



Livingstone Tanzania Trust

Smallholder Farmer Training Programme: Managhat Community



Progress Report 2016-7

Report by Livingstone Tanzania Trust
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Executive Summary

Livingstone Tanzania Trust's (LTT) Agricultural Programme is one of a portfolio of projects LTT are delivering in Babati Tanzania. Building on existing knowledge within the community we deliver training and small loans to enable farmers and householders to improve and diversify their skills, increase their production levels, improve their incomes and gain greater income security as a result so that they are better able to improve their lives for themselves.

Our Smallholder Farming Programme has developed from a pilot programme in the Managhat community with 25 farmers to being scaled up within the community and scaled out into other communities and LTT are grateful for the support and advice that our donors have offered us during this process. 50 farmers joined the programme in Managhat in 2015 and have successfully completed their training and a further cohort of 50 farmers joined the programme in October 2016. As a result, we are now directly benefiting 125 farmers in Managhat and we aim to expand out to reach a further 100 farmers in the next two years. This report focuses mostly on Groups A & B and their post training implementation.

Collectively farmers in the programme continue to increase their profits which is a significant achievement. 68% of the farmers in Group A (the 1st group of 25 farmers) increased their profit levels in the last year whilst Group B (the 50 who joined in 2015) have completed their first full cycle of the programme generating a collective profit of Tsh 41,880,450, with 95% of farmers in this group making a profit which is very encouraging.

	Profit 2014	Profit 2015	Profit 2016
Group A	Tsh 33,401,700	Tsh 39,611,295	Tsh 42,650,800
Group B			Tsh 41,880,450

Being subsistence farmers the first priority of farmers in the programme is to provide for their families, where possible they then sell their surplus. Our training on vegetables, diet and nutrition is resulting in farmers growing vegetables for the family but not all grow sufficient for retail. We record this as a loss due to zero income set against the cost of seeds and pest control, suggesting a negative outcome but in reality, it is a positive thing. Awareness and skills on nutrition and vegetable farming has created the desire to grow vegetables which the family can then eat for improved health whilst saving the household from having to spend their money on vegetables in the market. Ultimately we aim to enable farmers, where possible, to generate an income from these activities as well through selling surplus produce but it may not be possible for all and we take it as a significant positive result that more farmers appear to be engaging to small scale vegetable production for the household.

We recognised the need to grow and develop our LTT team and our local partner the Manyara Community Development Organisation to ensure we can continue to successfully deliver our programmes in Babati. We have expanded our team both in Tanzania and the UK. Sophie Wotton has joined the LTT team, overseeing the community programmes and offering support as LTT grows as an organisation. In Tanzania, the 4 young men who were sponsored to attend the Agricultural Institute in Dareda have now completed their studies and joined MCDO full time, an essential resource to enabling us to expand the farmer training programme and Robsone Benedicto has joined MCDO as Agricultural Officer, taking responsibility for the local management, development and delivery of both the farmer training and edible gardens projects and supporting our agricultural work with schools. He replaced the Community Development Officer who left MCDO

In addition to our human resources we have also invested in technological solutions to address the increasing amount of data we are collecting, processing and analysing. To this end we have established a partnership with 'Datawinners', a mobile data collection service which is already speeding up both the collection of data and the speed of analysis. This will be refined over the coming year and will allow us to get

feedback to farmers in near real time and we hope to fully utilise this system for next year's analysis and reporting.

This report reviews the progress of the programme in Managhat and looks at the agricultural activities of the farmers over the last year, highlighting some significant successes as well as a number of opportunities for improvements. In order to comply with data protection law, individual farmers within this report have been anonymised.



Farmers ploughing the land

Overall the program is being extremely well received. It is great to see farmers enthused about the programme and humbling to talk with those who feel they have benefited in a way that allows them to make improvements in their own lives, in line with their own priorities.



1. Background Information

Livingstone Tanzania Trust (LTT) is a community development charity working in Babati in northern Tanzania through local partners on grassroots enterprise and education projects. We believe that the poorest and most vulnerable have the potential within them to build lives that open new opportunities and enable them to meet and exceed their basic needs and improve their quality of life. Centred on respect, trust and longevity we build long term partnerships with the communities we work with, enabling us to collaboratively develop programmes, overcome short term hurdles and ultimately unlock the potential within everyone. Together, we build the foundations of sustainable development; unleashing the power of enterprise, supporting farmers to farm their way out of poverty, improving educational capacity in schools and ultimately enabling communities to break the cycle of poverty for themselves.

To deliver our programs in Tanzania LTT works in partnership with a local organisation, the Manyara Community Development Organisation (MCDO), which is made up of local community members.

LTT's Smallholder Farmer Training Programme

Our Smallholder Farmer Training Programme aims to enhance the knowledge and skills of small scale farmers in the Manyara region of northern Tanzania to improve their productivity, incomes and income security. The programme aims to ensure that farmers can live and work with dignity, feed and provide for their families, produce food for their locally community and take advantage of the market opportunities provided by the growing town.

The project intends to provide agricultural training and access to microloans for 225 smallholder farmers in the Managhat community over 5 years and aims to assist them to achieve:

- Improved yields following training in animal husbandry, fruit and vegetable growing and staple crops
- Improved record keeping
- Improved household income security
- Greater food security and improved nutrition, by growing and consuming a wider variety of foods, particularly vegetables and by participating in health awareness training
- Improved communication and collaboration between farmers enhancing the spread of knowledge through the wider community
- Open access to an ongoing training resource for the benefit of the wider community
- Improved animal husbandry

The training is delivered by MCDO using a combination of demonstration, theory and practical workshops at the Managhat School market garden and on the farmers' communally owned land. The programme will train a new intake of 50 farmers each year and includes a series of individual home visits and on-site bespoke support and advice from the MCDO Agricultural Team.

Each intake of farmers is supported to establish their own Community Based Organisation (CBO) providing a forum for peer learning and support and creating the basics for collaborative working. Microloans are offered to each CBO to enable farmers, many of whom lack access to capital, to make small investments in and grow their farming business – there is a saving scheme associated with the loan aimed at providing sustainability. This CBO then supports the training for the next group, as ambassadors and peer mentors. In this way, the knowledge is kept alive and passed on within the community organically.



2. Progress of the programme in 2016-2017

In 2016 a second group of farmers (Group B) completed their training and a further 50 farmers (Group C) joined the programme in October. This brings us to a total of 125 farmers in the Managhat community being reached through the programme and with the support of our donor we hope to expand the programme to a further 100 farmers over the next two years.

2.1 MCDO's Agricultural Team – Welcome sponsored students back as staff

John Martin was selected by the Managhat community to attend BACHO Agricultural Institute in Dareda. In November 2016, he successfully completed his course in Livestock and Agriculture for Livestock Management and in December John along with 3 other sponsored students, joined MCDO full time as Community Agricultural Support Officers (CASOs). They spent their first few months shadowing the team to understand all of MCDO's work and undertook additional in-house training with Mr. Marceli, focussing on vegetable production and organic agriculture. With the CASOs in place and with additional funding we have been able to scale up the farmer training programme in 2017 to 2 additional communities: Waangwaray and Malangi, and to expand our Edible Gardens Project into more communities.

The benefits of John returning to his community are already being felt with community members going to him for advice and treatment of their livestock, a valuable service when vets are often unavailable and their services expensive. John's advice is free to community members but any medication is charged back to the individual. John is an invaluable resource for the training programme and his extensive local knowledge means he can provide poignant and highly relevant advice. As he is based full time in Managhat he can also visit each individual farmer on their own farms, providing bespoke support and mentorship as farmers embark on new ventures and try new techniques. The initial feedback from the community has been extremely positive and we are sure that as John continues to develop in his new role he will bring even greater benefits to the farmers of his community.

In addition to the CASOs, MCDO has also recruited a dedicated Agricultural Programme Co-ordinator, Robsone Benedicto, to oversee and drive forward our agricultural work in Babati. Robsone joined in January 2017 to replace the departed Community Development Officer. His extensive knowledge and experience working with farming groups in Tanzania is proving invaluable and he has already helped to improve the programme's management and delivery. He is critical to developing the programme in the coming years and to oversee its successful expansion into new communities as well as providing management and mentorship to the CASOs. The agricultural team will continue to benefit from the advice and work of Mr. Marceli who works in an advisory position as he begins to approach retirement.

2.2 Developments at the Managhat Primary School to support agricultural training

Last year we considered setting up a centre for livestock in the Managhat community. However, working with the farmers and the school we decided to focus our efforts instead on enhancing and developing the Managhat Primary School's farm so that it could become a centre for livestock as well as market gardening and be used for training whilst simultaneously supporting the school's income generation activities. The MCDO agricultural team have worked together with the school to improve the health and care of the cattle and to create a fodder garden so that the school can provide its own food for its cows as well as then being able to provide training and demonstration to farmer's groups on best practices in animal husbandry.

With the support of a volunteer team a chicken shed and enclosure has been constructed at the school to create a poultry business. This can be used as a platform for training the farmers on poultry care and well-being, we hope to secure funding to populate the coup with chickens.

The first steps have also been taken to re-establish a tree nursery at the school. Once fully established this will provide the school and community with a supply of fruit and firewood trees whilst also creating a forum for training the farmers on how to establish a nursery and effectively manage trees.

Last year, noticing how challenging farmers found their lack of accessible, year-round water we decided to explore rainwater harvesting techniques that might be applicable for farmers. On a new school building constructed at Managhat we installed guttering connected to a 5000 litres water tank to demonstrate the potential of collecting rainwater from corrugated iron roofs. A number of farmers for whom this is an option have started to consider investing in something similar. Within the school's market garden a drip-irrigation system has been installed. This simple and affordable system is effective at conserving water and particularly applicable to farmers growing vegetables. Additional training sessions for both Groups A & B took place in early 2017 at the school to see the drip irrigation system in use. At a cost of just Tsh 36,000 per unit this system is within reach of many of the farmers.

2.3 New Project Participants

In October 2016, a further 50 farmers from the Bambai sub-village joined the programme forming Group C. This group live in the hills approximately 4-5km east of the Managhat school and do not have credible access to the Managhat school.

To ensure that we can demonstrate gender equality and open governance, we consulted the community leaders and MCDO and jointly reviewed and amended our selection criteria. We then conducted a baseline survey on those farmers. The group range in age from 22 to 76 and 86% are the head of their household. The entire group is reliant on agriculture for their primary income, predominantly through the sale of crops with some members also relying on the sale of livestock (70%) and the sale of milk/eggs (22%) to provide the household's income. On average, farmers in the group farm an area of 2.5 acres with 58% of the group owning all of their land, 14% owning some and renting some and 28% renting all of the land they farm. Prior to any training all the farmers were planning to grow the staple crops of maize and pigeon peas, with half of the group only planning on growing these two crops. 34% are planning on growing 3 different crops and just 10% are planning on growing 4 different crops, the majority of additional crops being beans, black beans or tomatoes. This is therefore a base line from which we can measure progress.

To support their training the group have established 2 small communally cultivated areas where they can put into practice the ideas from the training. This is proving extremely beneficial both in terms of group dynamics and co-working and in furthering their training.



Group C farmers learning to plant on terraces

2.4 Agricultural Training

Previously farmers have expressed concerns about their ability to implement the theoretical practices of natural pest control they have learnt about. Mindful of the need to demonstrate rather than preach, we put into practice the planting systems at the Managhat school farm which demonstrate how to use plants with a strong odour to deter pests. Then at refresher workshops for Groups A and B we have been able to reinforce the importance and potential of natural pest control. It turns out that there is a growing demand for crops that have not been sprayed with chemicals as a result of increased knowledge and awareness of the potentially negative impacts of high chemical inputs to crop production on both health and the local



ecosystem. It will be interesting to see whether this translates into increased demand for organic produce in the coming years.

Training also reemphasised the importance of running the farm as a business, so we focused on enterprise in agriculture. The session covered record keeping and cash flow management, the importance of diversification, understanding market fluctuations in price and the appropriate storage of crops to enable farmers to wait for higher prices. This session was well received by the groups, with some farmers explaining that this element of the training was invaluable, and, based on the skills they developed, they have begun keeping their own accurate records which means they are more careful about spending money and have more of a sense of how their farm is performing, ultimately helping them to ensure they are operating profitably.

Thanks to the knowledge of the CASOs, training on livestock management and animal husbandry has also been included for the first time, delivered to all groups in the spring of this year. Early feedback has highlighted how important this new module is to the farmers, particularly as some are beginning to expand into animal husbandry.

"I'm very happy for the training we have had in agriculture, because of the training I started planting vegetables at my home and for household consumption, the additional income I've put towards managing the family." – Farmer Group A

2.5 Nutritional Training

Alongside the agricultural training we provided training on basic health, nutrition and sanitation. This improved two-day training was delivered in March 2016 for Group B farmers and in April 2017 for Group C farmers and was extremely well received. The session combined teaching the basics of good sanitation and hygiene and outlined simple measures to prevent diarrhoea, cholera etc.

In addition, this aspect of the farmers' training raises awareness of simple steps to improve the health of the family, especially women and children through nutrition and diet. This can also act as a stimulus, encouraging group members to grow vegetables even if just for family consumption. Prior to joining the programme 26% of group B were eating vegetables just 2x a week or less whilst in the newer group of farmers 72% are eating vegetables just twice a week or less. We will be following up on these consumption patterns in the coming years for both Group B and Group C to explore whether any changes have occurred, as well as looking at the number of farmers growing vegetables to feed the family.

We are currently in the process of developing an improved, bespoke evaluation process for this nutrition module of the training programme so that its impact can be measured more effectively.

2.6 Microloans to smallholders

Access to capital can be a major barrier preventing smallholder farmers from investing in their own farming activities. Without the capital, many farmers would struggle to implement new ideas on their farms. In light of this, LTTs agricultural programme offers finance alongside training. In November 2016, micro loans were issued to 125 farmers in the Managhat community, totalling Tsh32,500,000. Loans range in size from Tsh200,000 to Tsh500,000. The larger loans have only been offered to Group A due to their effective and proactive engagement with the programme. Loans are offered for 3 years alongside intensive training in the first year and ongoing support/mentorship in the 2nd and 3rd years. For Group A, this is expected to be their last round of access to loans, although as mentioned later in this report we would be keen to discuss an extension with our donor in order to support sustainability of financing for the farmers in this group.

2.7 Group Demonstration Land

Groups A & B have worked collaboratively over the year on their piece of land. This land continues to be both a vital training resource and income source for the farmers. In April, the group were hopeful of a significant harvest of beans and maize from the land. Their maize is tall and strong with the majority of plants producing 2 cobs, this is in stark contrast to surrounding land and fields where the maize crops are struggling and stunted. This year with the short rains failing and the long rains arriving later and falling more intensively than usual this additional income has the potential to be extremely important to the farmers in both groups.

The group land will continue to be used by the farmers as part of their cooperative approach to farming which is a useful step to more collaborative production and sale which many are still cautious of. Group C, however, established their own demonstration area because they are 5km from the school. This land is being rented at the groups own volition through money collected from the new group members, demonstrating their commitment to and interest in the project and they are already learning terracing and how to form seed beds and with the support of the MCDO agricultural team have begun harvesting vegetables from this new plot.



Group A leaders inspect their land

3. Success and Key Results from the programme

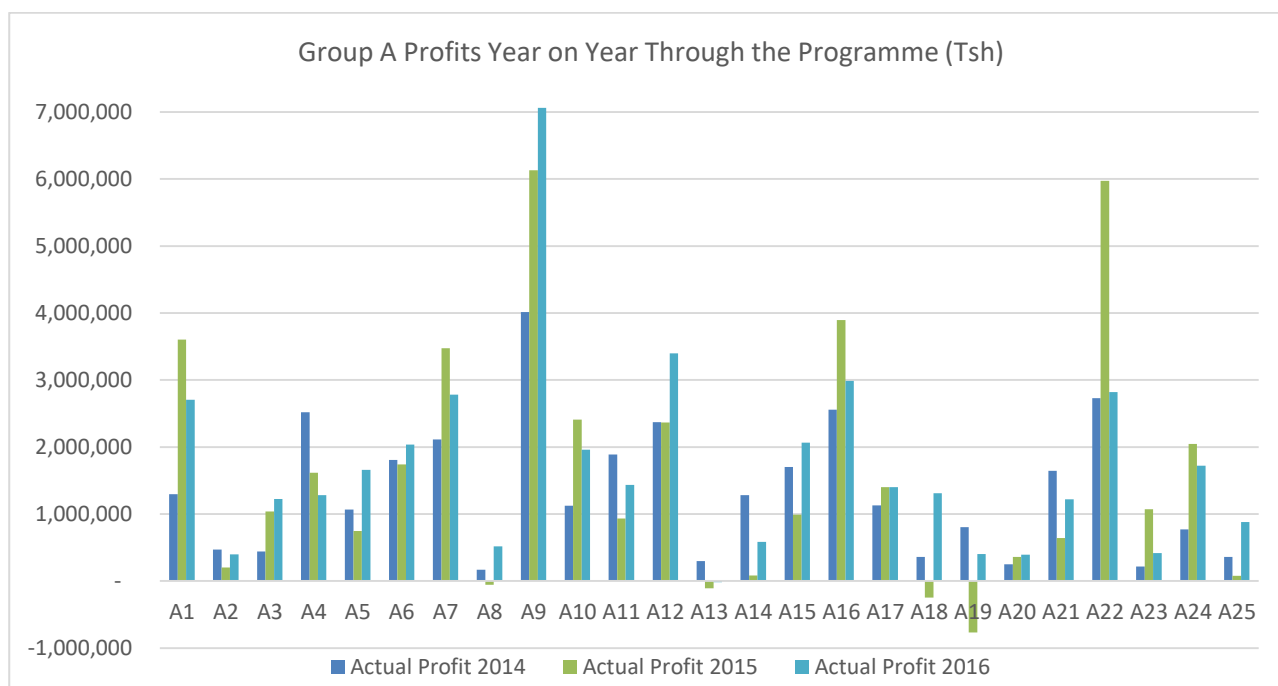
In this section, we review the achievements and experiences of the farmers in Group A and Group B¹ who have all now completed and are implementing their training.

For the purposes of this report we have accounted for the full yield of each farmer on a crop by crop basis, assigning the lowest selling price achieved by members of the respective group to produce that is being held by the household for home consumption or for possible sale at a later date. This unsold yield still has a value and as such has the potential to contribute to the household's income if needed.

Over the last year Group A farmers have collectively increased their overall profits by 8% as can be seen in the chart below. This is a fantastic achievement for the group as whole.

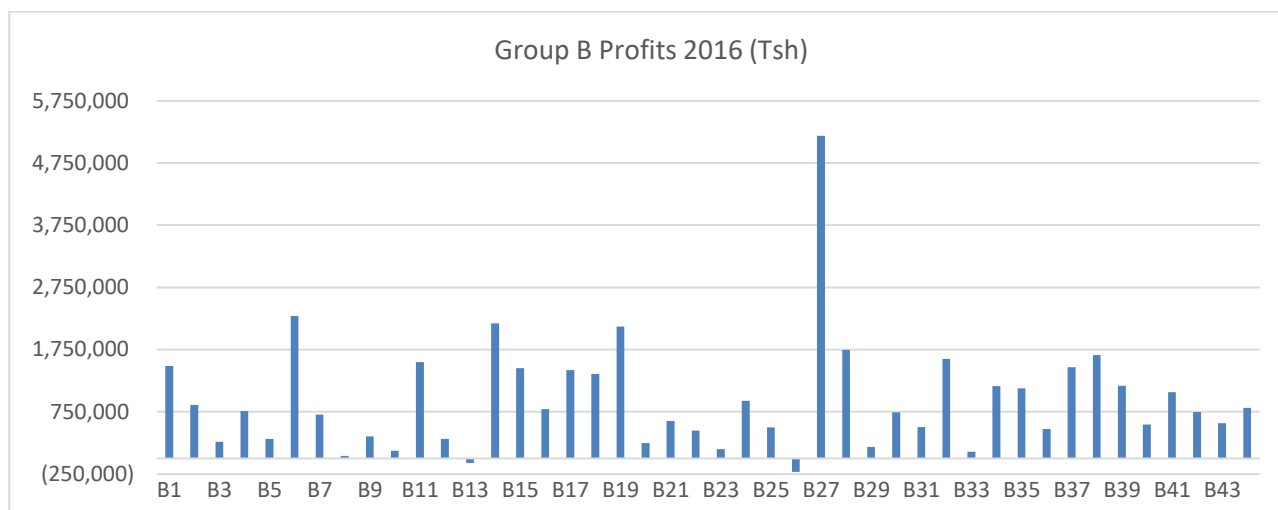
	Profit 2014	Profit 2015	Profit 2016
Group A	Tsh 33,401,700	Tsh 39,611,295	Tsh 42,650,800
Group B			Tsh 41,880,450

The erratic weather continues to be a significant challenge for farmers in Babati. When we look at each individual's progress the improvements have not been equally experienced, 68% of the farmers in Group A have improved their income since last year while 32% have not. Some have made exceptionally large increases in profits on last year, up to a 1031% percentage increase, whilst others have experienced a drop in profit. In addition, a number of the farmers have also evidently recovered significantly from losses the previous year. The graph below illustrates the changes in overall profits of Group A farmers through the programme. As can be seen here there have been significant fluctuations in farmers' profits over the past 3 years, a full table of each individual farmer's profits year on year is available in appendix 1.



In their 1st year of the programme 95% of Group B farmers made a profit from their farming activities, which is extremely encouraging, the pattern of profits is illustrated in the graph below.

¹ In this report figures for group B are expressed as a proportion of 44. The group started with 50 members but 6 were excluded following repayment of the first round of loans in October 2016 and their full agricultural accounts for the year could not be collected.



In the following sections, we examine in greater detail each crop and the experiences of farmers over the course of the year.

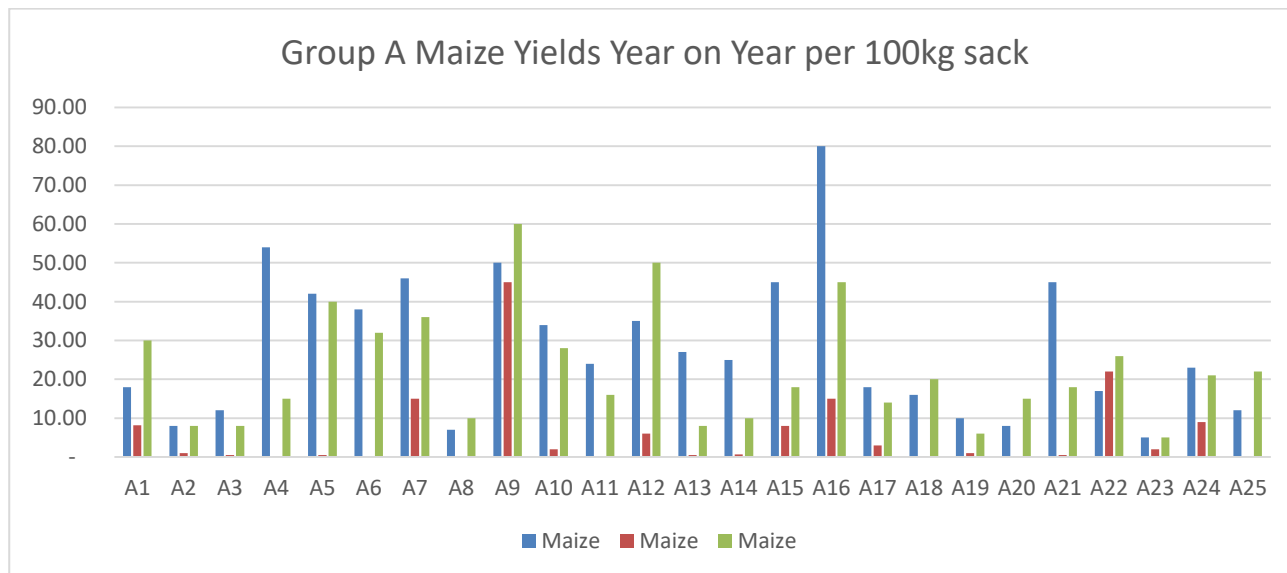
3.1 Staples

Maize and pigeon peas have a symbiotic relationship - the maize takes nutrients from the soil, the peas put them back, for this reason they continue to be grown by the vast majority of smallholder farmers in Babati. Maize can have two seasons, the early maize is harvested in January while the late maize is harvested in June, the pigeon peas are harvested in September. The table below reflects the performance of each group.

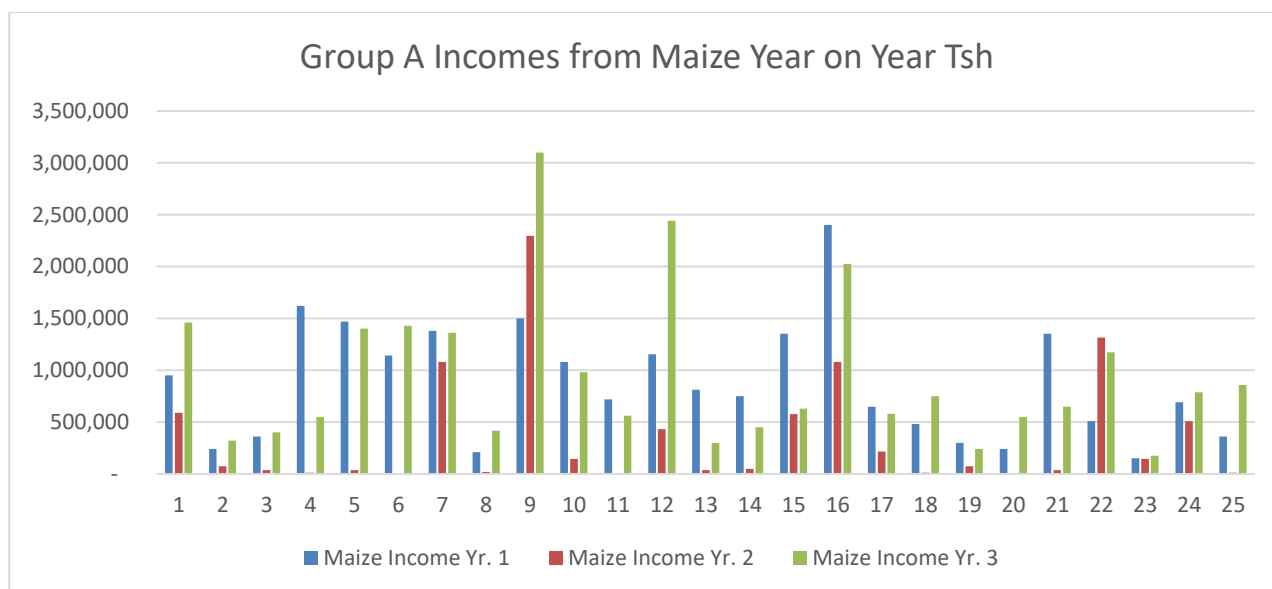
		Actual 2014	Actual 2015	Actual 2016
Maize Yield per 100kg sack	Group A	699	141	561
	Group B			646
Pigeon Pea Yield per 100kg sack	Group A	73	97	153
	Group B			187
Maize Income (Tsh)	Group A	21,863,000	8,775,000	23,578,000
	Group B			24,632,000
Pigeon Pea Income (Tsh)	Group A	8,053,000	24,295,988	16,980,000
	Group B			20,821,000
Total Income (Tsh)	Group A	29,916,000	33,070,998	40,558,000
	Group B			45,453,000
Costs (Tsh)	Group A	9,097,200	10,616,100	12,869,900
	Group B			16,429,300
Gross Profit (Tsh)	Group A	20,818,800	22,454,898	27,688,100
	Group B			29,023,700
Gross Profit (%)	Group A	70%	67%	68%
	Group B			63%



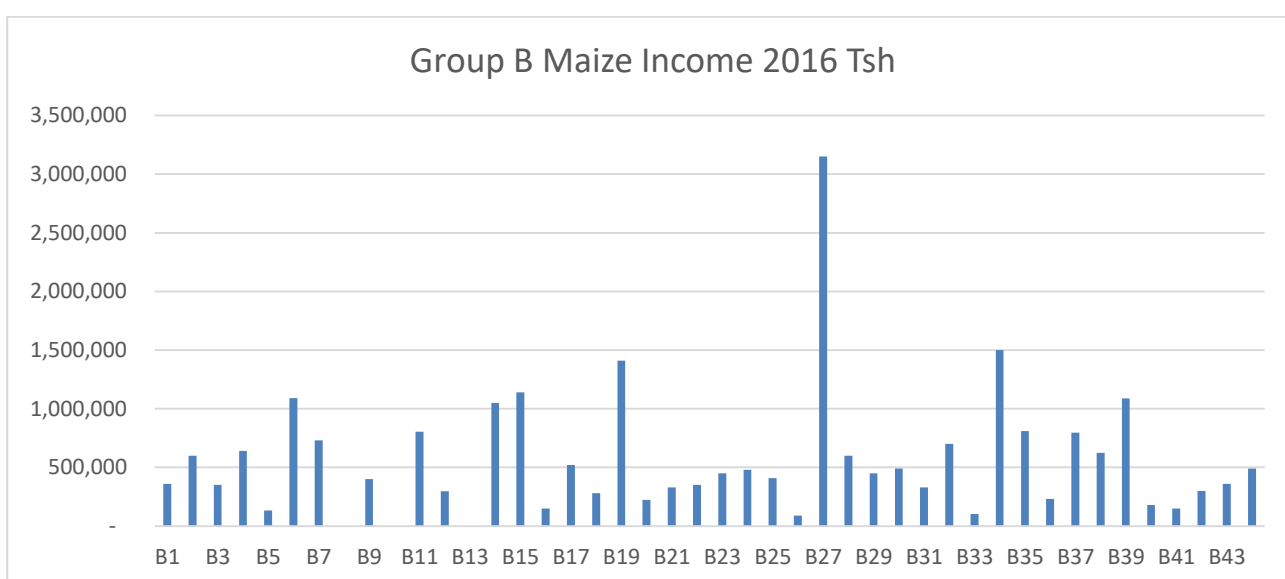
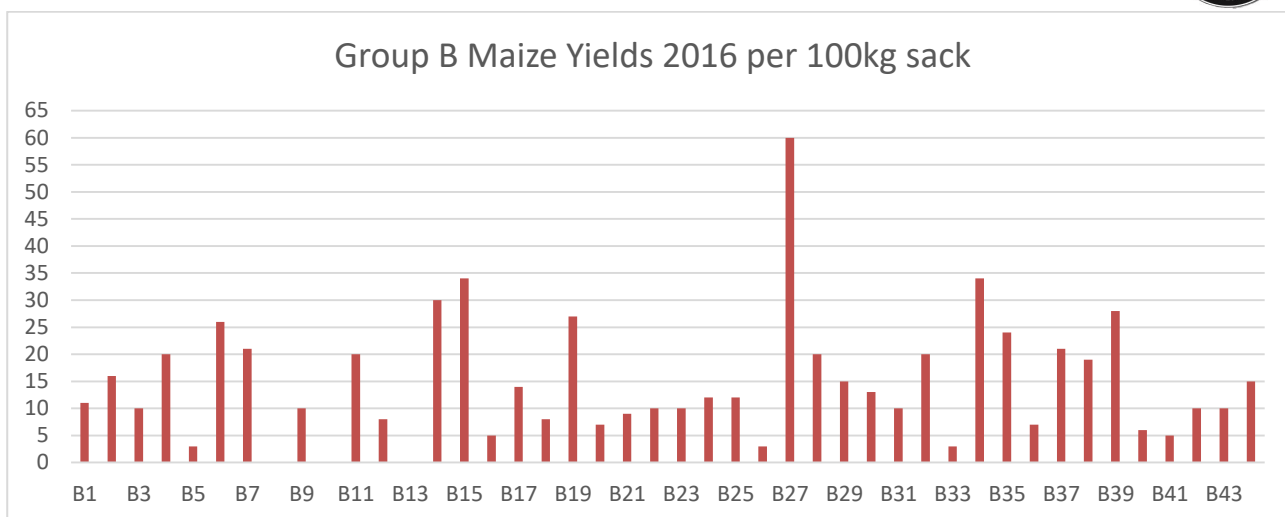
The chart below depicts Group A's maize yields which have returned closer to the 2014 yields and in some cases exceeded them, despite not achieving the same yields the income from maize has increased. In 2014 the average selling price per bag was Tsh31,278, in 2015 it was Tsh62,234 and in 2016 it was Tsh42,028 so a degree of scarcity can be a good thing. Looking at the pigeon pea crop in 2014 the selling average selling price per sack was Tsh110,315, in 2015 Tsh250,474 and in 2016 it has returned back to 110,980.



The graph below illustrates the income generated by group A from these respective yields, depicting the significant recovery from the previous year's poor income.



With regards to Group B, all bar 1 farmer grew maize and 95% (41 of the 43 growing maize) were able to generate a harvest. The graphs below depict the maize yields and incomes for Group B farmers in their first year in the program. As can be seen here there is significant diversity within the yields that farmers are producing which is to be expected as they each farm different sized plots of land.

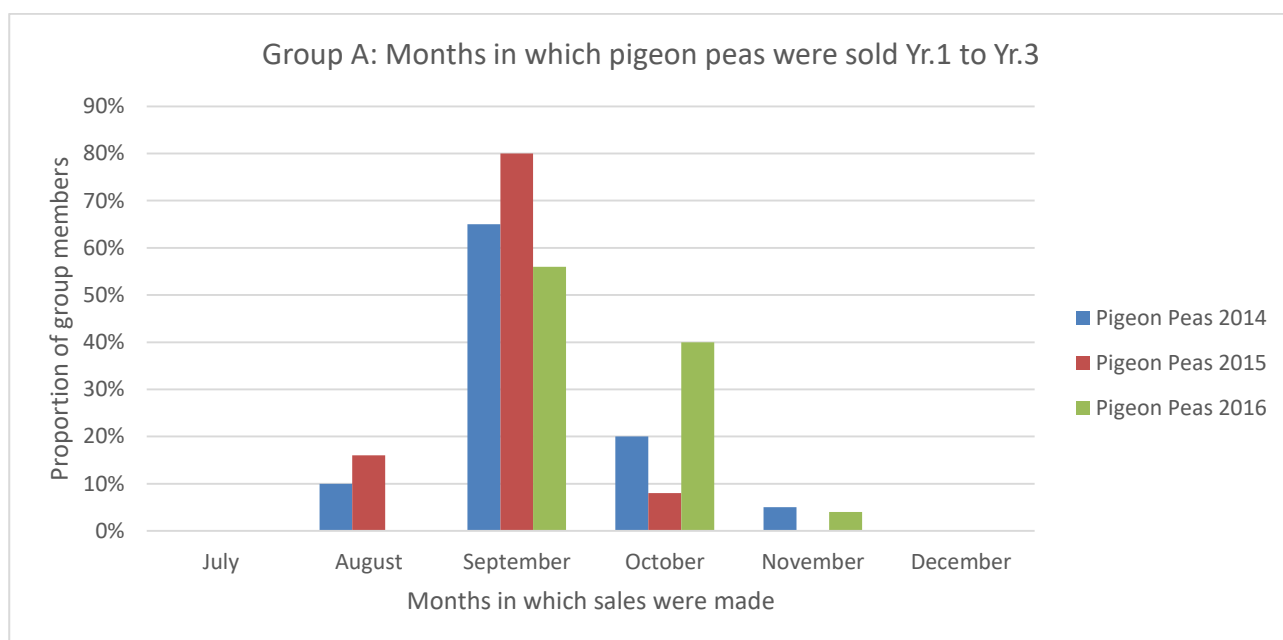
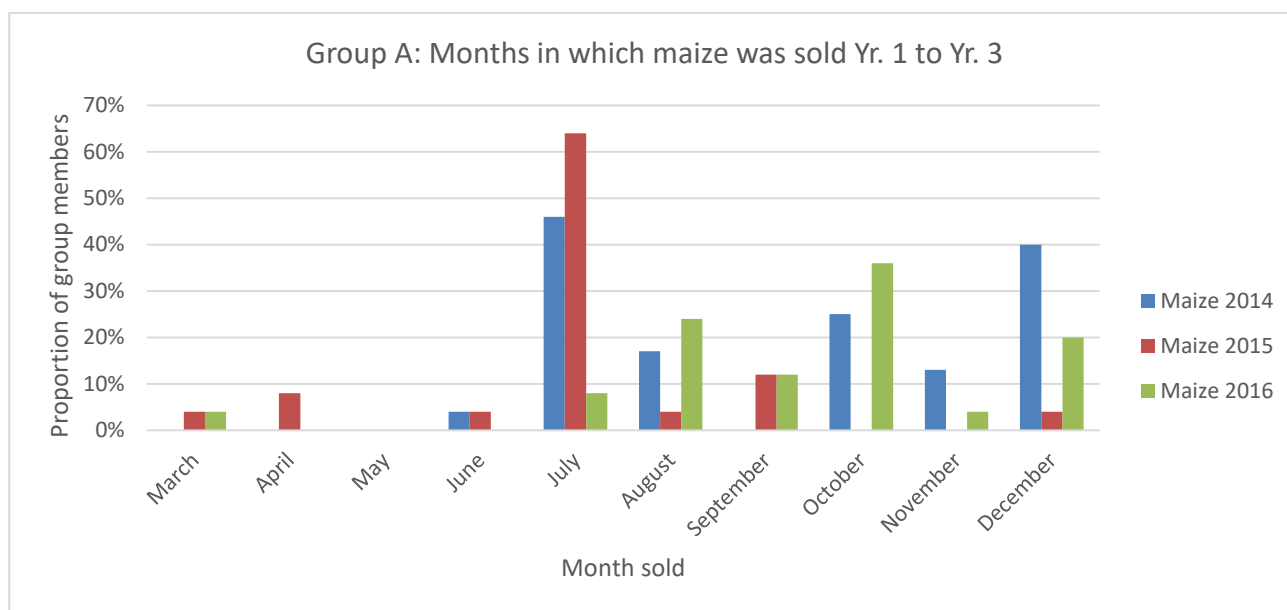


In relation to pigeon peas, Group A farmers’ yields have collectively increased, from 97 bags in 2015 to 153 bags in 2016 with 80% of the farmers increasing their individual yields. The selling price however dropped from the previous year and most farmers were able to sell at between Tsh100,000 and Tsh120,000. Some of the members have established relationships with regular buyers enabling them to negotiate and agree on a reasonable price, without these relationships sales are made where and when possible and often at times of need which may result in having to settle for a lower price.

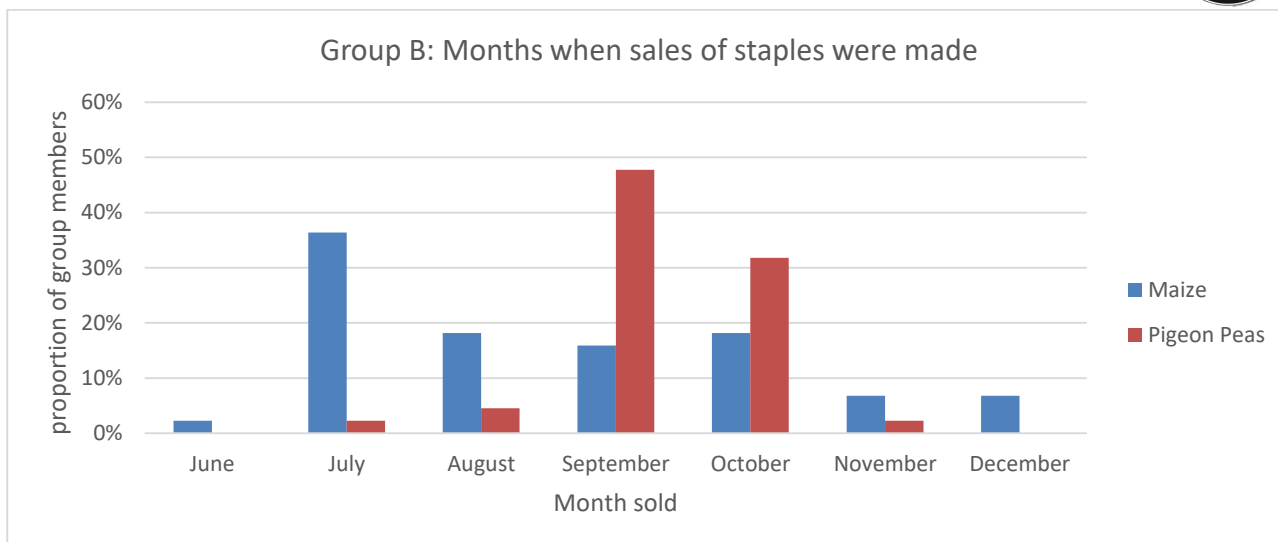
After harvesting their maize, the farmer will keep some back for family consumption and will make the rest available for sale. Farmers in urgent need for money will sell straight away, often getting a poor price, while those who can afford to wait will wait as long as they are able into the dry season when the prices can rise significantly. On the whole, the pigeon peas are sold straight away, but scarcity can easily lead to their price doubling in the following months, again motivation to hold on as long as possible. Being able to hold onto produce suggests improving household resilience and finances and can also provide a measure of progress out of poverty. For the maize, it is interesting to note that in 2016 sales were made from June (immediately following harvesting) all the way through to December with selling prices ranging from Tsh35,000 to Tsh90,000. Notably in Group B some sold maize at an even lower price than Group A members, just Tsh30,000 per bag, which may be due to the lack of established connections with buyers and this needs to be explored further.

68% of Group A and 44% of Group B farmers made sales of staple crops after August/September suggesting that they could afford, through good cash flow, to delay the sale of their harvests and hold out for better prices.

The graph below illustrates the months in which Group A members sold maize followed by a second graph illustrating when sales of pigeon peas were made year on year through the programme. As we can see here in 2016 a significant proportion of the group have been able to hold onto a least some of their maize and pigeon pea harvest to sell at a later date which is extremely encouraging. 2015 was a particularly bad year for maize harvest and the farmers on the whole had to sell early.



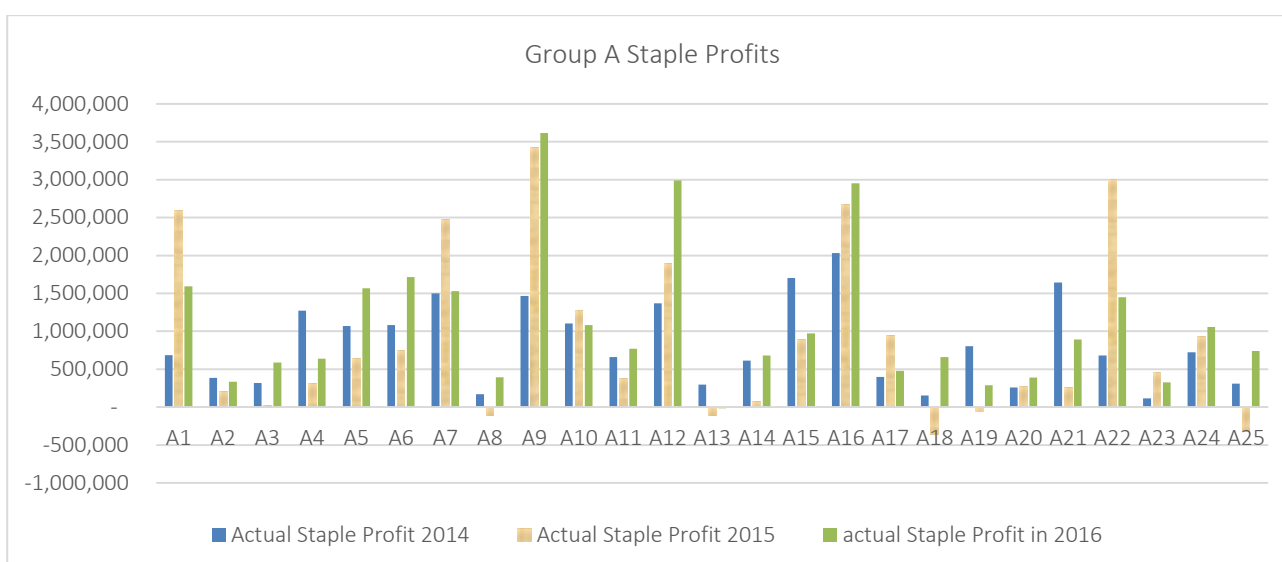
The following graph illustrates the months when sales of staples were made by Group B in their first year and will serve as a useful comparison when we analyse next years' results. What is particularly striking is that although the pigeon pea pattern is extremely similar between the two groups a far larger proportion of Group A are able to makes sales later in the year, with nearly 20% of Group A members making sales in December as compared with just 7% of Group B making sales in December of 2016.



It is also noteworthy that: -

- Group A's yields of pigeon peas have increased by an impressive 58%
- Group A have good and relatively constant gross profit percentages
- Group B have lower gross profit percentages suggesting they are not yet in control of all their costs, which can be addressed.
- A number of farmers this year mentioned one particular benefit of their good harvests being that they were able to supply their contribution to the Managhat School Feeding Programme from their harvests as opposed to having to give a monetary contribution². Although this was not the case across the board it's exciting to see the two programmes working together.

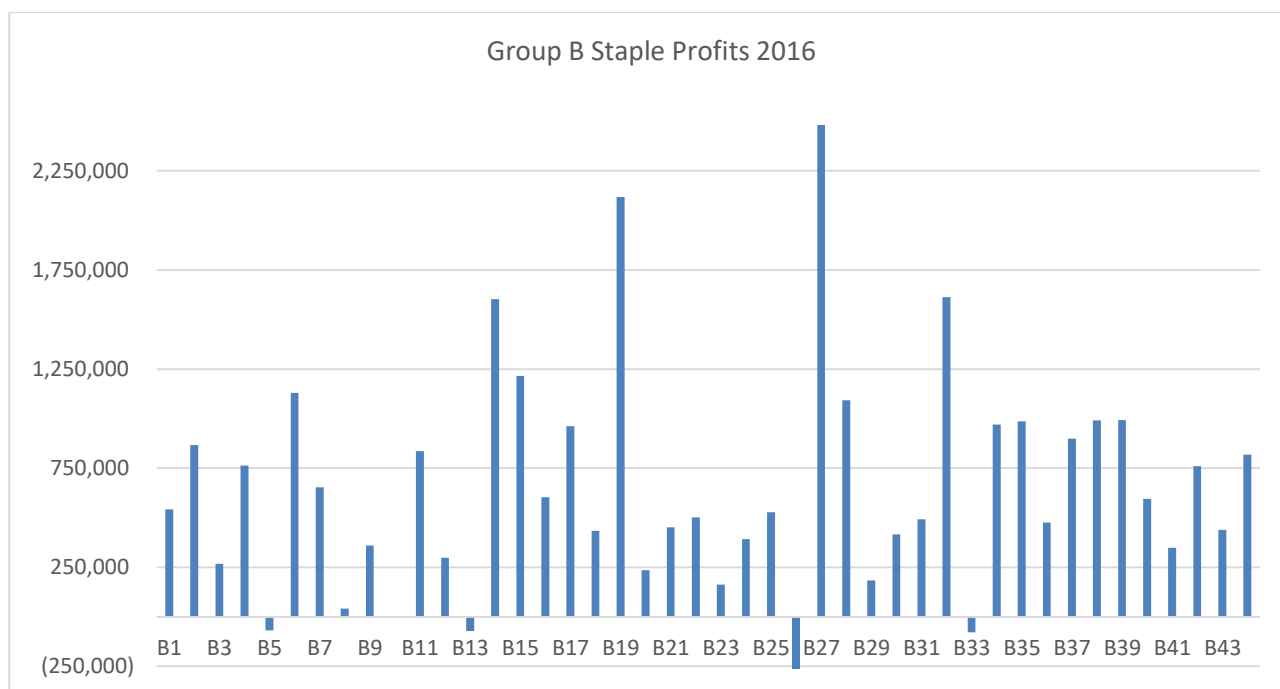
The graph below combines both maize and pigeon peas into a 'Staples' figure³ and makes a year on year comparison for Group A. It shows that 75% of farmers are doing better than they were in 2014 which is great news. Of the remaining 25% (5) farmers, two are borderline, one failed to grow anything for sale, and two reduced by 50% which is a concern and will be investigated. (It may be that they farmed less land this year.)



² The School Meals Programme is a community managed programme established with the support of LTT that ensures every child gets a hot meal at lunchtime at the primary school

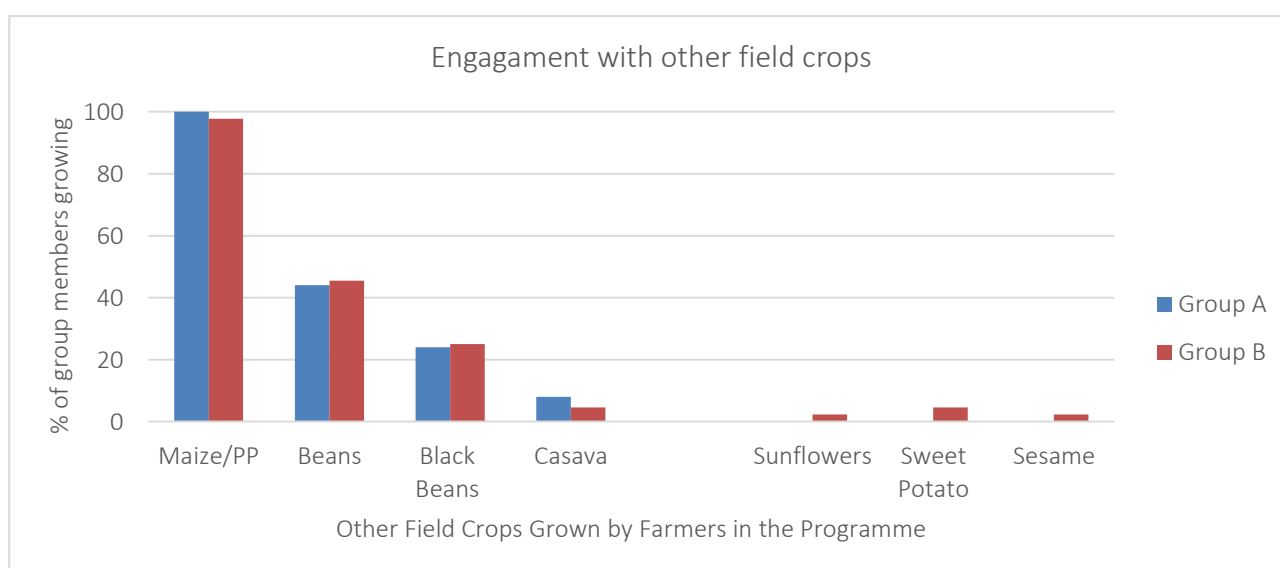
³ When looking at profits the two crops, maize and pigeon peas, they are combined together as the two are most commonly often cropped together and as a result the costs for things such as hiring land, ploughing and preparation for planting etc. are spread across these two crops

With regards to Group B, 91% (39 out of the 43 growing staples) generated a profit. Collectively the group made a profit of Tsh29,023,700 from staples, their individual profits from staples are illustrated below.



3.2 Other Field Crops

In addition to maize and pigeon peas members of both groups also grew other field crops such as beans, cassava, sunflowers and sesame as illustrated in the graph below. These other field crops provide an important additional income stream for farmers. For example, one farmer in Group A made the extremely astute decision to grow a commissioned crop of cassava, which has low input costs, and therefore guaranteed her an income which reduced the pressure on her staples crops where she struggles to make good money.



The groups' engagement with other field crops demonstrates some diversification which is extremely positive. Similar to last year, 64% of Group A farmers included beans, black eyed beans and/or cassava in



their crop mix. Some farmers had planned to grow additional field crops but changed their minds in light of the weather and water concerns.

55% of Group B farmers grew at least 1 additional field crop. Interestingly, a larger proportion of members grew more field crops than they had initially planned. The number growing black beans increased from 9% to 25%. This may be due to the farmers adopting a diversification policy following their training.

The table below illustrates the profit and gross profit percentages achieved by the groups from these additional field crops, demonstrating their significant contribution to improving income security.

Crop	Group	Profit (Tsh)	Average Profit (Tsh)	Average GP% for those making a profit
Beans	Group A	3,318,900	331,890	74%
	Group B	4,195,100	209,755	78%
Black beans	Group A	653,100	108,850	72%
	Group B	3,181,800	289,182	74%
Cassava	Group A	141,000	70,500	100%
	Group B	530,000	256,000	100%
Sesame	Group B	14,200	14,200	17%
Sweet Potato	Group B	215,000	107,500	88%

Alongside diversification we also train farmers in particular drought resistant crops such as cassava to improve farmer's resilience against climate shocks. Regrettably, just 2 farmers in Group A and 2 farmers in Group B grew cassava, all of them achieved a 100% gross profit percentage, demonstrating its value as an additional income stream. Despite its significant income potential, drought resistance and low inputs, there appears to be limited engagement with this crop. We have learnt from our work so far that farmers often have to see the impact or benefit of a change before they are prepared to embrace it which is perhaps part of the reason there are so few farmers in the groups growing cassava. In previous years concerns about particular pests such as moles and the risk of theft of such a valuable crop have been raised as prohibitive factors and these appear to continue to play a part in limiting engagement.

This is the first year that sesame has appeared in a farmers activities whilst with LTT, although the farmer in question made a profit we understand that sesame is not a farm friendly crop in that it depletes the soil after a few years and shifting cultivation is promoted as a way of managing the crop, this in turn results in clearing land through slash and burn of shrub and forest, an activity we are keen not to encourage given the extensive deforestation occurring locally, so we will be monitoring this crop closely.

11 members of Group B (25%) grew black beans, a significant increase in those engaging in black beans production as just 4 of the group had originally planned to grow them. All 11 of these farmers made a profit. In Group A, 6 farmers (24%) grew black beans with 5 of them making a profit, the single farmer who made a loss had exceptionally high costs and harvested just one bag, if this farmer's costs were more in line with those of the other farmers growing black beans he would have made a profit.

11 members of Group A (44%) and 20 members of group B (45%) grew beans in 2016. Across the 2 groups 24 farmers made a profit. 2 farmers in Group A did particularly well, harvesting 18 bags of beans between them and each making profits of over Tsh700,000. This is a significant achievement given that the majority of farmers this year were dissatisfied with their beans and struggled to produce what they had hoped to; some were also dissatisfied with the selling price they had been able to secure. Four of the farmers made a loss as a result of harvesting nothing from their fields whilst still investing in farm preparations and thus incurring costs to the household.



3.3 Vegetables

Group members now report more people growing vegetables and people growing a wider variety of produce. Farmers also report being able to produce more from their vegetable plots as a result of better management and that they are eating vegetables on a more regular basis, supporting improved household diet. This they explain is a result of improved skills and knowledge gained through the program and it's great to see these developments and to see the increasing value being placed on small scale domestic vegetable production by members of the farming groups.

As a result of the 2-day training course on nutrition and well-being farmers are growing vegetables for domestic consumption as well as selling any surplus. In Group A, 68% of the farmers (17 of the 25) grew vegetables to feed their families, while only 12 of them (48%) grew sufficient vegetables to be able to sell to the market. In Group B 70% of the farmers grew vegetables for home consumption and 45% (20 from 44) produced for market. Household consumption is predominantly leafy greens such as Sukumawiki, Mnafu and Mchicha. Many other farmers had planned to grow vegetables but it appears that when assessing the situation and noting the changes in the weather some revised their plans.

3.3.1 Tomatoes

	Profit 2014	Profit 2015	Profit 2016
Tomatoes Group A	Tsh5,317,500	Tsh2,196,300	Tsh5,388,000
Tomatoes Group B			Tsh1,797,500

Tomatoes continue to be the most popular choice for those wanting to grow vegetables for sale with 40% of farmers growing tomatoes. As we can see from the above chart, Group A's profits have returned to 2014's record level. 7 of the 10 tomato growers made a profit and some were particularly successful this year with one farmer generating a profit of over Tsh2,000,000 and two others making over Tsh1,000,000.

This level of profit is a significant achievement for the farmers, particularly considering the challenges faced with low selling prices, high competition, pests and limited rainfall during the tomato season. In some areas 'drought-restriction-rules' were even put in place at local water points preventing farmers using water from these sources for agriculture. For one farmer, this meant an exceptionally poor harvest both in terms of quality and quantity, after harvesting he sold what he could and fed the remainder to his cows feeling his crop had little value.

Of Group B 10 farmers grew tomatoes, with the majority (8 out of 10) making a profit. One of these farmers did extremely well making close to Tsh1,000,000. In general, the incomes achieved by each individual farmer in this group were lower than those achieved by Group A farmers, with average profits of Tsh179,750 per person compared to Tsh343,566 from Group A. Group B identified water and pests as the most significant issue in terms of tomato production, with some farmers who had planned 2 crops of tomatoes having to settle for one because of these challenges.

3.3.2 Peppers

	Profit 2014	Profit 2015	Profit 2016
Peppers Group A	Tsh495,000	Tsh36,000	Tsh214,000
Peppers Group B			Tsh-64,000

One farmer in Group A planted peppers this year and he achieved an enormous success managing to harvest and sell two crops over the course of the year with the second crop achieving an extremely high selling price. In total, he made a profit of Tsh214,000, far exceeding his own expectations. One farmer in Group B also grew peppers unfortunately making a significant loss on his crop due to poor rainfall.



3.3.3 Greens

	Profit 2014	Profit 2015	Profit 2016
Greens Group A	Tsh 311,500	Tsh 302,000	Tsh 164,000
Greens Group B			Tsh 88,000

4 farmers from Group A grew 'greens', vegetables such as Sukumaweki, Mnafu, Mchicha and Chinese Cabbage, generating an average profit of Tsh41,000. Group A's collective profit for greens amounted to Tsh164,000. This is a significant profit from such low priced crops.

10 farmers from Group B grew greens for home consumption and 4 of these also grew for profit. Between them they generated a profit of Tsh88,000. The 6 farmers growing for home consumption will be indicated as a loss in the diversification chart on Pages 23. This is because the cost of seeds set against a zero income is technically a loss, even if the household has made a saving by not buying in the market.

3.4 Fruit Production

		Profit 2014	Profit 2015	Profit 2016
Fruit Profit	Group A	Tsh 180,000	Tsh 679,000	Tsh 2,230,300
	Group B			Tsh 442,000

48% of Group A (12 of 25) and 16% of Group B (7 of 44) grew at least 1 variety of fruit in the last year. For Group A this represents a significant increase in engagement with fruit as cash crops as 7 new farmers have begun reporting fruit production and sales this year.

Group A have significantly increased their fruit profits, making Tsh2,230,300 in 2016. This far exceeds last year's profits and even their own expectations. A significant contributor to this is the work of one individual farmer, described in the case study below, who grew watermelons. His profits account for approximately 1/3rd of the group's overall profits. Others in the group have grown avocado, mangoes, pomegranate and bananas.

Avocado continues to be the most popular choice amongst farmers with 9 out of the 12 farmers in Group A and 5 of the 7 farmers in group B growing avocados. Group B made profits of Tsh295,000 from Avocado, over half of their overall fruit profit, generating on average Tsh59,000 of profit per grower. Papaya, mango, soursop⁴ and bananas account for the remainder of the group's fruit profits. In Group A, average profits per farmer from avocado were higher at Tsh80,222 per farmer but there is also greater variety in terms of production and income with one farmer producing 600 avocados, securing a significantly higher than average selling price and making a profit of Tsh340,000 whilst other farmers produced around 200 avocados and made just Tsh30,000 in profit.

LTT aim to re-establish a tree nursery at the school to supply farmers with fruit trees, as we did successfully a few years ago with Group A farmers, this tree nursery will also create an additional resource for the training programme enabling farmers to improve and develop their skills.

⁴ A type of fruit, sometimes known as a custard apple

Case Study: Juma

Juma is a member of Group A. He lives and farms near the lake and like his neighbours his success year on year is significantly affected by the rains. In dry years, he can do reasonably well whilst in normal and wet years, when others do well, he struggles as the land he farms becomes waterlogged.



In 2016 Juma grew maize, pigeon peas and beans, although he had planned to grow tomatoes he chose to abandon this plan as the ground was too wet and he was concerned they would rot in the ground.

Instead he embarked on a highly successful entrepreneurial venture. Together with a partner who owns a pump he used the money he made from his sale of beans and pigeon peas to invest in growing watermelons. Being down near the lake his land is well suited to a watermelon crop as he can be assured of a water supply from the lake. In planting the crop, he drew on the knowledge he had gathered in the programme about appropriate spacing and constructing ridges he fashioned his own system of trenches to direct the water he was pumping from the lake to where it was needed.

The watermelon enterprise had some high costs due to the amount of pest control and diesel required to pump water to the fields but when it came to selling their harvest the two entrepreneurs collected Tsh3,200,000 which they split! For Juma this meant taking home a profit of just over Tsh800,000. Seeing what a success this system was and how appropriate the watermelons were for his land; he's been inspired to try something similar again in the coming year. At the beginning of the year he'll grow maize, pigeon peas and beans as he still needs these to feed the family and then once he's harvested and sold the surplus he will reinvest in the watermelon enterprise again.

'The watermelons saved us in the last year, the maize crop was small because of all the water and so we needed it all for ourselves and to support the school feeding programme.'

3.5 Livestock and Milk Production

		Profit 2014	Profit 2015	Profit 2016
Milk Profit	Group A	Tsh3,821,400	Tsh4,18,000	Tsh1,614,700
	Group B			Tsh2,427,200

In 2015, 11 members of Group A sold milk to the market and neighbours from their cows and made a good profit but in 2016 only 5 farmers reported milk sales (some produced small amounts for home consumption). This is a significant reduction in sales so we questioned the farmers who informed us of a new situation has developed which is beyond our control. To produce milk the cows must have given birth however the community are suggesting that they have had problems getting the cows pregnant through artificial insemination from the vet. While the price of insemination has increased so has the number of failures, which the vets are required to rectify for free. There are two problems here, firstly the vets are busy and the window of opportunity small, and secondly there is the belief that the product they are using is not always genuine.

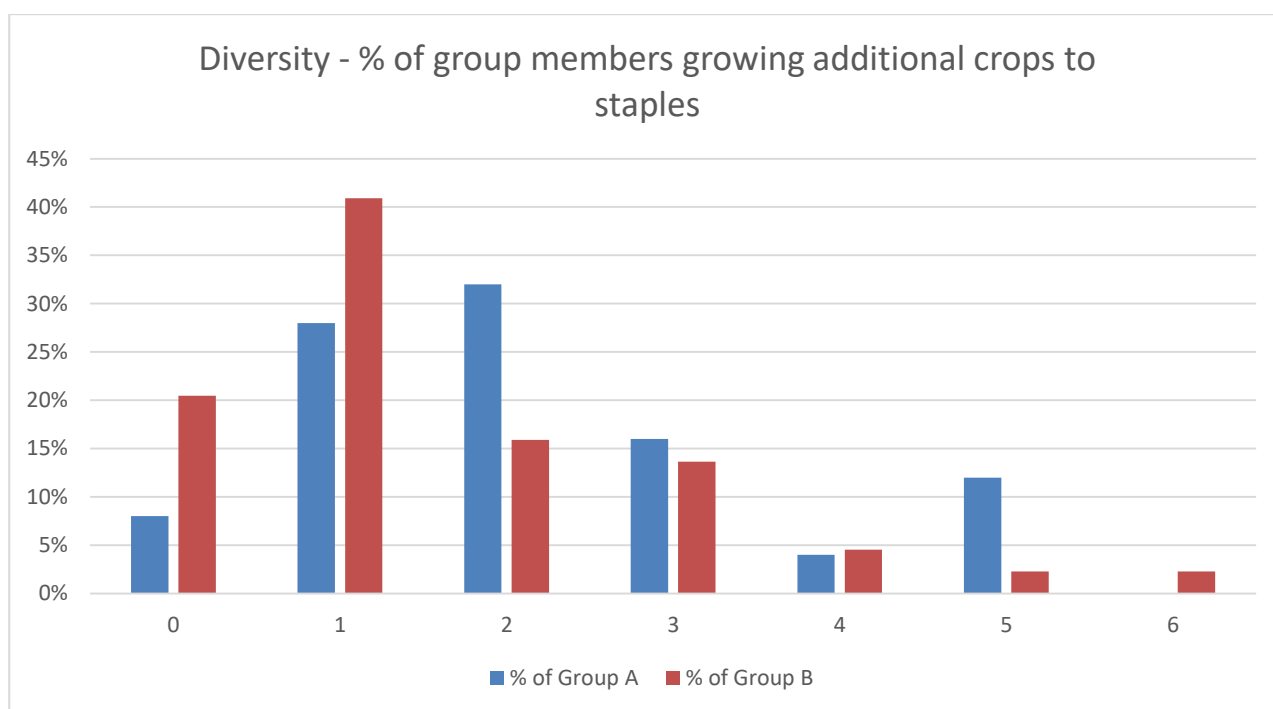
In Group B, 5 farmers recorded milk production (11% of the group) and generated a collective profit of Tsh2,427,200, securing selling prices of between Tsh700 and Tsh1000. Those achieving the higher prices

have been selling to the market whilst those at the lower price are selling to their neighbours. The significant income generated by these farmers illustrates the significant potential of milk to support farmers' incomes and improve cash flow.

With both communities having 5 farmers producing milk and the profit levels being significantly different we can assume that the quantity of milk produced was greater with Group B farmers. This may be due to better feeding programmes or may be due to better quality of cows. With the CASO being able to impart knowledge of how to plant for fodder, we hope that both groups can increase their output.

3.6 Diversification

Product diversification is a vital component of improved income security. If one crop fails a farmer has alternative sources of income. In some cases, the diversification can provide a constant stream of money all year round which is essential for good cash flow. The choice to diversify is determined by land availability, water and knowledge. We have shared our collective knowledge, but farmers themselves have to determine whether to plant, where, and how to irrigate. Not everyone can grow everything they have learnt about, but the more they diversify the greater their chances of ending the year in profit.



It is clear from the above graph that Group A's experience has helped them improve their diversification and that in time we would expect Group B to follow suit.

From the chart below we can see that only one farmer from Group A ended the year having made a loss, down from 4 farmers the previous year. This one farmer has not diversified away from just maize and pigeon peas. In 2015, we recorded 11 loss making activities across all the crops (13%) and this year it has reduced to just 4 (5%) which represents great progress.



Farmer	Staples	Other Staples	Tomatoes	Peppers	Greens	Fruit	Milk	other income	Total
A1	P	P			P	P	P		P
A2	P					P	P		P
A3	P	P				P	P		P
A4	P					P			P
A5	P		P						P
A6	P	P				P			P
A7	P		P						P
A8	P	P							P
A9	P	P	P				P		P
A10	P	P	P	P	P			P	P
A11	P	P	P		P	P	P		P
A12	P	P						P	P
A13	L								L
A14	P		L						P
A15	P	P				P			P
A16	P					P			P
A17	P	P	P						P
A18	P	P	L			P			P
A19	P	P							P
A20	P								P
A21	P	P					P		P
A22	P	P	P		P				P
A23	P		L			P			P
A24	P	P		P		P			P
A25	P	P				P			P

P = Profit, L = loss

This chart shows the diversification and the profitability of each farmer's crop

In Group B (see chart below) 42 from 44 farmers (95%) made a profit over the course of the year. Both of the farmers who made a loss made their losses on maize and pigeon peas. One of these farmers was entirely reliant on these staple crops while the other grew and made a profit on Tomatoes. Regrettably, the farmer with no diversification fell ill during the year and as a result was not able to undertake agricultural activities to the same extent and intensity as she had planned which has significantly affected her income. The table below illustrates the profit and loss experiences of this second group of farmers.

Farmer	Staples	Other field crops	Tomatoes	Peppers	Greens ⁵	Other Veg	Fruit	Milk	Total
B1	P		P						P
B2	P				L				P
B3	P								P
B4	P								P
B5	L				P			P	P
B6	P	P	L					P	P
B7	P				L	P			P
B8	P								P
B9	P								P
B10		P							P
B11	P	P	P						P
B12	P	P							P
B13	L								L
B14	P	P					P		P
B15	P	P	P				P		P
B16	P	P							P
B17	P	P							P
B18	P	P							P
B19	P								P
B20	P	P							P
B21	P		P						P
B22	P		L						P
B23	P	L			L		P		P
B24	P	P							P
B25	P	L			L				P
B26	L		P						L
B27	P	P							P
B28	P	L			P		P	P	P
B29	P								P
B30	P	P					P		P
B31	P				P				P
B32	P	L							P
B33	L							P	P
B34	P	P		L			P		P
B35	P	P							P
B36	P								P
B37	P	P	P		P		P		P
B38	P	P							P
B39	P		P						P
B40	P	L							P
B41	P		P					P	P
B42	P	L			L				P
B43	P	P							P
B44	P				L				P

P = Profit, L = loss

This chart shows the diversification and the profitability of each farmer's crop

⁵ All the losses are caused because the farmer kept the harvest for this family rather than sell

4. Formative assessment of the programme by participants

In October 2016 LTT and MCDO met with farmers to discuss the program and their opinions of it as well as the difference farmers felt it was making for them individually.

The farmers talked about the differences in terms of their farming, improving their skills and knowledge and learning about new techniques they could implement on their own farms and the resulting improvements in their production and farm management. Farmers also talked about their increased engagement with a wider variety of crops, particularly root vegetables that they had not previously considered. Growing vegetables and eating fruit and vegetables on a more regular basis was cited as a significant change for farmers, with more farms engaging in this form of market gardening, being able to produce more from their own plots and growing a wider variety of fruit and veg, although water was cited as a barrier for some. Interestingly, a number of farmers mentioned that they have built a well at their homes, not as a direct result of the training programme but because they saw the well being dug at the Managhat Primary School and went along to learn how to construct it and decided to dig (or have one dug) for their own home.

Improvements in incomes was also highlighted as a significant effect with farmers discussing ways in which they have put those increased incomes to work, paying for schooling costs and making home improvements or in some cases adding new rooms as well as investing in livestock as an entrepreneurial investment. This was an unexpected and extremely positive outcome that some suggested is the most beneficial element of the program for them individually. Enabling farmers to move into livestock management and sale and milk production has the potential to reduce their dependence on field crops and climate vulnerable agriculture supporting their income security. We hope that this investment will be further bolstered as a result of access to livestock care in the community from John.

Overall the program appears to be being extremely well received and the group formation seems to be appreciated in that it creates a forum for peer learning and group support that is highly valued.

It is great to see farmers enthused about the programme and humbling to talk with those who feel they have benefited in a way that allows them to make improvements in their own lives, in line with their own priorities.



Farmers in Group B discussing impact



5. Budget

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Training workshops

Title	Length	Approximate Dates
Introduction to the Programme, record keeping and planting	3 days	October
Farm management	2 days	February/March
Livestock Management	2 days	Flexible
Harvesting and post harvesting	2 days	June
Enterprise Training	1 day	Flexible
Vegetable Farming	½ day	Flexible
4 x ½ day workshops on assorted topics	4 x ½ day	Flexible

6. Challenges and Lessons Learnt

Attrition and replacements

At the end of Group B's 1st year in the program 6 members left the group. 4 of these were asked to leave by other members due to their lack of commitment to the programme and the training, disruptive behaviour and issues with repayments of loans, the other 2 left of their own volition. These members were replaced with new farmers from the community. In an incredible endorsement of the value of the program from within the community 20 people applied for the 6 spaces. Although extremely gratifying that there is so much interest in and value placed on the program by the community the act of replacing those who had left caused a number of issues for the program in terms of delivery and monitoring. To address this, we have incorporated the new members into the newest group of farmers for the purpose of delivering training as well as providing a few catch-up sessions on other topics to be delivered by John. From the point of view of monitoring the programme these new members will be treated as new joiners in 2016. Going forward we have asked the groups not to replace members who leave groups in order to avoid similar issues in the future.

Data collection

In response to the challenges of collecting data we began to face last year LTT explored possible providers of mobile data collection to reduce human error in our data collection and speed up our analysis. We have selected 'Datawinners', a provider of mobile data collection software that offers a good balance between customer support and costs. Their system allows us to collect monitoring data from all the farmers in the programme using an app installed on team member's phones. These submissions are uploaded direct to an online database which we can access from the UK. This will significantly improve the efficiency of our monitoring and evaluation work for the programme and speed up our ability to feedback to both participants in the programme and to those who fund our work. We have successfully completed training and trialling of the new technology and have begun using the system to collect regular monitoring data from the newest farmer's groups. We expect there will be some refinement and fine tuning to be done over the coming year as this is a learning process for all at LTT and MCDO but we are extremely hopefully of the benefits this investment will bring us when we come to review progress this time next year.

Savings

Each year loans have successfully been fully repaid, however savings contributions are currently proving elusive. We have held detailed discussions with each group and recognise that one of the challenges for the



farmers is thinking about the long-term benefit of the savings programme and prioritising a long-term pay-out over meeting their shorter-term needs. This acts as a barrier to group members making savings contributions. That savings are also contributed as a lump sum at the end of the year also makes it difficult for farmers to reconcile this contribution with other competing needs. Initial discussions have already begun and further group discussions will be held in July to understand and address people's concerns and to develop an alternative approach to the savings element of program so that it works for the farmers. The challenges faced by the savings program mean that we are slightly off track in terms of reaching sustainability of the access to capital element of the program for Group's A and B and are therefore keen to review this element and then, provided a new system can be taken forward, offer loans for an additional 2 years to the current groups to enable them to build up a savings pot to follow on from the loans. Without providing the extra time needed for this we are concerned that the withdrawal of the loan capital at the beginning of the season will leave farmers short and have potentially negative impacts on them.

7. Conclusions

1. The impact of the programme continues to be highly valued by the community and the groups' collective income has continued to improve, year on year. The programme in Managhat now directly benefits 125 farmers who are adopting and applying new techniques, skills and ideas to support themselves and their families. The income they are generating is supporting them in achieving their own priorities and improving their standards of living, investing in home improvements, schooling, livestock and so on.
2. Diversification continues to play an important part in income security and it's encouraging to see so many of the group members engaging in more than just the staple crops of maize and pigeon peas, although we recognise that for some it is impossible to diversify, not due to lack of desire and knowledge, but due to other personal constraints such as time and land availability.
 - a. We believe the levels of diversification can still be improved, so as to reduce staple dependency and through visits to the farmers we can begin to identify the hurdles they face that are preventing them from growing additional crops.
3. It appears that more farmers are engaging in small scale vegetable production for the household, creating a non-monetary benefit in terms of household nutrition.
4. The newest group of farmers, Group C will complete their training later this year and we will review their progress early next year whilst a new group of farmers will be selected in July/August to join the programme in September
5. The groups are working together and have access to each other, through regular meetings without MCDO presence, for support and guidance.
6. LTT have made changes both in the UK and in Tanzania to ensure that we have the resource in place to continue to deliver this programme as our remit expands both within Managhat and to new communities and this has had significant and positive impacts.
 - a. Sophie has supported the MCDO team in improving community engagement in all aspects of the project which is having a positive impact on their perception of their project; trained and supported the new agricultural team to deliver the project in a more logical and planned way; researched, implemented and trained the team to use mobile data collection which will bring about huge efficiencies in the future (all analysis of data was done manually this year which was time consuming but remains extremely valuable as a measurement tool).
 - b. The CASOs and the new Agricultural Officer have brought renewed energy, passion and ownership of the programme and are dedicated to make it succeed, and to serve their respective communities. Their additional knowledge has improved the quality and timeliness of the training and allowed additional modules to be attached to it allowing us to enhance our offering to farmers.
7. The school's existing livestock facility has been improved and developed acting as an essential base to deliver livestock training and further encouraging farmers to return to the school where they can see some of the trials we run at the school's market garden, such as drip irrigation.



8. The nutritional programme is being revised to include improved evaluation and learning which will help on other programmes as well
9. The saving and loans scheme needs some tweaking and this process will be undertaken in July in full consultation with the farmers so that it works for them whilst achieving the goals set by LTT.
10. The farmers in all groups could benefit from increase co-operative approach to their farming and we are keen to begin these conversations and explore ways of working together in terms of purchases and buying groups so that all can benefit.
11. The school market garden would benefit from a tree nursery so that fruit and firewood saplings can be made available to the community and the school, alongside training in establishing tree nurseries and managing trees, so that in 5 years' time they can benefit from the income the trees will provide.
12. All the farmers who made a loss in 2016 need to be visited and their situations assessed
13. The budget failed to take into account some of the costs

8. Plans for the year ahead

The major purpose of monitoring and evaluating progress is to learn what is happening to farmers in the programme and to understand whether changes need to make to address areas that are not achieving profitability. It is therefore essential that the programme continues to adapt and evolve in consultation with the different stakeholders. As a result of this review LTT plans to consult and/or action the following.

1. The savings element of the loans programme is not achieving its goal. This will be discussed and addressed as it is a core element of sustainability. In that regard, we wish to extend the loans for Group A and B for 2 additional years enable the savings element to take effect.
2. Conduct further monitoring, evaluation and learning (MEL) on data winners and make adjustments to the questions where ambiguity is found or the answers not provided.
3. Increase the levels of home visits from the CASOs so that bespoke advice can be offered, this will be of particular value to the farmers who made losses on certain crops last year.
4. Ensure that the CASOs are involved in a continual learning programme through external training with other specialists. This could include trips to the Annual Agricultural Show in Arusha (Nane Nane), training from Sevia (Moshi) and Sustainable Agriculture Tanzania (SAT) (Morogoro)
5. Develop the tree nursery at the Managhat School to provide the community with a source of young, healthy fruit and timber saplings to plant at their homes and to create an additional training resource
6. Add poultry to the livestock element of our demonstration activities at the Managhat Farm
7. The problems raised by the community over artificial insemination need to be investigated further with the local vet.
8. New farming group – In August we plan to work with the community to select the next 50 farmers to join the programme later in the year. As we move further and further into the community we have to be prepared for the increased risk of failures to repay loans if we are to reach those most in need. Subject to farm sizes, consideration could potentially be given to assessing whether their needs are better served through our edible gardens programme.
9. LTT will internally discuss the challenges of accounting for domestic consumption
10. LTT want to establish 'product groups' for farmers to share how they have been successful when they have been with farmers who have been less so. By sharing their knowledge we will get to understand further the intricacies of Managhat farming.

Appendix 1: Income Tables

1.1 Overall Income of Group A farmer's year on year

	Profit 2014	Profit 2015	Profit 2016
A1	1,297,000	3,602,600	2,707,500
A2	472,400	201,800	400,600
A3	442,700	1,036,700	1,224,200
A4	2,519,000	1,615,300	1,280,000
A5	1,068,800	746,000	1,661,600
A6	1,808,000	1,741,400	2,036,500
A7	2,113,500	3,474,500	2,780,000
A8	168,700	-57,600	516,500
A9	4,014,400	6,128,800	7,061,000
A10	1,126,500	2,409,700	1,962,700
A11	1,890,800	933,000	1,434,200
A12	2,372,400	2,365,500	3,397,000
A13	297,800	-109,700	-15,700
A14	1,282,900	83,800	585,600
A15	1,704,500	989,098	2,063,800
A16	2,557,500	3,894,100	2,988,000
A17	1,128,700	1,400,200	1,403,000
A18	358,400	-247,000	1,310,400
A19	802,400	-765,700	401,000
A20	249,000	359,200	391,900
A21	1,644,800	643,000	1,221,100
A22	2,731,400	5,970,600	2,821,000
A23	215,400	1,070,700	418,400
A24	772,800	2,047,400	1,719,600
A25	361,900	77,900	880,900

1.2 Overall planned and actual incomes for Group B farmers

	Actual Profit 2016		Actual Profit 2016
B1	1,489,400	B30	744,000
B2	860,000	B31	506,200
B3	267,000	B32	1,602,400
B4	762,800	B33	109,100
B5	314,300	B34	1,165,950
B6	2,288,400	B35	1,126,000
B7	705,000	B36	475,800
B8	40,900	B37	1,465,500



B9	358,800	B38	1,665,400
B10	127,000	B39	1,170,800
B11	1,548,500	B40	549,200
B12	313,100	B41	1,067,400
B13	(72,000)	B42	748,000
B14	2,170,800	B43	566,500
B15	1,452,500	B44	814,600
B16	794,000		
B17	1,421,000		
B18	1,360,200		
B19	2,118,800		
B20	249,600		
B21	601,900		
B22	449,200		
B23	152,700		
B24	925,800		
B25	501,600		
B26	(212,500)		
B27	5,186,400		
B28	1,744,400		
B29	184,000		

Thank you.