



Livingstone Tanzania Trust

Livingstone Tanzania Trust

Agriculture Programme

Out-Farming Training in the Managhat Community



The traditional method for releasing the beans from the pods is to beat the harvested crop with a stick.

Report by: Livingstone Tanzania Trust

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People - Partnership - Participation - Progress

www.livingstonetanzaniatrust.com Charity No. 1119512



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Please note that in this report we are using the exchange rate of £1.00 = TSH 3,000



Executive Summary

The Livingstone Tanzania Trust is a UK registered poverty alleviation charity working in four communities in Babati in the Manyara Region of northern Tanzania with our sister organisation the Manyara Community Development Organisation (MCDO). Our joint goals for the Managhat community are to develop a self-sustaining primary school that provides a high quality of education to the community's children regardless of their gender, ethnicity or religious beliefs; to provide community members, especially women, with training covering health and wellbeing, agriculture, animal husbandry, environmental management and entrepreneurship; and to facilitate a self-sustaining savings and loan scheme. In this way the community will be empowered to meet and exceed their basic needs, improve their standard of living and escape from poverty.

We seek to achieve this by:-

- ① Investing in the educational environment, the teachers and in teaching/learning resources for the school
- ① Investing in enterprise activities that both educate and generate profit for both schools and the community
- ① Providing community members with agriculture training through our local partners; through peer to peer training; through a demonstration plot; and through exposure to what other NGOs are doing
- ① Providing a dedicated community extension officer who can provide training and support and demonstrate effective animal husbandry and small scale vegetable growing techniques
- ① Introducing a dairy cow pyramid scheme with the potential for scaling into a dairy business
- ① Investing in rainwater harvesting, fuel efficient stoves and solar power at the household level

Working with the local primary school assisted us in building a trusting and respectful relationship with the community through which we have been able to launch further projects of which the Out-Farmer Training is one. This report focuses on the performance of the initial 25 farmers and on understanding the challenges they face on a daily basis and as they train 50 of their peers and include them in their savings and loans scheme.

In 2015 the group of 25 farmers increased their collective profit by 19% on the previous year which is a fantastic achievement because it was a highly challenging year for the farmers with problematic weather which impacted on the maize and pigeon pea crops (staples) and curtailed their more adventurous tomato and onion growing projects. Despite this they increased profit on their staples by 8%.

	Planned Profit	Actual Profit
2014	48,304,200	33,401,700
2015	121,421,700	39,611,298
2016	91,090,100	

On an individual basis there was a great variety in success levels and despite the overall increase in collective profits, actual profits fell short of the farmers' expectations for the year. In some cases their expectations were perhaps overly-optimistic, and this is something we need to work on with them. However it does demonstrate the growing ambitions, confidence and drive of the farmers in this programme.

The initial 25 farmers have started to train others in the community, starting with 2 each. (50 in total). The training is conducted at the trainer's home as well as at the group's agricultural demonstration plot where MCDO's Agricultural Officer can also provide additional assistance. Training has also been provided off site at establishments run by other NGOs. There have been a few teething problems with the training in terms of inconsistency which are being addressed.

The savings and loans aspect of the project is fully understood and all the loans were repaid in full and on time by all 25 farmers. However due to poor harvests none have been able to make contributions to the savings. They know they are going to have to double their contributions this year to make up for this.



Introduction

Background information

Livingstone Tanzania Trust (LTT) is a grassroots development charity that supports 4 communities in northern Tanzania, empowering individuals to meet and exceed their basic needs and improve their quality of life, with dignity and pride. Since 2007 LTT has worked in partnership with local organisations to develop and implement small scale, simple, replicable development models in education and enterprise that bring sustainable long term benefits. With enhanced knowledge, skills and improved resources schools and members of community based organisations are facing their challenges with confidence and self-belief and the impacts have been dramatic.



In 2013 LTT established the Manyara Community Development Organisation (MCDO) to be an umbrella organisation for smaller community based organisations (CBOs) in the region. The Board is made up of leaders of each CBO and representatives from each school. Projects are developed in collaboration with the community, ensuring our work addresses the needs and opportunities on the ground. In July 2015 we lost one team member and although a replacement has since been found, our resources were spread rather thinly in the interim. LTT and MCDO have adopted, where practicable, a participatory approach to project work working hand in hand with the community to ensure the projects meet their needs and enable the communities to fully own the projects that are being run. This is essential for long term impact and sustainability.

Education Programme

LTT works in partnership with community schools to promote and encourage an educated and healthy student population while also challenging gender disparity. This involves renovating and adding to basic school infrastructures; providing teacher training; improving student nutrition; enhancing agricultural skills through an Enterprise Programme; ensuring water and power security; and building energy efficient kitchens. We promote school-based profit generating schemes that can contribute to the school maintenance programme.

LTT has, between 2007-16, renovated/built 36 classrooms, 1 classroom for students with special educational needs, 7 fuel efficient kitchens including one fed with biogas, 5 toilet blocks, 3 libraries, 3 market gardens, 7 teachers' offices and 4 teachers' houses and provided hundreds of desks, chairs, books, other learning materials and teacher training. Our efforts feed 1,400 students a day and have provided an improved educational environment for over 5,000 children. The primary schools we support have moved rapidly from the bottom half of the academic performance league table to the top half and numbers of local parents wishing to send their children to these schools have grown in response. Absenteeism in these schools has fallen dramatically, in some cases from 30% to 5%.



New Classrooms at Malangi Primary School

In addition, through our policy of buying locally and using local skilled labour we have contributed significantly to the local economy. In 2015, for the second year running, LTT won "Best in Country Prize" in the Teach a Man to Fish Pan African Awards for Entrepreneurship in Education, a programme that also came 'Runner Up' across the continent. As a result of their improving standards, 3 of our partner schools have attracted ICT infrastructure investment from a local authority/NGO partnership. Managhat School was selected for a visit from the Tanzanian "Freedom Torch", in recognition of our successful biogas project, the first of its kind at a primary school in Tanzania.



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Enterprise Programme

Even the brightest students may fail to enter further education if the family's purse has competing priorities which results in further education being unaffordable despite it being the family's the best route out of poverty. By working with parents through enterprise groups, LTT are able to provide practical skills training such as agricultural lessons, business planning and development and cash flow management, followed by microloans and on-going support and mentorship. In this way parents are empowered to improve their incomes, meet more of their priorities and send their children to further education. LTT's loans and savings scheme now offers over 160 micro-loans across 5 enterprise groups. Loans are also provided to the Manyara Girl Guide group to assist them develop entrepreneurial skills in order that they can generate an income that can fund vital training for their membership.



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Out-Farming in Managhat

Programme Aims

The Agricultural Programme which forms part of our Enterprise Programme, is designed to enhance the existing knowledge of subsistence farmers so that they can improve their income security through greater income diversity and so become 'subsistence plus' farmers, meaning that the programme has the potential to lift participants and their families out of poverty for good.

Project Aims

The Out-Farmer Project in the Managhat community continues to evolve as it expands in order to reflect the changing agricultural needs within the community. As such the project aims to: -

- ① Enhance the knowledge, skills and tools of small holder farmers
- ① Improve household income security
- ① Improve diversification and productivity for both household consumption and retail
- ① Improve communication and collaboration between farmers
- ① Enhance the spread of knowledge amongst the wider community
- ① Improve household health and well-being
- ① Provide an on-going training resource within the community

Delivery

The initial training was provided to 25 farmers by MCDO staff through a series of workshops, seminars and hands on practical experience with a view that subsequent training would be provided by these farmers to their peers within the community. This peer-to-peer training has started for 50 new farmers with training being performed at the trainer's home and at a demonstration plot owned by the 25 farmers.

New farmers are eligible to join the existing savings and loans scheme which provides support to help kick start their individual aspirations.

A student has been selected from within the community to be trained in 'Livestock and Agriculture for Livestock Management' so that he may work in the community after graduation offering bespoke support and guidance.



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Progress

Introduction

The progress section of the report is divided into 3 parts.

1. The progress of the initial 25 farmers
2. The progress of the new 50 farmers
3. The progress of the sponsored student (future community extension officer) at the Bacho Agricultural Institute
4. Data collection

1. Progress of the 25 Farmers

Over the past two years, data concerning the planned and actual agricultural activities has been collected. The data when combined with 1-to-1 interviews provides a rare insight into the farming challenges and aspirations of subsistence farmers in rural Tanzania and allows the project to evolve to tackle issues raised.

Over the last year the farmers collectively have increased their overall profits by 19%. This is a fantastic achievement, especially when one considers the problems they have faced with erratic weather and insect infestations. The farmers must be congratulated for their hard work to achieve this.

	2014	2015
Actual profit from farming activities for all 25 farmers	TSH 33,401,700 £11,134	TSH 39,611,298 £13,204

At a household level however the picture is different; successes were not experienced across the board, some farmers did very well while others did poorly. Few of the farmers met their expectations, although for many that was not a surprise as they were highly ambitious in their planning. But why did some of the farms perform so poorly? Why did Peter Wando nearly quadruple his profits on the previous year, while Juma Alley had a near 100% decline in his?

In the following pages we will examine the different crops that were grown and see how those crops contributed to either the success of failure of the farm. Did the farmers successfully diversify their income streams or was it all just bad luck? What can be learnt from what happened this year?



Homemade pest control for the vegetable nursery



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	Planned Profit 2014	Actual Profit 2014	Planned Profit 2015	Actual Profit 2015	Change in ACTUAL PROFIT	% change in ACTUAL PROFIT
Elizabeth Msuya	1,461,000	1,297,000	2,696,400	3,602,600	2,305,600	178
Christina Lucian	811,300	472,400	1,010,500	201,800	-270,600	-57
Daudi Hamis	1,053,400	442,700	2,868,300	1,036,700	594,000	134
Elizabeth Lala	3,173,000	2,519,000	1,199,500	1,615,300	-903,700	-36
Adbi Issa Fulla	2,173,000	1,068,800	2,884,800	746,000	-322,800	-30
Constantino Dagharo	1,692,600	1,808,000	940,400	1,741,400	-66,600	-4
Emanuel Barhe	2,065,400	2,113,500	9,040,200	3,474,500	1,361,000	64
Felister Iddi	235,900	168,700	985,700	57,600	-111,100	-66
Habibu Ingi	5,945,000	4,014,400	27,878,000	6,128,800	2,114,400	53
Hamis Mambalala	2,036,500	1,126,500	5,195,600	2,409,700	1,283,200	114
Iddi Ducta	2,792,300	1,890,800	2,839,000	933,000	-957,800	-51
Isadori Kashmiri	2,995,800	2,372,400	4,124,300	2,365,500	-6,900	0
Josephine Joseph	1,802,000	297,800	1,550,400	109,700	-188,100	-63
Juma Alley Imbisha	1,398,900	1,282,900	2,460,600	83,800	-1,199,100	-93
Juma Hussein	1,911,200	1,704,500	13,221,500	989,098	-715,402	-42
Juma Ragabu	4,656,400	2,557,500	5,204,200	3,894,100	1,336,600	52
Mateo Barhe	1,869,100	1,128,700	1,443,800	1,400,200	271,500	24
Mohammed Akonaay	1,358,300	358,400	2,570,100	247,000	-111,400	-31
Musa Bura	1,225,400	802,400	5,439,500	765,700	-26,700	-5
Nduguru Ngaima	947,000	249,000	1,125,200	359,200	110,200	44
Omary Ducta	2,568,000	1,644,800	2,272,300	643,000	-1,001,800	-61
Paulo Kundasi	2,332,900	2,731,400	15,296,400	5,970,600	3,239,200	119
Peter Wando	297,300	215,400	2,916,200	1,070,700	885,300	397
Pedro Frances	1,320,000	772,800	3,685,800	2,047,400	1,274,600	165
Rosina Basil	223,800	361,900	2,573,000	77,900	-284,000	-78

Household Profits 2014 and 2015

The Staples (Maize and Pigeon Peas)

In their planting strategies the farmers consider the following:-

- ① Seed types – traditional seeds, which are more resistant to insects and whose produce can be replanted take longer to mature and so face the greater risk of unpredictable weather, while hybrid variety of seed which are more pest resistant but whose produce cannot be replanted grow faster and can produce a heavier corn, generating a more profitable harvest. There are many hybrids with different attributes and growing times and this can be confusing for the farmer.
- ① Location of land - In Managhat there are effectively two areas for growing maize: -
 - The lake flood plains – this area is low with close proximity to the water table so that if the rains fail the crops can still be successful. However, the soil has poor drainage and in heavy rains the plants are likely to rot.
 - The higher plains – this area is perhaps 50ft higher with good quality soil with good drainage so it does not get waterlogged during the heavy rains, but it also does not hold the water as well as lowland areas so in the dry periods the crops can struggle to get enough water.
- ① Risk averse – The group is a complete cross section of comparative wealth and family support. Some have children, extended families and strong roots in the community to assist them in the event of hardship while others are effectively single with absent grown-up children. This affects what risks they are prepared to take in their planting.
- ① Habit, tradition and superstition – some farmers have a specific date on which they plant each year regardless of the weather. They are averse to change because traditionally this cycle has benefited them and most years they do alright. No amount of global warming is going to encourage change in these ingrained practices.



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With so many factors to consider there is a certain degree of luck in production, more so now thanks to the increasingly erratic climate. In 2014/5 the short rains fell at the predictable time in November and December but the rains due in February did not fall and consequently the temperatures soared. For the majority of those who planted in December and early January they watched their plants wither and die while those who planted later were able to harvest some crops. 2015 was not a good year for maize production across Tanzania and our farmers saw their collective harvests fall from 699 sacks in the previous year to just 141 sacks this year - a devastating drop and a worrying fall in their anticipated income levels. Due to the scarcity of maize the price of maize increased from TSH 30,000 to TSH 72,000, good for those with a crop but disastrous for those now needing to buy food. The Government started to issue food aid to the poorest families.

The pigeon peas yields however increased collectively from 73 sacks to 97 sacks and the scarcity of food caused their price to soar as well from TSH 120,000 per sack to TSH 260,000 - 300,000. For some farmers this helped to mitigate the loss of income from maize. Whilst being planted at the same time as maize, pigeon peas are more resilient and are harvested much later in the year.

With both staple crops sharing the same field they share the same costs of production (rent, ploughing, planting, weeding, harvesting etc.). We are therefore able to get a clear picture of the profitability of the staples harvest year on year and we can see that collectively the farmers improved their income, albeit with a lower gross profit percentage. This is shown in the chart below. However as mentioned earlier, those farmers who planted early failed to generate in some cases a single bucket of maize. 14 of the 25 farmers did worse than last year while 5 farmers actually made a loss on their staples as can be seen on the chart on the following page.

	Planned 2014	Actual 2014	Planned 2015	Actual 2015	Planned 2016
Maize yield (sacks)	789	699	1,174	141	942
Pigeon pea yield (sacks)	151	73	181	97	169
Maize income	32,777,000	21,863,000	42,480,985	8,775,000	41,305,000
Pigeon Pea Income	14,884,000	8,053,000	18,456,000	24,295,988	33,450,000
Total	46,821,000	29,916,000	60,936,985	33,070,998	74,755,000
Costs	10,037,280	9,097,200	13,887,100	10,616,100	17,636,100
Profit	36,783,712	20,818,800	47,047,885	22,454,898	57,118,900
Gross Profit	79%	70%	77%	67%	76%

Collective Income from Staples

In summary the seeds and the soil are known factors when the farmers consider their planting strategies, but the weather is the unknown factor and in this case it caused great hardship for many farmers. However, part of the training that LTT provided was to challenge the near total dependency on the maize/pigeon pea crop so that in the event of poor rains, like this year, the farmers would have other income streams – a coping strategy for main crop failure. These strategies are to diversify what they grow and to include crops that produce at different times so that cash flow can be improved. This year therefore is the first major test of whether they have applied this lesson, how it has worked and if it has not been implemented, why not?



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	Actual Staple Profit 2014	Actual Staple Profit 2015	Change in ACTUAL PROFIT	% change in ACTUAL PROFIT
Elizabeth Msuya	685,000	2,594,300	1,909,300	279
Christina Lucian	385,400	201,800	-183,600	-48
Daudi Hamis	317,200	24,600	-351,800	-111
Elizabeth Lala	1,271,200	313,900	-957,400	-75
Adbi Issa Fulla	1,068,800	638,000	-430,800	-40
Constantino Dagharo	1,082,400	748,600	-333,800	-31
Emanuel Barhe	1,501,500	2,469,300	967,800	64
Felister Iddi	168,700	-105,600	274,300	-163
Habibu Ingi	1,466,400	3,421,200	1,954,800	133
Hamis Mambalala	1,103,500	1,272,900	169,400	15
Iddi Ducta	658,800	377,000	-281,800	-43
Isadori Kashmiri	1,370,400	1,889,700	519,300	38
Josephine Joseph	297,800	-107,200	-405,000	-136
Juma Alley Imbisha	612,400	77,800	-534,600	-87
Juma Hussein	1,704,500	893,798	-810,702	-48
Juma Ragabu	2,033,000	2,670,700	637,700	31
Mateo Barhe	399,700	949,800	550,100	138
Mohammed Akonaay	153,400	-362,000	-515,400	-336
Musa Bura	802,400	-55,70	-858,100	-107
Nduguru Ngaima	261,000	270,700	9,700	4
Omary Ducta	1,644,800	260,600	-1,384,200	-84
Paulo Kundasi	681,400	2,999,600	2,318,400	340
Peter Wando	115,400	456,200	340,800	295
Pedro Frances	723,800	936,200	212,400	29
Rosina Basil	309,900	-322,200	-632,100	-204

The individual farmers' production of staple crops



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Rosina Basil

Rosina lives with her elderly husband in a small house on the upper plain, 3 km from the nearest tap. She is a kind and warm hearted woman who seems to never sit still. Her cheery disposition changed rapidly when we talked about the previous year. She had planted in December 2014 and January 2015 and her crops were doing well, they were 5-foot-tall when the rains did not arrive and the heat intensified. It broke her heart to watch them slowly wither and die. She said if they had been planted later and were just 3-foot-tall when the rains failed then maybe they would have survived and produced a harvest. Luck, she says, played a very big part, “some farmers still had a harvest but many lost everything....this February has been much better as you can see from the maize around us but it has been 3 days since the (light) rains came and if it does not arrive soon more maize might be lost this year for some farmers. I am lucky this year because my maize is already mature, it still needs to dry but I am confident I will get 100% of my crop”. [A few days’ later big rains arrived – we are yet to see if this has impacted on her crop]

Rosina gets milk from a goat; she had hoped for 8 months of milk but got only 4 because the goat fell pregnant again. The kid she has she hopes will produce milk in June, which she will need because the newly pregnant mother goat died from a snake bite. She sold her other goat she had to cover her cash flow problems.

Rosina has grown vegetables such as carrots, tomatoes, and assorted greens, but this is for family consumption. She would like to scale up but the problem is water, 3km is too far to be walking back and forth to all day, she does 2 trips already for domestic needs.

Rosina has planted cassava, again, mostly for home consumption but she has sold some and will sell more in 2016.

Rosina has 3 pomegranate trees, one is mature and produces fruit and she hopes to see it generate TSH 5000, the other 2 trees ought to produce fruit next year. Rosina’s avocado tree is straining with fruit, her orange/lemon tree is doing well (a result of budding) and the papaya and banana trees will provide fruit this year. The timber trees she planted last year are 15-foot-tall already and she plans to plant more – this is for selling in the community.

Rosina has excelled in her intercropping with cassava, beans, chillies, tomatoes and fruit trees.

Rosina made a loss of TSH 322,000 on her staples this year but because of her diversification she was able to still make a profit, albeit a small one from her agricultural activities. She has supplemented her life this year through her successful door to door selling of bananas.



Other staples

While last year no one was growing beans, this year 56% of the farmers added standard beans to their portfolio. The beans had a target gross profit (GP) of 84% and achieved a respectable 74%, generating a collective profit of TSH 3.82 million and averaging TSH 273,000 per farmer.

44% of the farmers added black eyed beans to their repertoire and these beans had a target GP of 77% and actually achieved 86% with a collective profit of TSH 3.36 million, averaging TSH 305,000 per farmer.

Only 8% of farmers grew cassava which provided a steady income throughout the year and generated a collective profit of TSH 223,000, averaging TSH 111,500 per farmer. Cassava can be propagated and so there were no costs. Some however have suggested that cassava can take up a lot of space for the income it generates and so is not so profitable while others say that moles known locally as “Fuko” eat the roots. It was also suggested that fields of cassava might attract thieves who could take a whole crop at night. This was a very sad reflection of the impact of a growing Babati.

Across the board 72% of the farmers grew at least one of these crops, thus improving their income security prospects.

Vegetables

Growing vegetables can be highly profitable but it does require significant water, which for some is a prohibiting factor. Across the board 76% of the farmers opted to grow one or more vegetables for market to help diversify their income. While we had hoped that this would be higher it is important to note that some farmers grew vegetables on a small scale for home consumption due to the long distances to water and had they been closer to a water source they would have grown vegetables.

In the previous year the growing of tomatoes was a major success within the community which created an unreasonable expectation for this year of huge profits (TSH 27,830,500) with an 87% gross profit forecast. In reality the harvest generated a profit of TSH 2,196,300 with a gross profit of 51%. The poor gross profit margins reflect the extent of the failure of the tomato crop. Of the 19 farmers who had planned to grow tomatoes only 18 farmers actually did and they collectively planted only a third of the tomatoes planned because of the weather. Only 13 farmers generated a crop and only 7 made a profit. Those farmers who had planted tomatoes on a large scale found their crops being infested with insects, reducing the quality of the produce and prohibiting sales. On examining the fields we saw that the lessons on organic pest control were not being implemented.

	Planned Profit 2014	Actual Profit 2014	Planned Profit 2015	Actual Profit 2015	Planned Profit 2016
Tomatoes	5,896,500	5,317,500	27,830,500	2,196,300	15,734,500

The average profit made by those who did make a profit was TSH 394,000, while the average loss made was TSH 27,000. This is by all accounts a disastrous year for the majority of the tomato growers and due consideration is needed for 2016 to avoid this problem reoccurring especially as the planned profits are still extremely significant.





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Pepper growing, like tomato growing, also requires water and 3 of the 4 farmers who planned to plant peppers did so but only 2 made an income from it. The income was small at TSH 46,000 each but it still managed to achieve a gross profit of 59% which makes the exercise worthwhile and contributes to improved cash flow. It is surprising therefore that only one farmer is planning to grow peppers in 2016. The low selling price of TSH 100 per pepper is perhaps too small a return for the effort of size of land the plant takes up.

	Planned Profit 2014	Actual Profit 2014	Planned Profit 2015	Actual Profit 2015	Planned Profit 2016
Peppers	580,500	495,000	851,000	36,000	42,000

One man was going to plant onions this year and expected to make a profit of TSH 21,000,000 but he did not plant them because the selling price of onions dropped significantly and the profits he planned were no longer available. While this was disappointing it did highlight that this farmer is keeping a close eye on the market prices and using that data to determine his farming activities. No farmers have plans to grow onions in 2016, but this may change if the market improves.

6 farmers planned to grow "greens" for market such as Sukumaweki, Mnafu, Mchicha and Chinese leaf, but only 2 did so and they generated a profit of TSH 302,000 between them with a gross profit margin of 99.6%, so it was a highly profitable activity. Most of the farmers were only growing greens for home consumption, referring to it as their wife's project and 2 wives made a surplus which they sold for TSH 6,000 each. 6 farmers again are planning to grow greens in 2016. This is a reflection of the water issues that face farmers; these green leafy vegetables require daily watering, this is a burden and the potential profit does not appear to be motivation.

	Planned Profit 2014	Actual Profit 2014	Planned Profit 2015	Actual Profit 2015	Planned Profit 2016
Greens	285,000	311,500	314,000	302,000	366,800

Trees

The growing of fruit for cash used to be confined to bananas but this is now the fastest growing area for farmers. Trees planted 3+ years ago are starting to mature. Fruit has always been grown for home consumption but as Babati grows the local market for fruit is rapidly expanding.

One farmer is growing pomegranates and with increasing yields she expects to sell in 2016. Papayas generated TSH 40,000 for one family, while mangoes generated an income of 80,000 for another farmer. There are 4 farmers producing avocados for market and they generated an average profit of TSH 65,000. More trees have been planted and there are expectations of larger profit in 2016 and beyond. There are 4 farmers producing bananas for market and they generate an average profit of TSH 75,000.



	Planned Profit 2014	Actual Profit 2014	Planned Profit 2015	Actual Profit 2015	Planned Profit 2016
Fruit	180,000	180,000	240,000	679,000	1,801,000

One farmer is also growing timber trees and these trees have grown over 10ft in one year!

Milk

Milk sales were marginally higher than the previous year. The previous year 7 farmers had dairy cows providing milk for market while this year there were 11 farmers with dairy cows producing milk for the market with the added bonus that some farmers were able to sell at TSH 1,000 a litre as opposed to TSH 700 per litre that most farmers received. The more expensive milk was sold directly in Babati and arguably incurred some travel costs, but could only realistically be sold by those producing larger amounts. Households with only 3-5 litres a day are restricted to selling locally or to middlemen who then sold in Babati. The milk provided a vital and regular source of income at a time when income for those farmers was scarce. The recording of cow costs



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has improved from 2014 where there was very little attributed to caring for cows. In 2016 only 6 farmers are expecting to get milk, this is due to pregnancy cycles.

	Planned Profit 2014	Actual Profit 2014	Planned Profit 2015	Actual Profit 2015	Planned Profit 2016
Milk	3,486,500	3,821,400	5,090,800	4,128,000	5,486,500

Other income sources

In addition to the agricultural income 4 farmers had to sell some of their assets to make ends meet - one goat was sold for 80,000, a duck for 10,000, 2 cows for a combined total of 1,700,000. The fisherman in the community caught and sold fish to the value of TSH 620,000.

By diversifying their crops as we can see in the chart below farmers are able to spread the risk and even cover one failed crop with the successes of another but only two farmers were successful in that strategy and the others farmers need to improve their diversity

	Staples	Other Staples	Tomatoes	Peppers	Greens	Fruit	Milk	Other income	TOTAL
Elizabeth Msuya	P	P			P		P		P
Christina Lucian	P								P
Daudi Hamis	L	P	P		P	P	P		P
Elizabeth Lala	P	P				P	P		P
Adbi Issa Fulla	P		P						P
Constantino Dagharo	P	P					P	P	P
Emanuel Barhe	P	P	P				P	P	P
Felister Iddi	L	P							L
Habibu Ingi	P	P	L				P		P
Hamis Mambalala	P	P				P		P	P
Iddi Ducta	P				P		P		P
Isadori Kashmiri	P	P				P			P
Josephine Joseph	L								L
Juma Alley Imbisha	P	P							P
Juma Hussein	P	P	L						P
Juma Ragabu	P	P		L			P	p	P
Mateo Barhe	P	P	L						P
Mohammed Akonaay	L	P	P						L
Musa Bura	L		L						L
Nduguru Ngaima	P		P			P			P
Omary Ducta	P	p					P		P
Paulo Kundasi	P	p	P	P			P		P
Peter Wando	P	p	P			P			P
Pedro Frances	P	p	P					P	P
Rosina Basil	L	p		P	P	P	P		P

P = Profit L = Loss



Fellister Iddi's home before the floods

Fellister Iddi is an incredibly resilient woman. As one of the original 25 farmers she is involved in the out-farmers training programme despite having less than half an acre to her name, no electricity and no local access to water. Fellister had an exceptionally difficult 2015 and start to 2016, her crops were badly affected by the droughts last year, and she made a loss of TSH 57,600, down from a profit the previous year of TSH 168,700. Added to this the rains in 2016, which resulted in flooding in parts of Tanzania flooded her home and made it uninhabitable causing her to move into rented accommodation, an added strain on her already restricted household purse. Her farming land is also very small and so she rents land down beside the lake. Despite this hardship and the evident impact it's having on her spirits Fellister remains optimistic and as resourceful as ever. She not only grows crops but also looks for ways to add value to what she produces before she sells it. With her cassava for example she is planning to roast each root before it is sold to the public, adding approximately TSH 3,000 to the price she can expect to sell at. Outside of agriculture Fellister also got involved in buying and selling clothes and setting up a small chapatti business to make ends meet during the drought of 2015. Fellister has now gathered the initial materials she needs to start re-building her home and is planning on a slight expansion to give herself some more space. Diversifying her crops into vegetables is not possible without access to water.

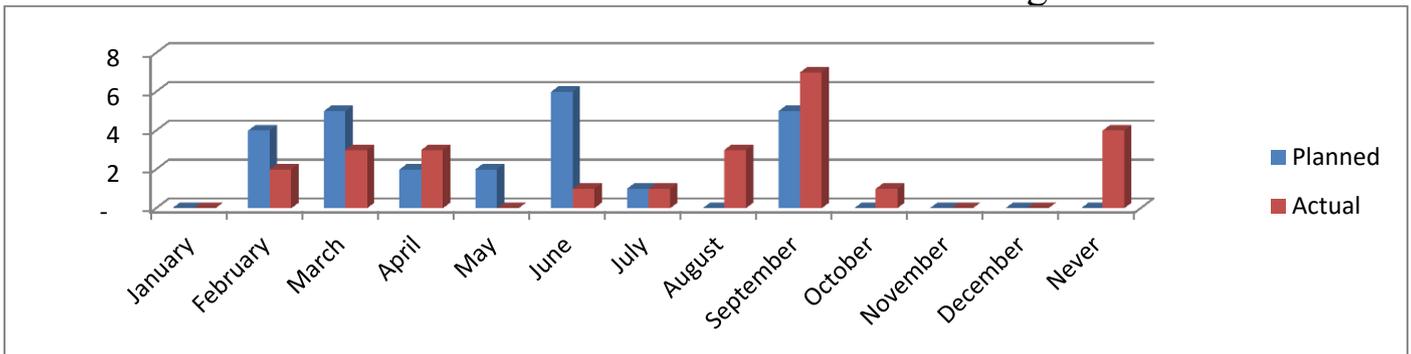
Cash Flow

We have explained the concept of cash flow to the farmers and the importance of planning agricultural activities to ensure that their agri-business is on the red for as short a time as possible. It is important to note that this is not the cash flow of the household and only of the business. Many of the farmers are engaged in activities that are outside this remit¹.

¹ One farmers seeing the poor weather as a problem rented land in Magugu (25km to the north) and three went to Gallapo (15km to the east) where the land is cheaper and there is a water source and they were able to apply their skills there. They have not declared their income in this analysis.



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The cash flow analysis indicates that those who diversified their income streams were in profit much earlier than those that did not. Some farmers had their agricultural businesses in profit as early as February, by planting crops in November/December. It is sad to see that the planned activities were not realised but we now understand why that might be. The analysis also indicates that 4 farmers made a loss across the board with their activities². It is worth noting that none of these farmers have a dairy cow, none sold assets to improve cash flow but not all had zero diversification – one grew a small amount of cassava, one grew black eyed beans, 2 successfully grew tomatoes while one failed to grow tomatoes. Their cash flow concerns were entirely related to losses on the staples and that 3 of the 4 had rented the land on which they made a loss.

Saving and Loans Scheme

The farmers are still fully engaged with this programme and value it very much. 100% of the farmers repaid in full and on time and the loans were subsequently reissued. All fully understand that by December 2017 the loan programme ends and that in order for the scheme to be sustainable going forward they must start to contribute their savings to it. However the poor harvests resulted in no one been able to make that contribution but all promised to double their contribution this year to bring the programme back on track. No consideration has yet been made by the group as to how to deal with the expanding group size and the complications that it may create nor their role within it. This will be discussed later in the year.

² It is important to note here that one of the farmers invested heavily in tomatoes in November and is expecting a harvest in January/February 2016 and so his negative cash flow is as a direct result of this investment



2. 50 New Farmers

In scaling up the programme from the pilot stage it was felt important that the trained farmers share their knowledge and skills with their neighbours over the next 4-5 years until as many as want it have been given the opportunity to be trained. In this way each farmer is required to train and mentor 2 farmers a year from within the community. Each farmer has been allocated their trainees based on proximity and a desire to learn and it was left for them as a group to arrange the training schedule at times that suited them. In addition, collective training was organised at the demonstration plot where all could actively participate in maize and pigeon pea spacing training and planting under the added supervision of Mr Marceli from MCDO.

Peer to peer training is not without its limitations but if we are to empower the trainers with ownership of the process we must allow them to participate in the process of learning from their mistakes rather than being told what to do from the outset. This is part of the ethos of participatory development in that the farmers and those they are training must work together to ensure that success is achieved with as little external influence as possible. However, we did recognise the limitations of having only one perspective in their training and so we have opted to offer individuals the opportunity to learn from multiple sources by visiting training centres run by other NGO's on condition that they then share what they have experienced.

At our first review meeting in February, and after one to one interviews with some of the trainers it became apparent that the training being provided lacked uniformity and consistency. Different farmers were passing on knowledge about areas that they were interested in and not on areas that they were not so interested or confident in. This suggests that the farmers are perhaps not best placed to provide all the training. While some of the new farmers were happy with the progress being made others were not. At two separate meetings with the Trainers and the Trainees we discussed the trainees' expectations of what they will be taught and what the trainers thought they should teach and there were some interesting differences. The list of trainee expectations has been sent back to the trainers to ensure that, where practicable, they can be included.

The training must include: composting, contour farming, organic pest control, vegetable growing, bag, keyhole and raised bed gardens, spacing of seeds especially for maize production, entrepreneurship, nutrition and nutritional training, environmental education and tree nurseries for fruit, timber, firewood trees and Moringa bushes. In addition, it ought to provide where practicable animal husbandry.

This process of on-going reviews is helpful for the trainers so that they can gain clear understandings of what the trainees expect from them and can motivate them to ensure that they achieve this and take pride in what they are achieving. There will always be hiccups but close collaboration will help iron them out. It is also clear that Mr Marceli needs to take a more active role than we had envisaged so that areas where the trainers are not confident can be addressed so that in year 2 the farmers can work with less supervision from Mr Marceli. The immediate assistance will be provided by the soon to be appointed extension officer John Martin (see Section3).



Some of the new farmers at the group meeting



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When we review the agricultural expectations for the new farmers³ we can see that they are all planning to plant the staple crops but less than half have an effective back up plan with alternative staple crops. There are too few growing fruit trees (of those growing fruit, 5 farmers have only one type of tree, 3 farmers have 2 types and only 1 farmer has 3 types) and greens which we hope the nutrition workshop will address (data collected before workshop). The data (not shown) also indicates a wide divergence of anticipated selling prices; this will for many result in increased and unrealistic anticipated income figures. For example, Pigeon pea prices per 100kg sack are hoped to sell for between TSH 70,000 to 260,000 with an average price of TSH120,000, while the prices for maize ranges from TSH 30,000 to 70,000 with an average of TSH45,000. Some will get more than they hoped for while others will be disappointed.

The planned agricultural activity data, which was collected before the training, provides a good baseline and helps us to measure progress and understand the number of people diversifying their activities. It is worth noting that we would not expect huge changes in the first year, but would hope to see changes in their plans for year 2. Similar to the original 25 farmers their expectations are enthusiastic. A large number of farmers are banking on the tomatoes to provide them with a good income but it is also a risky crop until the pest controls have been put in place.

Crop	No of farmers planning to grow the crop	Planned average profit per farm	Planned GP%
Staples (Maize and pigeon peas)	47	1,329,570	78
Cassava	2	400,000	100
Potatoes	1	240,000	100
Millet	1	67,000	96
Beans	19	316,689	80
Black beans	4	241,400	62
Sunflowers	1	400,000	100
Carrots	1	60,000	67
Tomatoes	13	919,923	98
Peppers	1	491,000	98
Greens	15	59,000	76
Milk	4	650,250	
Papaya/Pawpaw	5	22,600	
Avocadoes	4	41,200	
Mangoes	4	58,750	
Bananas	6	42,500	

Demonstration Plot

When the land at the local school was no longer available for the farmers, it was necessary to buy a plot of land where the farmers could demonstrate farming techniques and train new farmers while collectively earn some extra money for the group to share. The land was purchased in the dry season and it was agreed within the group to start with maize and pigeon peas for 75% of the land and use 25% for growing vegetables.

The team investigated drip irrigation and collectively concluded that an investment of this amount was not in their best interests at this time and that a diesel water pump and hose pipes would be just as effective.

The trainee farmers have been involved in the planting of the maize and peas and learnt about spacing and planting techniques.

The land will be a useful asset to the group and will continue to provide training over the years.

³ We have to date only 47 of the 50 agricultural plans for 2016



Demonstration plot on the left

Health Seminar

Part of the training the farmers received was a 2-day health workshop in the local primary school. During the day they learnt about digestion, nutrition, where the nutrients come from; what constitutes a balanced diet and what the health implications are for men, women, pregnant women, babies, young children and teenagers. This training focuses on providing the understanding of the need for fruit and vegetables in the diet and therefore provides motivation for the farmers to grow and eat them and by so doing improve the health of the family.

In addition the training focuses on hygiene; bacteria, their transference from place to place and what happens if they get into the body. Particularly there is a focus in diarrhoea, its causes, prevention and how to treat a person with it. By being able to treat yourself or your child at home one is able to save time and money by not having to go to hospital 12km away.

The need for hygiene awareness emanates from the baseline survey which highlighted a lack of understanding. The training was well received by the farmers.



Farmers back to school



Farmers learning about the tippi-tippi hands free hand washing

3. Sponsored Student

John Martin is the young man from Managhat who is being sponsored to study “Livestock Management and Agriculture for Livestock” at the Bacho Agricultural Institute. He is in his second year, and will take his final exams in October/November after a summer placement.

In his exams at the end of last year he achieved 9 A grades, 4 B grades and 2 C grades (Life Skills and English). His overall grade was a Credit and the course tutor says he is “Excellent”. Under a surprise interview he was confident and knowledgeable and his 10 year vision is to bring about “visible changes in the community”. We look forward to welcoming him to the team later this year and have started to develop plans as to how to utilise his skills.



John Martin



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4. Data collection

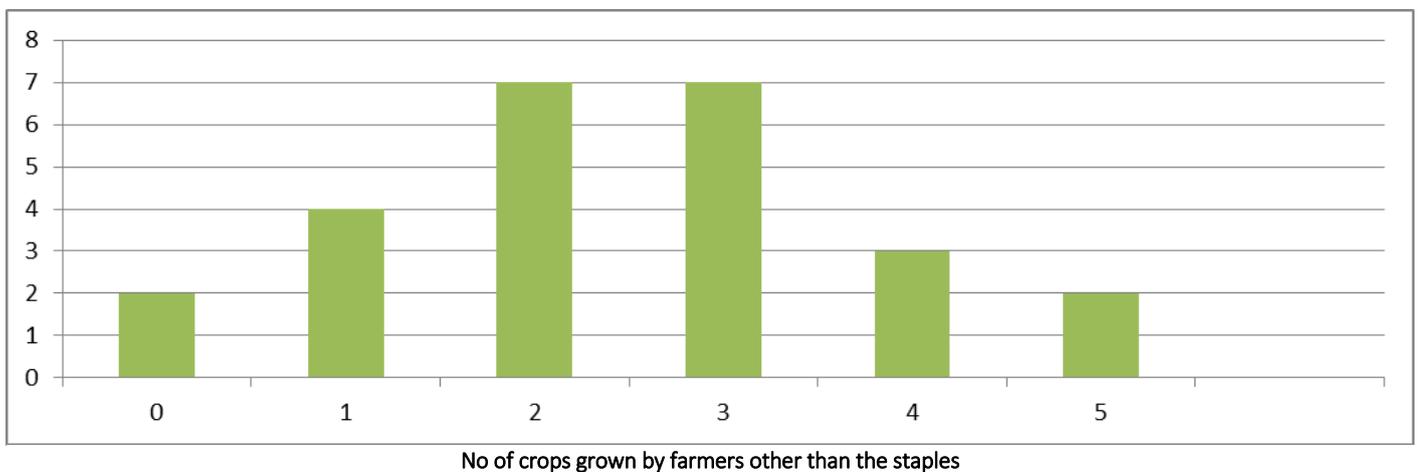
We currently collect all the planned and actual data for each crop that the farmers planned to grow and actually grow. This data is input onto their own personal sheets that can provide analysis of their planned and actual cash flows. To compare to other farmers this data is then transferred manually to a separate sheet so that we can identify trends and patterns. This is time consuming with 25 farmers but with 50 year on year is going to be incredibly time consuming.



Conclusions

Despite hiccups caused by the weather and insects the project continues to be successful and welcomed by the community. However, the positive results were unevenly experienced across the community so there is still much work to be done.

The weather is becoming less and less predictable and this is hampering the farmers' ability to successfully secure food and income security. It is clear that those with the greatest diversity of crops have more resilience and the graph below summarises just how many of the 25 farmers are growing additional crops. Two farmers are entirely dependent on their staple crop while two farmers have 5 other sources of income. One ought not to assume that this is through lack of desire to diversify, it may be due to a lack of land or resources or the distance to a water source. Indeed, access to water as opposed to knowledge is now the greatest factor that is preventing farmers from reaching their potential.



It was also clear that the organic pest control that was taught is not being implemented. Last year we were told the farmers did not want to plant grasses and other organic pest control plants on land that did not belong to them. However, one farmer revealed that despite being taught organic pest control it was not clearly demonstrated to them. This suggests that there is still a certain need for spoon-feeding and that seeing is still very much needed as a tool. This will be addressed at the new demonstration plot.

Part of the most successful diversification is the fruit. Trees need very little on-going maintenance once they are well established and can provide a useful income suggesting that money does indeed grow on trees. It seems that the tree saplings are not being grown at home and that success emanated from the tree nursery at the local school. The nursery needs to be re-established and not just for fruit but timber and firewood trees as well.

The production of milk for many has been a vital contribution and at least one farmer was kept from making a loss because of it. Milk production is not so dependent on the timings of the weather and so the milk is a secure source of income. In addition, the manure adds to the soil fertility, so overall the milk is a winner.

The improved diversification of income streams clearly gives the household better cash flow to manage their lives with. And as time progresses, and with good harvests at the right times, people will be better placed to save and spend on improving their standard of living.

Talking with the farmers at meetings and 1-to-1 interviews it is clear that they are still hugely motivated by the project, not just for the knowledge, loans and potential income but also for the strength and comradery that they gain through being part of the group. The forum they have, with meetings each week, provides them with a support network that has been life changing.



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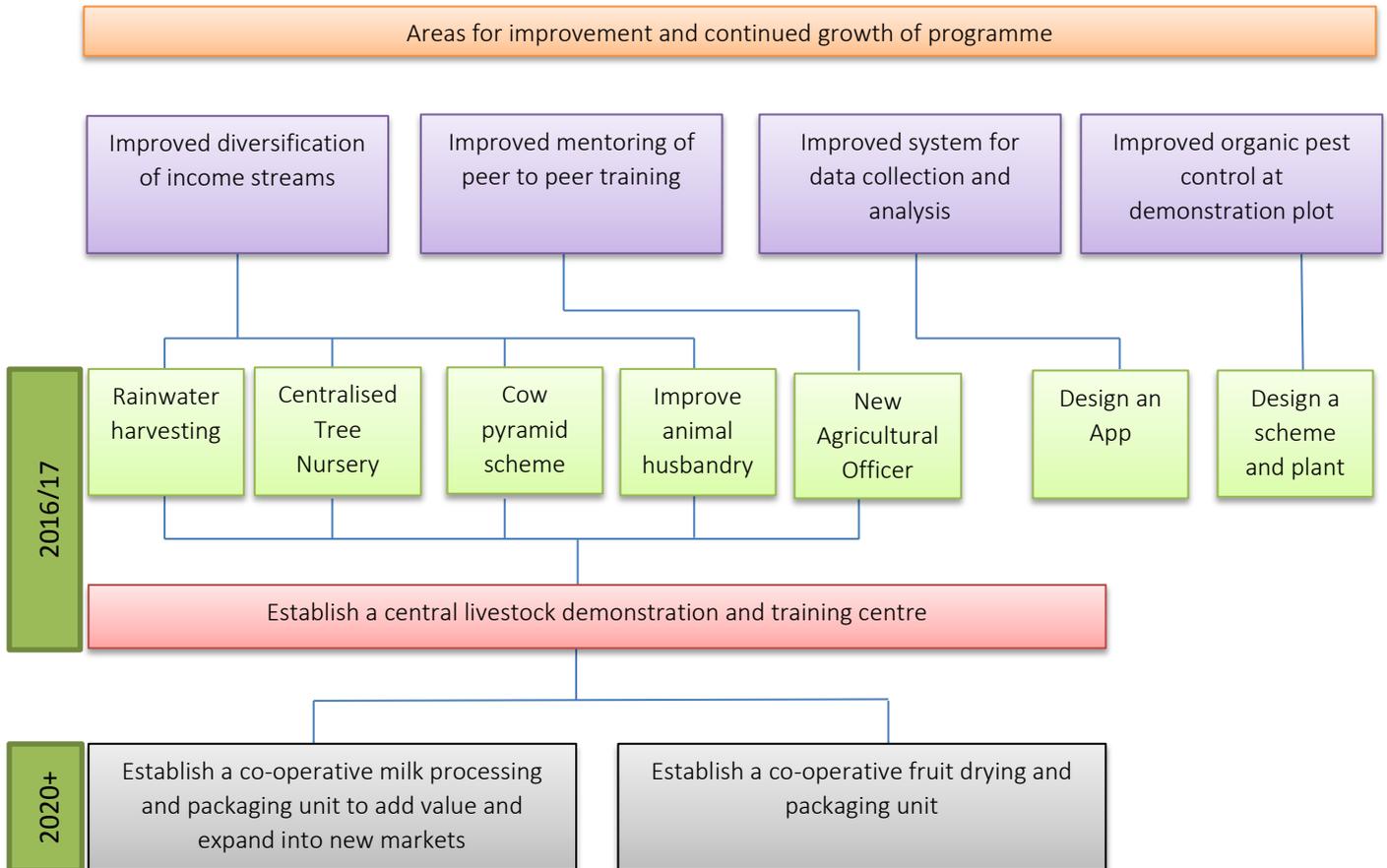
It is great to see the John Martin studying hard at the Agricultural College and LTT have to plan for his future and how best to utilize his skills for the benefit of the community.

It was perhaps not clear just how stretched MCDO have been since July. They have been able to undertake simple data collection and routine tasks but they have been unable to review the information that is gathered or make helpful recommendations based on it. We are fortunate that we have on trial a new member of staff with the skills we have been seeking who has taken over the community development side of our work and we are looking forward to him settling in and working closely with the farmers.

It is also clear that, as the number of farmers grows, the data that needs to be collected and analysed will also grow. This is a time consuming process which hampers our ability to react quickly to events and themes.



Plans for 2016/17 and onwards



The purpose of a formal review process is to assist LTT/MCDO to identify areas of success and understand why, as well as how, success has been achieved. It is also essential in identifying areas that need to be improved upon and adjusted to ensure that the project achieves the greatest benefit for the participants. Reviewing is also a chance to report back to the community on the project, the way we are working together, and to discuss any issues, themes and ideas that have been raised; as well as to provide the donor with details of what is going on and how their funds are bringing about the desired long term changes. This report will therefore be shared with all stakeholders.

The Livingstone Tanzania Trust’s vision for the Managhat community is to empower the local community to meet and exceed their basic needs, improve their standard of living and escape from poverty on a sustainable and long term basis. This vision cannot be realised overnight but can be gradually achieved over a period of time, by building the skills, capacity and resources within the community to enable them not just to create a product but also to add value to it and take it to market.

The above chart represents a basic roadmap to achieve this goal and identifies some of the steps that are needed on the way and shows how important the first stages of the development are in achieving the long term goals.

The vision focuses on two demonstration plots.

- ❶ An agricultural demonstration plot is in place and running. It needs to improve its demonstration of organic pest control through strategic planting but it is already providing training for new farmers from within the community.
- ❷ The livestock demonstration plot needs to be established. This plot would demonstrate:-



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- Best practice for accommodating livestock to ensure good health
- What grasses and other fodder ought to be grown to ensure good health and good milk yields
- Bag and lined raised bed gardens⁴ for small scale vegetable growing
- Best practice for manure and compost making and storage

In addition, the centre would provide accommodation for the new community extension officer and space for community training and consultation. Through close access to this resource the community can consult the officer about disease prevention, diagnosis and treatment.

There is a strong desire from within the community to establish a dairy cow pyramid scheme which, from an initial investment of 10 dairy cows, has the potential to grow to a population of over 90 cows in 10-12 years. To manage the health and well-being of the cows LTT want to delay this programme until the above demonstration centre is in place so that the local farmers can learn the right way to care for the cows BEFORE they get them.

As this programme progresses the projections suggest that the supply of milk will eventually exceed the local demand and additional markets will need to be found. To date we have identified 3 paths that can be taken: (1) the farmers could sell to a middle-man; (2) they could join existing milk co-operatives; or (3) establish their own co-operative and process, package, chill and transport their milk themselves. Value can also be added by making yoghurt and other dairy products. The decision for this does not need to be taken for at least 3-4 years so there is time to plan.

The livestock plot can also accommodate a tree nursery and supply farmers with saplings as needed and can even provide saplings that have had other varieties grafted onto them. However, what is important here is that the variety of the trees, especially the mango trees, are selected as suitable for fruit drying, as in 4-5 years' time the supply of mangoes might be sufficient to consider adding value to the crop by establishing a co-operatively managed drying and packaging facility. Centralising the growing of saplings therefore becomes more advantageous than encouraging farmers to grow their own.

The report highlights the key importance of crop diversification to balance the risk of poor rains, regulate cash flow and provide greater income security. For some farmers this is currently not possible due to lack of access to water. For those farmers a domestic rainwater harvesting system is a necessary tool to enable them utilise their knowledge and establish bag gardens and lined, raised bed gardens. We are running a pilot project in the Mroki Community targeting urban edible gardens and this has so far been very successful. We intend to take some of the farmers from Managhat to visit the pilot project and if needs be offer them support.

It is also clear that the farmers have different sizes of land that they own and rent and different levels of domestic resource. What LTT seeks to do via the roadmap is to provide long term, *bespoke* support to the farmers. Not all farmers are able to be involved in the cow pyramid scheme as individuals but maybe they are able to participate in pairs or small teams. Not all farmers struggle with water issues to the same extent, so those with the greatest needs need are to be given priority support. In this way we strive to create equality of access to our Agriculture Programme, regardless of differing individual situations.

The Programme cannot continue to demonstrate its successes without an improved measuring tool, with growing numbers of farmers participating the use of Excel to record data is increasingly onerous and prone to human error. LTT will therefore be seeking to work with volunteers where possible to design and create an App that can be used in the field via a tablet/mobile phone and can capture data instantaneously to ease the collection and analysis process. An investment in appropriate technology for this task will save hours of work in the future, freeing up MCDO time to concentrate on delivery of a portfolio of other projects and reducing the percentage of time spent on administering data for the Programme in the UK.

⁴ A lined raised bed garden is a one that has a plastic lining under it to prevent water soaking away into the ground and therefore reducing the need to collect so much.