated impacts of the intervention, whenever possible the authors should endeavor to use numbers showing the magnitudes of the changes and/or differences between the treatment and control groups. For instance, there is a sentence in which they argue that a *larger* proportion of treatment farmers used line spacing which is one of the agronomic practices taught to the farmers. Instead of just writing large, they would have also provided a figure showing the proportion of the treatment farmers using line spacing. Similarly, in a statement where they argue that the LEAD farmers in addition to using fixed spacing also reduced the number of seeds used per hole during planting, in this case it would have been much better if they gave an indication of the extent by which the number of seeds planted per hole has decreased e.g. the number decreased from an average of *x* before the intervention to *y* after the intervention.

6.0 Comments of the Conclusions and Recommendations

This section is very detailed and well written. The authors may wish to improve the Executive Summary to ensure that it is as detailed as the conclusions and recommendations section.

7.0 Overall Assessment

Generally the data set is of acceptable quality and the Midline Report for the Livelihood Enhancement through Agricultural Development (LEAD) Project is very informative and well written.

Appendix 7: Data sources and evaluation questions

	Evaluation question	Data sources				
		Document Review	Household Survey	Focus Groups	Key Informant Interviews	Synthesis
1.1	Is the LEAD programme relevant to target households? How do we know this? Who is most likely to benefit from the LEAD programme – how and why? Specifically, how (if at all) does the programme ensure that women and girls benefit?					
1.2	How does the programme fit within the wider framework of policies and other programmes which have similar aims?					
2.1	To what extent and how have LEAD farmers experienced changes to the use of inputs and new technologies? What impacts have these had? Who is most likely to have experienced the impacts?					
2.2	To what extent has farmer adoption of improved practices led to increased yields and quality of produce? What evidence is there that adoption of improved practices can be attributed to the LEAD programme?					
2.3	Is there any evidence that increased access to markets is resulting in increased income from maize or poultry? What factors facilitate or constrain the increase?					
2.4	What evidence is there of potential impacts of the use of agrifinance loans? What are the contextual factors that influence how the loans are used and the impacts felt as a result of that use?					
3.1	To what extent, for whom and how have efforts to increase linkages between producers and traders resulted in increased access to different types of markets? How do any new linkages between farmers and traders work within this context?					
3.2	To what extent have proposals to create linkages with private sector partners been successful? What evidence is there of these linkages?					
3.3	To what extent and how has farmer training improved farmer knowledge and led to adoption of improved practices and technologies?					
3.4	Who is most likely to use the loans system? How are they using it? What are the enablers/constrainers to using the loans?					
3.5	How does training for agrovets, agrodealers and traders influence interactions with farmers?					

	Evaluation question	Data sources				Synthesis
		Document Review	Household Survey	Focus Groups	Key Informant Interviews	
4.1	Do the ways in which the programme supports linkages between producers and traders represent the most efficient approach to delivery? Do the delivery mechanisms used place the programme in the role of a facilitator or service provider?					
4.2	Are the gaps identified in the value chain being addressed by the approach to facilitating investment in targeted areas? What evidence is there of outcomes from investments made by the investment funds? What is hindering or helping it to happen?					
4.3	How has the organisational structure supported or hindered the efficient delivery of the programme? How do the different layers of the organisation communicate with each other? What are the outcomes of this communication? Where are the bottlenecks? What are the facilitators?					
4.4	Does LEAD have effective systems and criteria to ensure VFM in planning, delivery and project management? - how could these be improved (if at all)? - what evidence is there that VFM in terms of delivery is being maximised?					
5.1	How has programme learning and adaptation been facilitated or constrained by programme and governance arrangements? How has the wider organisational (BRAC) governance system impacted on programme adaptation?					
6.1	What evidence is there that the programme is resulting in sustainable change in the relationships between producers and buyers? What factors are making that change happen or what constraints are stopping it from happening?					
6.2	What evidence is there of replication of learnt approaches amongst farmers, agrodealers and agro-vets and traders?					
6.3	What evidence is there of sustainable outcomes of the facilitation workshops? To what extent is this approach welcomed by stakeholders?					
6.4	What evidence is there of dynamics within farmers groups that will ensure sustainability? What are these? How do they work?					

	Evaluation question	Data sources				Synthesis
		Document Review	Household Survey	Focus Groups	Key Informant Interviews	
7.1	(Monitoring) Is the monitoring system enabling staff to be suitably reactive?					
7.2	(Monitoring) Are M&E systems working and robust – are they likely to provide appropriate information for the final evaluation?					
7.3	(Social and poverty focus): What evidence is there that the programme is reaching the most marginalised farmers? What elements of the programme are ensuring that the most marginalised farmers are finding new relationships within the market system?					
7.4	(Gender) To what extent is the programme demonstrating an understanding of the different factors that influence how men and women interact with markets? What are those factors?					
8.1	(Synergies with other interventions) Has LEAD interacted with other similar programmes in Tanzania, or learnt from other programmes elsewhere, and if so how has this improved programme delivery or results? Are other programmes learning from LEAD? What examples are there?					

Appendix 8: List of KII respondent institutions

BRAC management

LEAD Programme management

LEAD programme staff

FoodTrade East and Southern Africa (DFID Challenge Fund):

World Food Programme (Patient Procurement Platform)

Pee Pee Tanzania Ltd.

Africa Enterprise Challenge Fund (AECF)

East Africa Grain Council (EAGC)

Techfortrade East Africa

AgriProFocus Tanzania

Heifer International