

ANNUAL HOUSEHOLD SURVEY REPORT



Acknowledgements

The authors would like to sincerely thank various personnel from Musika Partner Firms (MPFs) for the support given during the process of carrying out this survey. The information collected provides essential feedback on how improved agricultural markets have had an effect on smallholder farmers. Many thanks also go to the Musika staff and enumerators who undertook the fieldwork.

Executive Summary

The Annual Household Survey (AHS), is primarily conducted to test the validity of Musika's theory of change for generating impact at household level, on an annual basis. The data from the survey is presented in a descriptive format, and helps to offer insights on what the potential effect of Musika's interventions have been at household-level. It also offers lessons in areas where Musika requires making improvements. The 2018 AHS covered six (6) Provinces (Southern, Northern, Muchinga, Luapula, Central, Lusaka) and three (3) thematic areas: Environment, Business and Finance, and Agricultural Diversification. The survey involved interviews with farmers from firms supported by Musika (participant group), and farmers with no linkages with Musika firms (non-participant group) with reference to the 2017/2018 agricultural season. The survey captured 911 smallholder farmers across the 6 provinces. Farmers engaged with Musika clients are regarded as improved market participants¹. Thus improved markets do not only offer farmers market opportunities but also include the provision of other services that provide both the knowledge and confidence for farmers to maximize the market opportunity. Below were the key highlights from the study;

- Generally, the findings from the AHS did conform to what the theory of change stipulates. There were notable differences between the participant group (farmers linked to Musika supported firms) and farmers who were not associated with Musika firms. The participant group noted higher changes in technical information access, better adoption rates of technologies, higher rates of productivity and incomes than the no-participant group.
- The study revealed that more farmers from the participant group received technical information in comparison to the non-participant group. For instance, more farmers participating in improved markets received agronomic extension information (85%) than farmers from the non-participant group (15%). Moreover, 54% of the farmers in the participant group indicated that they received price information as part of their transactions with agribusinesses compared to 29% in the non-participant group. Furthermore, it was found that 57% of livestock farmers in the participant group received technical information on veterinary drugs/products and services compared to 4% of the farmers from the non-participant group. The study further revealed that 26% of the livestock farmers in the participant group excellently understood the information given by Musika partner firms compared to 3% of the farmers from the non-participant group. In terms of agro-chemicals, the research found that 40% of the households from the participant group indicated that they received agronomic information from agro-chemical suppliers whereas only 24% from the non-participant received such information.
- The majority of the farmers in the participant group (74%) stated that they were very confident in investing in their own production compared to 32% of the farmers in non-participant group.

¹ These are farmers who access market products and services with the integration into the transaction of other 'value added' services such as extension and information delivery, technology transfer, assured access to off-take markets, contracts, access to price information, facilitation of access to finance, etc.

- Generally, the study found that there was a higher number of farmers indicating use of improved seed in the participant group (22%) than the non-participant group (5%). Use of improved seed was lower when maize was not included in the calculations as 13% of the farmers used improved seed whilst only 2% used improved seed in the non-participant group.
- The study also found that use of agrochemicals was higher in the participant group (25%) than in the non-participant group (17%). Additionally, the study showed that 62% of the farmers from the participant group purchased veterinary drugs and services compared to 11% in the comparison group. The higher uptake of technologies by the participant group could be as a result of participant farmers observing a higher increase in the number of agricultural product and service providers than non-participant farmers. For instance, it was found that 53% of livestock farmers observed an increase in product and service providers compared to 29% of the farmers in the non-participant group. A similar trend was noted for farmers involved in crop production as 49% of the farmers observed an increase in agricultural product and service providers compared to 27% of farmers in the non-participant group.
- Productivity (crop yield per hectare) and calving rate (cattle calving efficiency) was found to be higher amongst farmers in the participant group than in the non-participant group. For instance, improved markets-linked farmers had better yields by 46%, on average, than farmers without improved market linkages. This posits improved markets as conduits for enhancing agricultural productivity. Moreover, 39% of the farmers from the participant group stated that their crop production increased the past agricultural season (2017/18) compared to 7% of the farmers from the non-participant group. Over the past year, 67% of the farmers linked to improved markets stated that their herd size (number of cattle) increased in comparison to 41% of the farmers in the non-participant group. The better calving rates observed by the farmers linked to improved markets could be attributed to services accessed such as drugs and veterinary services.
- The study found that 47% of the households in the participant group sold crops compared to 11% of the households from the non-participant group, representing a 36% difference in favour of improved market-linked farmers. Furthermore, 19% of the households from the participant group noted an increase in the amount of crop sold over the past 2017/18 agricultural season compared to 4% of the households from the participant group. And for households that kept livestock, 44% sold livestock in the participant group compared to only 8% from the non-participant group.
- While farmers in both the participant and non-participant group stated that their income increased, the study found that 67% of the farmers with market linkages perceived an increase in their income over the past agricultural season compared to 51% in the non-participant group. This suggests that access to improved market leads to farmers realising a financial benefit. On average, ZMW2,712 was generated by farmers in the non-participant group whilst farmers in the participant group obtained ZMW6,492 from selling of agricultural produce. Thus the participant group generated twice the amount of money made by the farmers in non-participant group.

- In terms of food security, the study found that there were more farmers (66%) with improved market linkages stating household food adequacy provisions over the past year than farmers (53%) from the non-participant group.

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Table 2. 1: Demographic characteristics

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ABBREVIATIONS AND ACRONYMS

AHS	Annual Household Survey
CSO	Central Statistical Office
HH	Household
KG	Kilogram
Km	Kilometre
MPF	Musika Partner Firm
MSP	Mechanisation Service Provider
RAF	Results Assessment Framework
RALS	Rural Agricultural Livelihoods Survey
ZMW	Zambian Kwacha

1.0 Introduction

1.1 Background

Musika started facilitating the establishment of mutually beneficial commercial relationships between the private sector and the rural smallholder farmers in 2012. Over the years, it expanded its activities to various sectors of the economy reaching almost all regions of the country.

Because Musika is interested in knowing the impact of its activities on the rural poor, it came up with key indicators of change, which are contained in its Results Assessment Framework (RAF). Musika tracks these indicators using various results measurement processes. Musika uses a mixed method approach to assess its impact on rural communities, the approach involves both experimental (‘quantitative’) and non-experimental (‘qualitative’) approaches to impact evaluation. The experimental approach is used to measure the impact of Musika at farmer level, on indicators such as income, production, productivity among others. This type of evaluation is by design ideally conducted every after two years, and Musika uses data from the Rural Agricultural Livelihood Survey (RALS). The biennial impact evaluation (RALS data) generates information from a suitable nationally representative panel sample of farmers, which is collected via credible procedures grounded in rigorous scientific approaches. Two evaluations have so far been done: 2012 and 2015. The next RALS is scheduled to be conducted mid-2019, and consequently, Musika would be conducting its next quantitative impact assessment during the same year.

On the other hand, the ‘qualitative’ impact evaluation, termed the Musika Annual Household Survey (AHS), is primarily conducted to test the validity of Musika’s theory of change for generating impact at household level, on an annual basis. The theory of change for the interventions could be described as follows:



Musika conducted the AHS in 2018, and the study sought to test Musika’s theory of change for various markets under the new thematic areas of interest with reference to the 2017/2018 agricultural year. This survey aimed at assessing the behavioural change and social impact that

various Musika interventions have had on farming households. Therefore, data was collected on farmer perceptions to derive household level descriptive statistics that helped to highlight the changes that occurred at different stages in the theory of change outlined above.

1.2 Specific Objectives

The Specific Objectives were as follows:

- Assess changes in the number of additional improved markets to which farmers have access (including both market opportunities themselves and points of access within those markets).
- Determine the change regarding the extent to which farmers have access to price and technical information in the various markets.
- Examine the change in farmers' understanding of technical information and behaviour change as a result of receiving that information and/or accessing 'improved' markets (adoption of new technologies, new cropping/livestock systems, new husbandry practices, etc.)
- Examine the change in the levels of farmers' confidence to make investments in their farming businesses.
- Determine the change in farmers' level of investment in their farming business and participation in markets.
- Assess farmers' perceptions of the impact of Musika's interventions on their production, productivity and income.
- Determine the changes in farmer investment in education, health and household food provisions.
- Assess the change in gender and child labour dynamics in relation to labour requirements for agricultural production.
- Assess changes in the number of farmers adopting or practicing different agricultural activities.
- Examine changes in farmers practicing climate smart agriculture.
- Determine the change in the proportion of farmers using agrochemicals.
- Examine changes in farmers' perception of safe use of chemicals.
- Assess the change in the proportion of farmers clearing new land for farming.
- Examine the change in the number of farmers using irrigation facilities.
- Assess the change in the number of farmers using clean and efficient cooking energies.
- Examine changes in gender related intra-household control over economic decisions.
- Assess the change in financial inclusion as a result of Musika interventions.

1.3 Methodology

The 2018 AHS used a quasi-experimental design to collect data from sampled households; participant and non-participant households were purposively selected. The participant households were targeted to examine programme participants i.e. farmers engaged with one or more of Musika's corporate agribusiness clients whilst the non-participant group captured non-program participants. Data was collected at household level. A purposive sampling technique

was used to capture a total sample of 911 respondents, which consisted of 76% of the participant households and 24% of the non-participant households. The sample sizes from various Musika interventions were drawn based on proportional to size of the thematic areas.

1.3.1 Thematic Areas Covered

The 2018 AHS survey covered three Musika thematic areas: Business and Finance, Agricultural Diversification, and Environmental Markets. The Business and Finance thematic area focuses on improving the functionality of multiple levels in the agricultural supply chain through building business management capacity, upgrading management systems, integrating digital solutions and improving access to financial products and services for key actors in the agricultural market. On the other hand, Agricultural Diversification focuses on improving the range of production options available to smallholders to enhance income and reduce multiple risks including those presented by climate change. The Environmental Market focuses on stimulating growth in markets that present the opportunity for both inclusive economic growth and climate change mitigation such as clean energy and sustainable natural resource utilization.

2.0 Key Findings

2.1 Demographic characteristics

The study found that the majority of the households interviewed were male headed (86%). However, a comparison of female headed households between the two groups revealed that the non-participant group had more female headed households across all the Provinces than the participant group except for Lusaka Province, see table 2.1 below. Most of the household heads were married, and 80% of the farmers were in monogamous marriage. The average household size was 7 with the highest being 9 recorded in Central and Southern Provinces. The level of education attained by most household heads was primary education; tertiary education was the least attained education level by household heads. Although the proportion of households attaining a higher level of education seemed low, the level of education of the household heads has an impact on the productivity of the farmer (Ferreira, 2018). This has the potential of influencing the ability of the farmers to assimilate information, and apply it in their farming activities.

Table 2. 1: Demographic characteristics

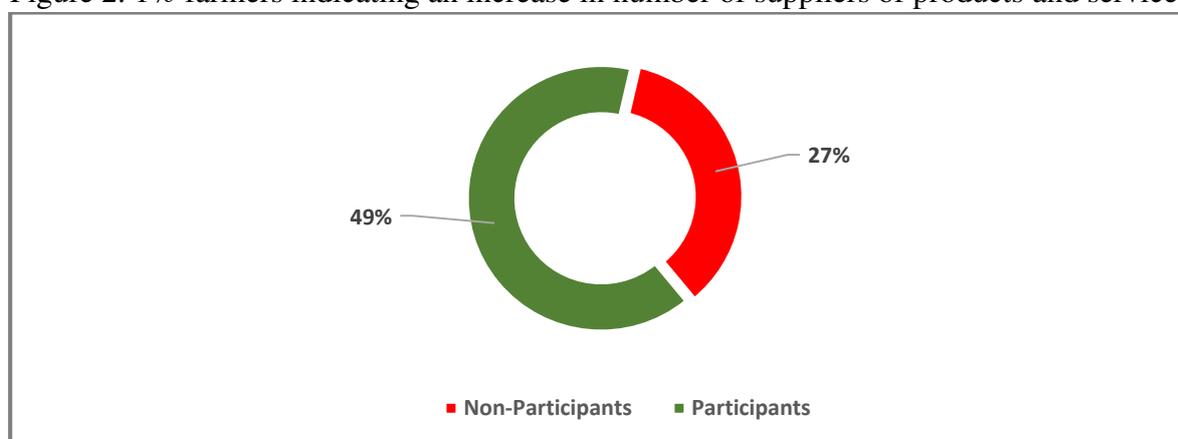
Provinces													
Characteristics		Central		Luapula		Lusaka		Muchinga		Northern		Southern	
	Total/ Average	Participant	Non- participant										
Number of households	911	118	60	76	19	33	26	152	31	120	60	192	24
Household size	7	9	7	6	6	6	6	7	6	7	7	9	8
HH heads' average Age (Years)	45	46	47	42	43	47	52	44	49	42	42	43	44
HH heads' Gender													
Male	86%	84%	82%	78%	74%	82%	92%	91%	84%	98%	83%	96%	88%
Female	14%	16%	18%	22%	26%	18%	8%	9%	16%	2%	17%	4%	13%
Marital status													
Divorced	2%	3%	2%	5%	11%	0%	0%	1%	0%	0%	2%	1%	0%
Monogamously married	80%	71%	78%	79%	68%	76%	81%	88%	90%	94%	87%	71%	75%
Polygamously married	7%	17%	3%	0%	0%	6%	12%	2%	0%	3%	0%	22%	17%
Separated	1%	0%	3%	3%	0%	3%	0%	1%	0%	0%	0%	1%	4%
Single	4%	1%	2%	7%	21%	3%	0%	3%	0%	2%	2%	3%	4%
Widowed	6%	8%	12%	7%	0%	12%	8%	6%	10%	2%	10%	2%	0%
Education level													
No education	6%	3%	15%	5%	5%	6%	0%	5%	16%	2%	8%	2%	4%
Primary	53%	43%	43%	51%	42%	61%	58%	50%	52%	68%	68%	43%	54%
Secondary	39%	47%	37%	41%	53%	30%	38%	43%	32%	30%	22%	52%	42%
Tertiary	2%	8%	5%	3%	0%	3%	4%	2%	0%	0%	2%	3%	0%

Source: AHS 2018

2.2 Access to Improved Markets

Crops: improved products/inputs are key in the enhancement of crop productivity, and high productivity can lead to improved income and food security. Bouchitté & Dardel (2012) connotes that one of the decisive factors in improving the livelihoods of farming communities is very likely the access conditions to agricultural markets. It can therefore be hypothesised that an increase in the number of agricultural product and service providers could lead to farmers being incentivized to produce a marketable surplus. The study found that generally, farmers who were participants (49%) in improved markets observed a higher increase in the number of agricultural product and service providers in their communities than non-participants (27%), see figure 2.1 below. This further suggests crowding in of other private players on the market.

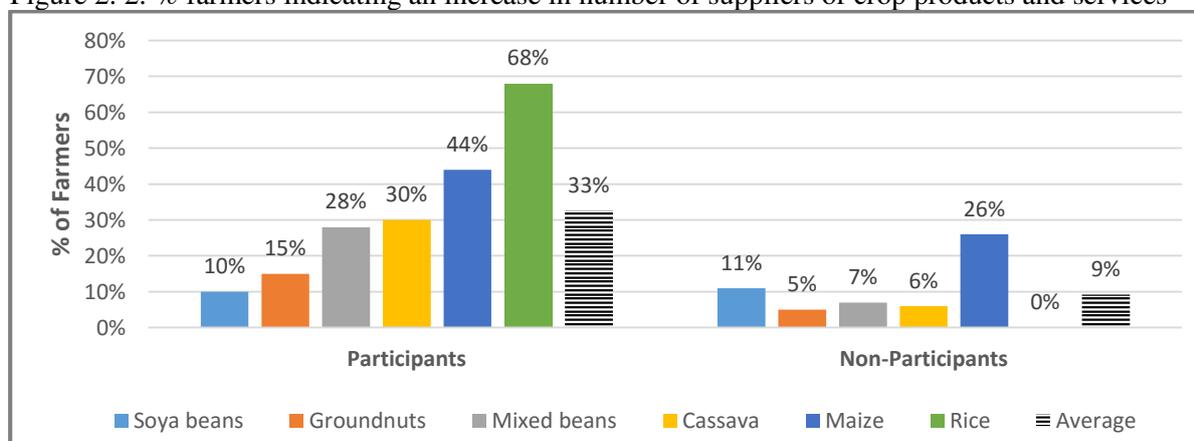
Figure 2. 1% farmers indicating an increase in number of suppliers of products and services



Source: AHS 2018

A further analysis by crop revealed that farmers with access to improved markets had more access to agricultural products/inputs with 68% of the rice farmers in the participants group citing an increase in the number of suppliers of these improved products/inputs, see figure 2.2. It was also established that an average of 33% of the participants indicated an increase in the number of suppliers of these improved products/inputs for the specified crops compared to 9% of the farmers from the non-participant group.

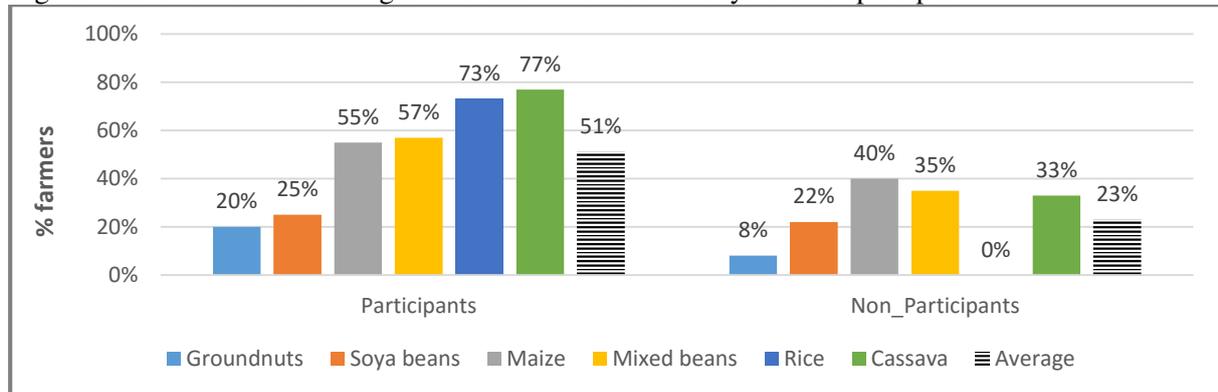
Figure 2. 2: % farmers indicating an increase in number of suppliers of crop products and services



Source: AHS 2018

A higher number of farmers with access to improved markets (participant group) stated to have observed an increase in the number of buyers of products compared to farmers with no such linkages, see figure 2.3. For instance, 77% of the cassava farmers in the participant group compared to 33% of the non-participants noted an increase in the number of commodity buyers. An average of 51% of the farmers in the participant group compared to 23% of the farmers in the non-participant group noted an increase in the number of commodity buyers.

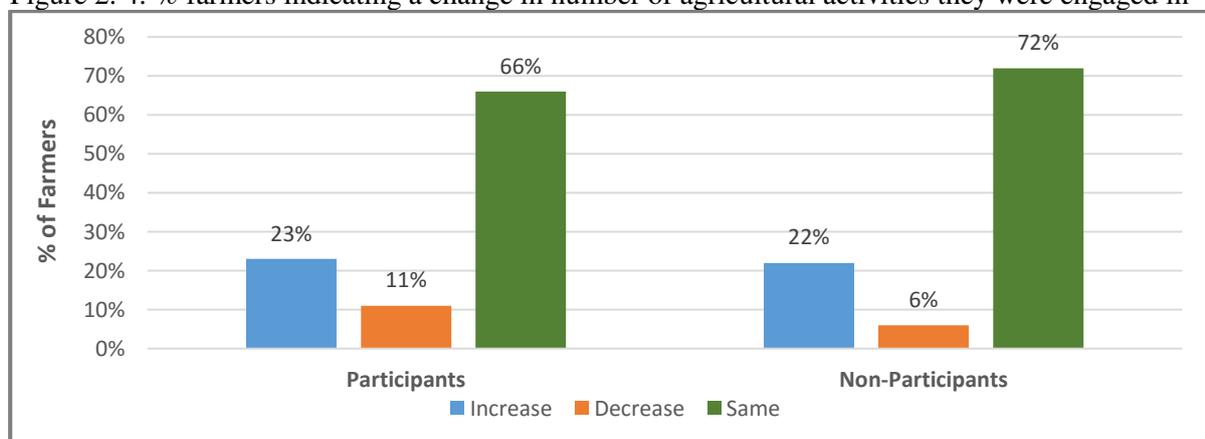
Figure 2. 3: % of farmers stating an increase in number of buyers of crop output



Source: AHS 2018

A change and improvement in the range of activities farmers engage in does not only cushion rural households from food insecurity but can lead to increased income and possibly better nutrition. Thus ensuring agricultural diversification is key. Figure 2.4 below, shows that 23% of the farmers in the improved market participant group indicated an increase in the number of agricultural activities they were engaged in compared to 22% of the farmers who were non-participants in improved markets. Notably, 72% of the farmers in the non-participant group maintained the number of agricultural activities they were engaged in compared to 66% of the farmers in the participant group. What these findings imply is that improved market access does not necessarily lead to crop diversification but it could lead to farmers specialising in a limited number of crops for which there is a market. These findings are corroborated by Sichoongwe et al. (2014) who found that farming households located farther from the nearest market will diversify for food security reasons due to higher transport costs in accessing market, which disincentives them to diversify for commercial purposes.

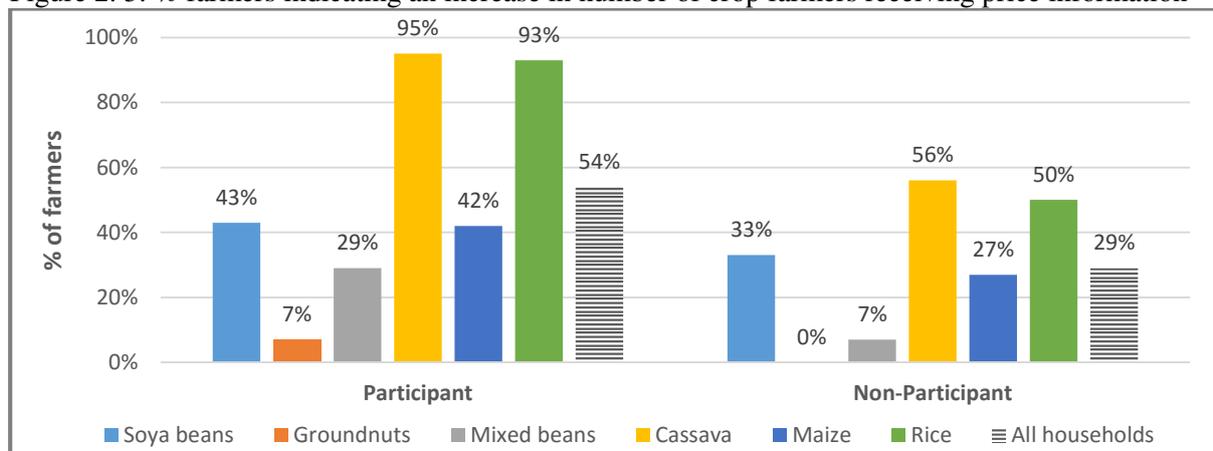
Figure 2. 4: % farmers indicating a change in number of agricultural activities they were engaged in



Source: AHS 2018

Access to technical information is critical in not only aiding decision making by farmers but could be a source of empowerment (Bouchitté and Dardel, 2012). Thus technical information (price) if well understood can also give farmers an added advantage in planning and managing their agricultural production. Generally, more farmers from the participant group received price information in comparison to the farmers in the non-participant group. Price information includes price awareness before taking the commodity to the sales point, grading of the crop and weighing it appropriately for the best possible price. The study found that 95% of the cassava farmers and 93% of the rice farmers in the participant group stated that they received price information from the commodity buyers of their crop output compared to 56% and 50% of cassava and rice farmers in the non-participant group, respectively see figure 2.5.

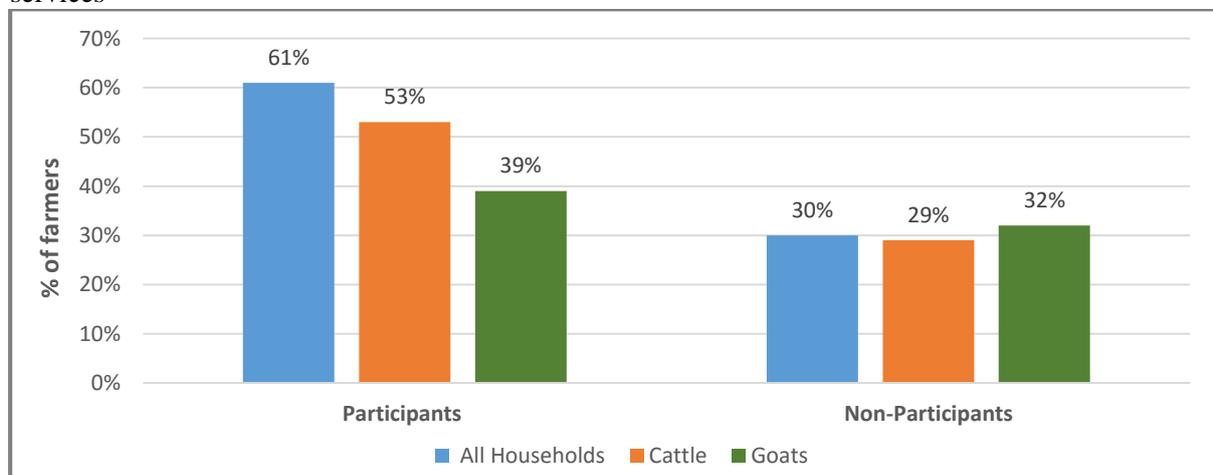
Figure 2. 5: % farmers indicating an increase in number of crop farmers receiving price information



Source: AHS 2018

Livestock: a further look at the farmers involved in livestock production revealed that there was a general increase in the number of suppliers of improved veterinary drugs and services in the participant group (61%) compared to the non-participant group (30%). In terms of farmers involved in cattle production, 53% of the farmers in the participant group stated to have noted an increase in the number of suppliers of veterinary drugs and services compared to 29% of the farmers in the non-participant group, see figure 2.6 below.

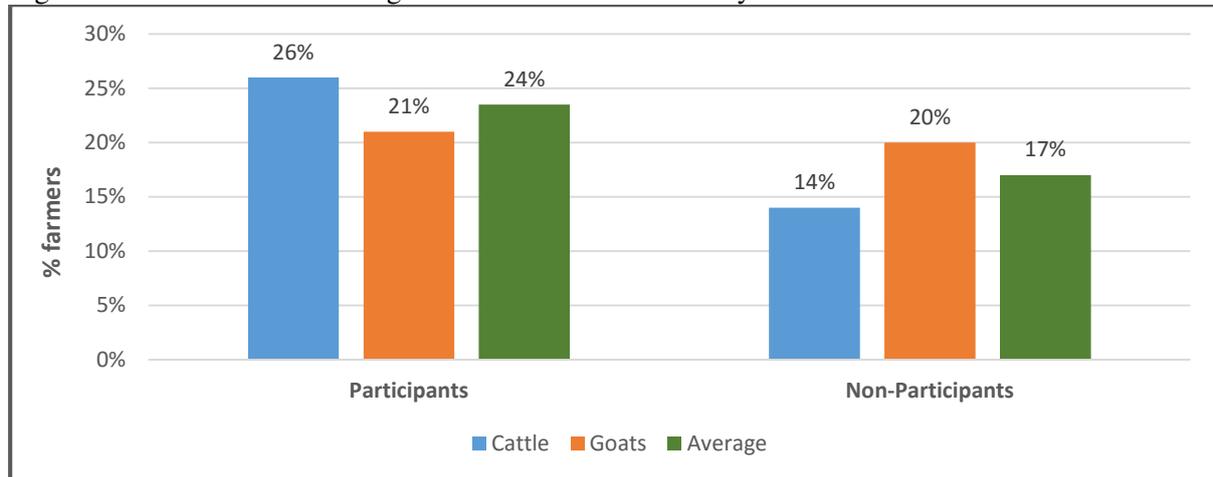
Figure 2. 6: % farmers indicating an increase in number of suppliers of livestock products and services



Source: AHS 2018

A further look at the farmers involved in livestock production showed that there was a general increase in the number of livestock output buyers in the participant group compared to the non-participant group. This research also revealed that 24% of the households in the participant group stated to have observed an increase in the number of livestock output buyers while 17% of the farmers in the non-participant group indicated that they had observed an increase in the number of buyers of livestock, see figure 2.7 below.

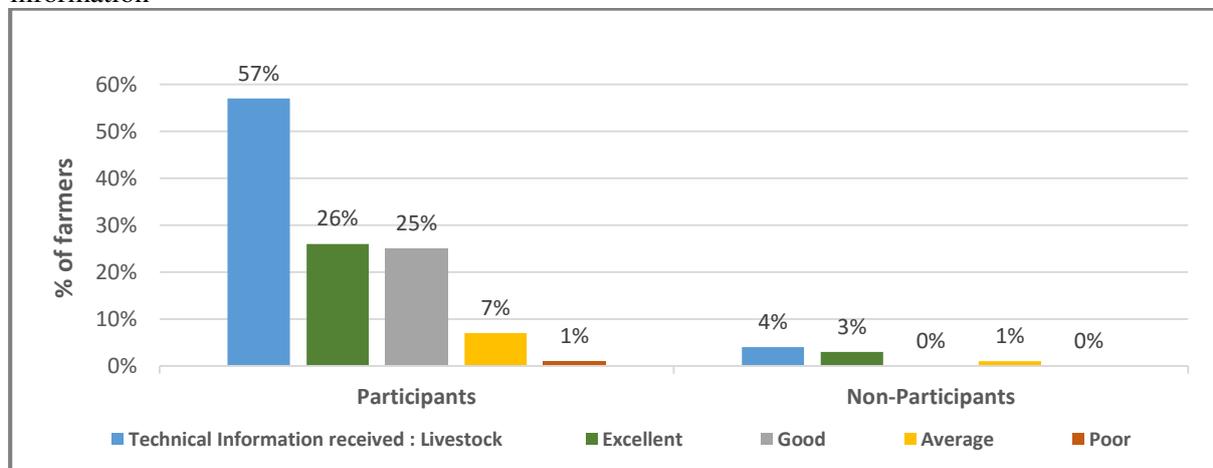
Figure 2. 7: % farmers indicating an increase in number of buyers of livestock



Source: AHS 2018

Technical information is necessary in the delivery of quality inputs and services as it can guarantee increased agricultural production, if farmers understand the information, and eventually can lead to improved income. As can be seen in figure 2.8 below, 57% of the livestock farmers in the participant group accessed technical information compared to 4% in the non-participant group. Furthermore, 26% of the farmers in the participant group stated to have an excellent understanding of the technical information received while 25% stated to have a good understanding of the technical information received. This was in contrast to 3% of the farmers who stated to have excellent understanding, and no farmer from the non-participant group indicated to have a good understanding of the technical information.

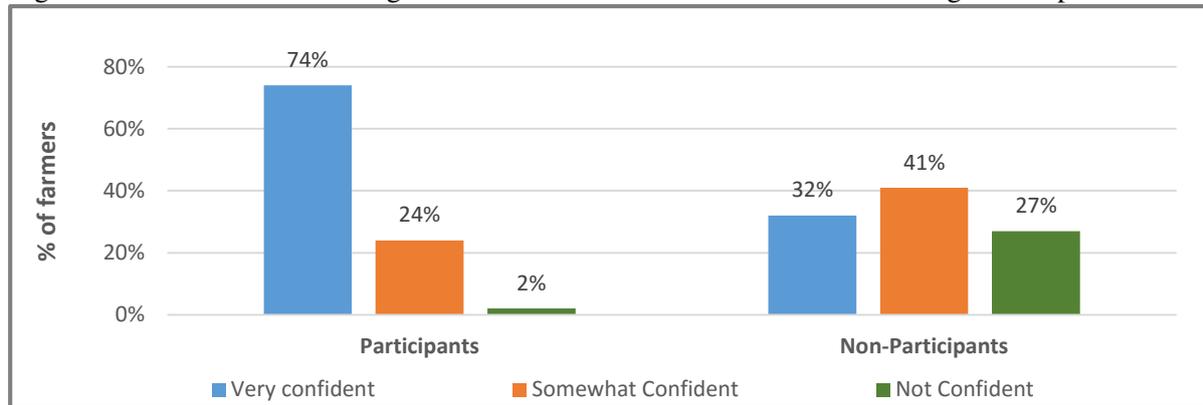
Figure 2. 8: % farmers indicating an increase in number of Livestock farmers receiving technical information



Source: AHS 2018

Confidence in improved markets can ensure long-term participation in improved markets and encourage the enhancement of production of both crop and livestock. Farmers investing in their own production also guarantees sustainability in farmers' production systems, increased income and improved livelihood in general. The study revealed that 74% of the farmers in the participant group stated that they were very confident in investing in their own production compared to 32% in the non-participant group. The study also showed that only 2% of the farmers in the participant group were not confident in investing in their own production compared to 27% of the farmers in the non-participant group, see figure 2.9 below. Evidently, farmers with access to improved markets were generally more confident in investing in their own production than non-participants.

Figure 2. 9: % farmers indicating an increase in levels of confidence in investing in own production

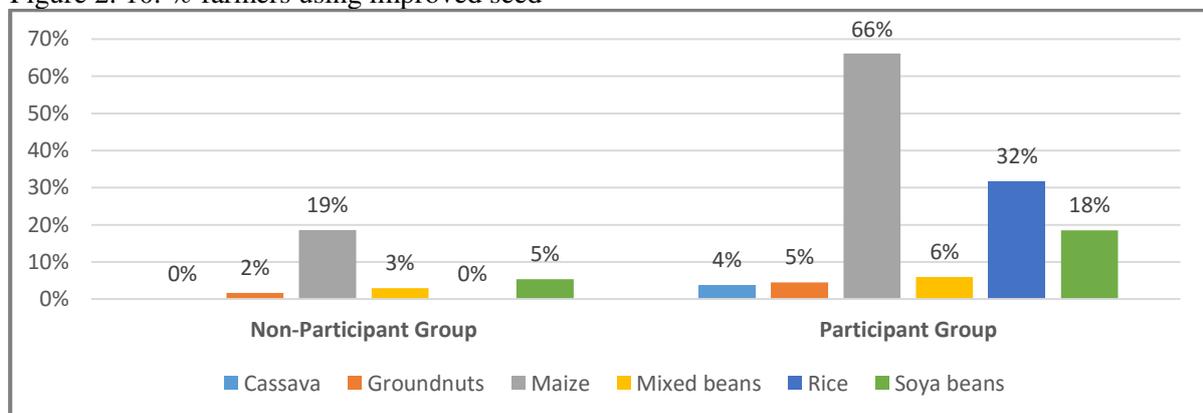


Source: AHS 2018

2.3 Farmers' level of understanding of information and adoption of technologies

Crops: generally, there was a notable difference in the use of improved seed between the non-participant group and the participant group. On average, 22% of the farmers from the participant group used improved seed compared to 5% of the farmers from the non-participant group. Use of improved seed was lower when maize was not included in the calculations as 13% of the farmers used improved seed whilst only 2% used improved seed in the non-participant group. Use of improved seed was prevalent amongst farmers who grew maize for both the non-participant (19%) and participant group (66%), see figure 2.10 below.

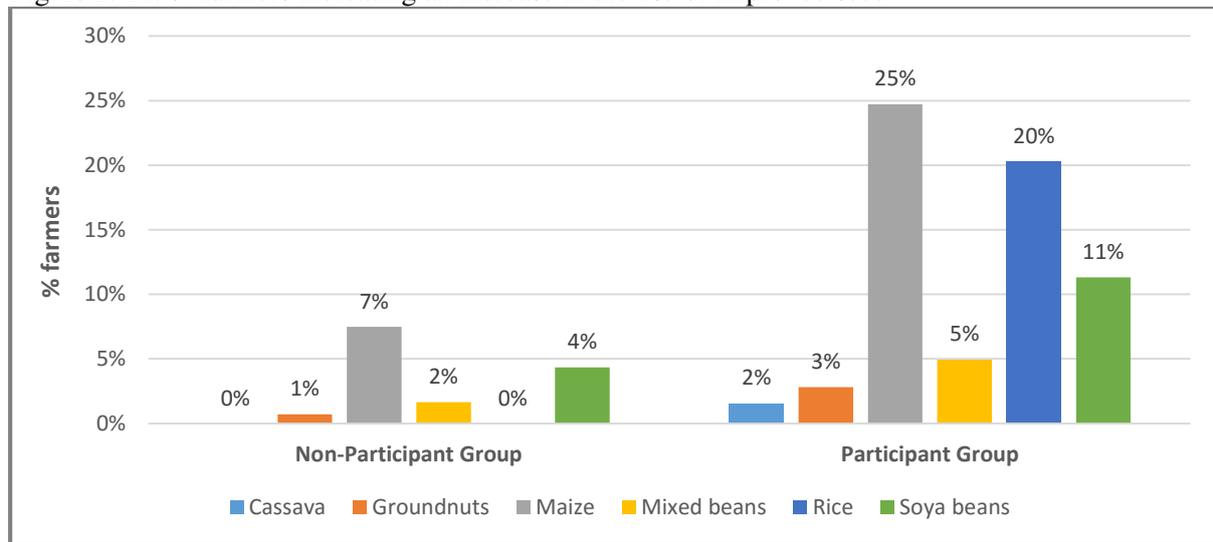
Figure 2. 10: % farmers using improved seed



Source: AHS 2018

The study further revealed that between the participant and non-participant group, more farmers from the participant group indicated an increased use of improved seed than farmers from the non-participants group, see figure 2.11 below. A similar pattern was observed between farmers indicating use of improved seed, and farmers indicating an increase in the use of seed the last farming season (2017/2018 agricultural season). This then suggests that improved markets have a key role to play in enhancing the uptake of improved technologies such as improved seed.

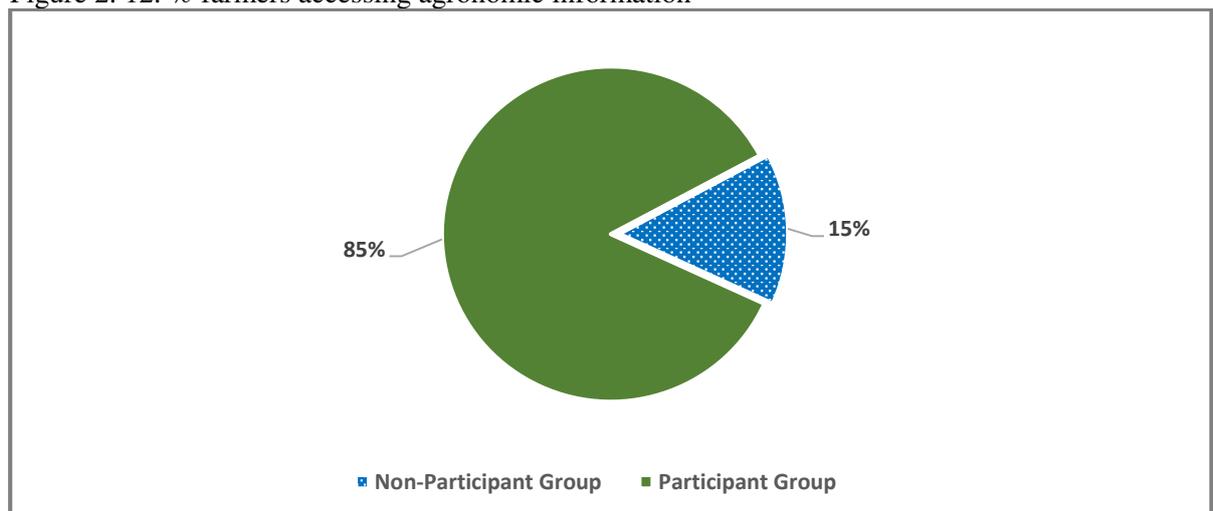
Figure 2. 11: % farmers indicating an increase in the use of improved seed



Source: AHS 2018

In terms of access to agronomic information, it was found that more farmers participating in improved markets received extension information (85%) than farmers from the non-participant group (15%), see figure 2.12. Information dissemination, with an assumption that it is well understood, has the potential of influencing farmers to take up improved farming methods.

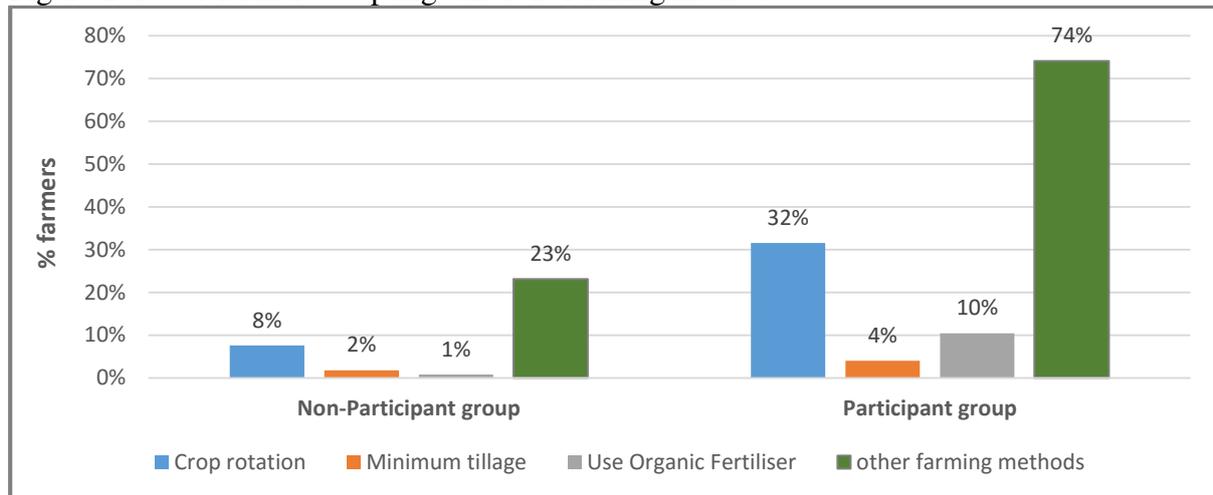
Figure 2. 12: % farmers accessing agronomic information



Source: AHS 2018

Overall, there were notable differences between farmers in the participant group and those in the non-participant group with regards to the adoption of climate smart agricultural techniques², despite the overall usage of these methods being low, see figure 2.13 below. The difference was pronounced in the uptake of crop rotation and use of organic fertiliser as more farmers from the participant group were observed to have taken up such practices compared to farmers from the non-participant group. The “other farming methods” were dominant in both the participant and non-participant group, and these methods were largely conventional farming methods with or without application of fertiliser.

Figure 2. 13: % farmers adopting different farming methods



Source: AHS 2018

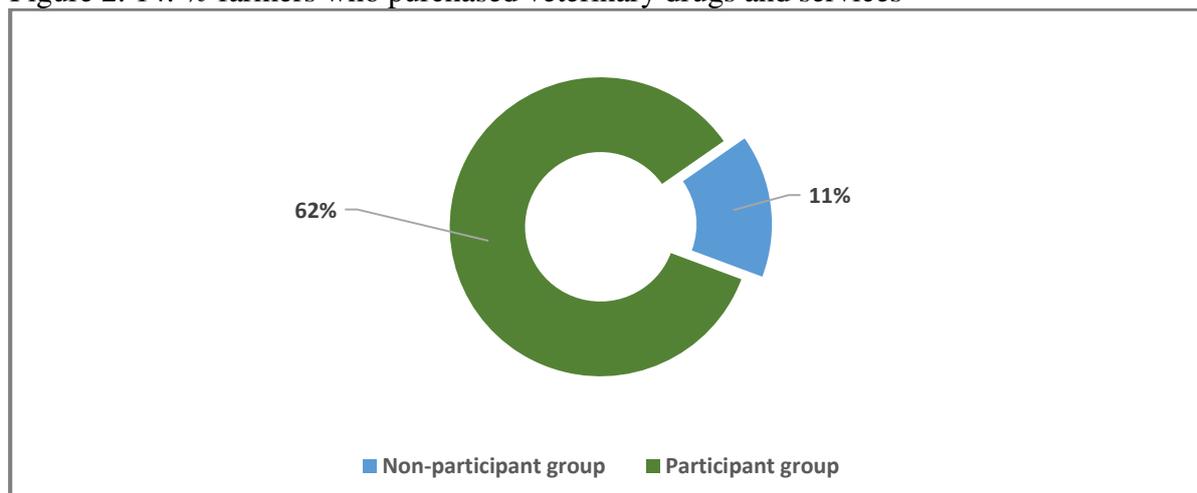
Increased productivity requires modernisation of agriculture, which is key to increasing crop productivity and food production. However, access to machinery remains low, only 2% of the farmers from the participant group accessed mechanisation services. No farmer from the non-participant group accessed mechanisation services. The low accessibility of mechanisation services could be attributed to fewer Mechanisation Service Providers (MSPs) on the ground.

Furthermore, only 0.1% of the farmers in the participant group used irrigation in their agricultural production in the 2017/18 agricultural season, and no farmer from the non-participant group used irrigation in the same period. Thus farmers hardly used irrigation in their agricultural production.

Livestock: Apart from the fact that 57% of the livestock farmers from the participant group stated to have received information compared to 4% of the farmers from the non-participant group, the study further revealed that 62% of the farmers from the participant group purchased veterinary drugs and services compared to 11% from the non-participant group, see figure 2.14 below. The implication of this is that information dissemination by Musika linked firms can lead to farmers investing in their livestock enterprises. This has the potential of positively influencing livestock productivity (Sichilima, 2017).

² Climate Smart Agriculture in this context is being defined as farming practices which include: minimal mechanical soil disturbance, maintenance of a mulch of carbon- rich organic matter covering and feeding the soil, and rotations or sequencing of crops including nitrogen fixing trees/legumes.

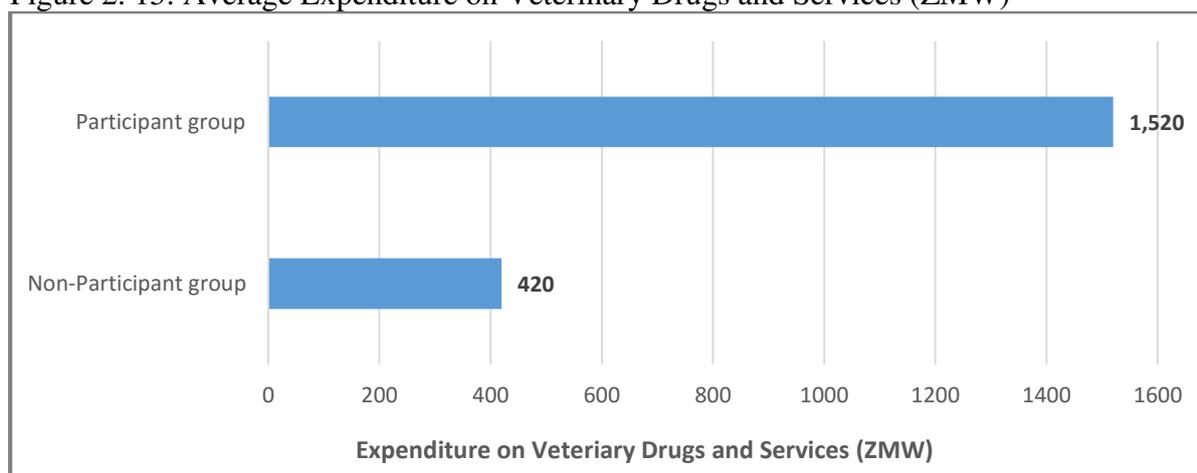
Figure 2. 14: % farmers who purchased veterinary drugs and services



Source: AHS 2018

On average, farmers from the participant group spent ZMW1,520 on veterinary drugs and services whilst farmers from the non-participant group spent ZMW420. Thus not only did more farmers from the participant group spend on veterinary drugs and services, they also spent more than thrice the amount spent by farmers in the non-participant group, see figure 2.15 below.

Figure 2. 15: Average Expenditure on Veterinary Drugs and Services (ZMW)

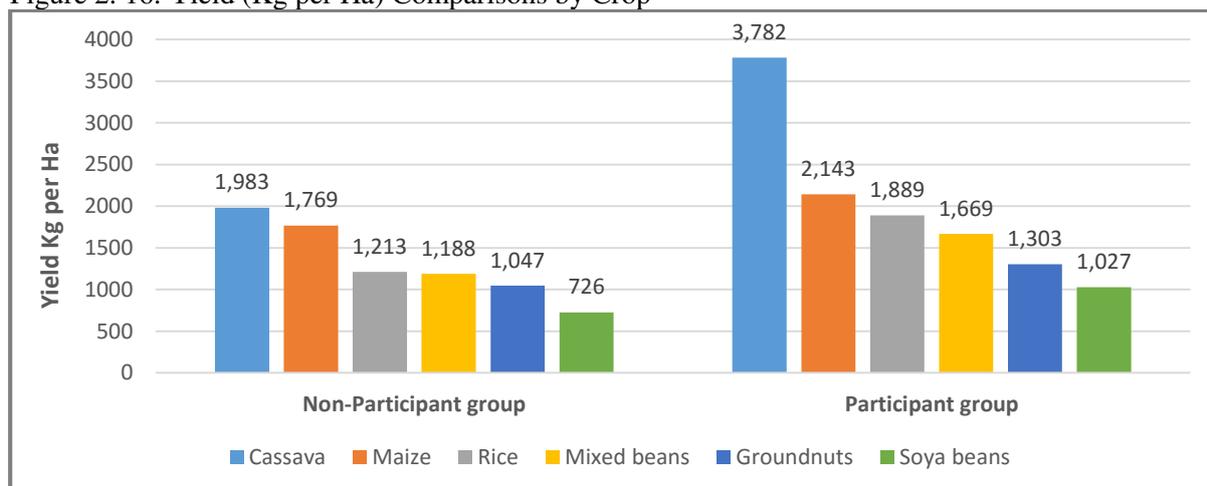


Source: AHS 2018

2.4 Farmers' level of production and productivity

Crops: farmers with linkages to improved markets were found to have higher yields than farmers from the comparison group. For instance, farmers in the participant group generated better yields by 46% compared to the non-participant group. The largest difference in yield was observed for cassava as the participant group recorded almost twice the yield for the non-participant group, see figure 2.16 below.

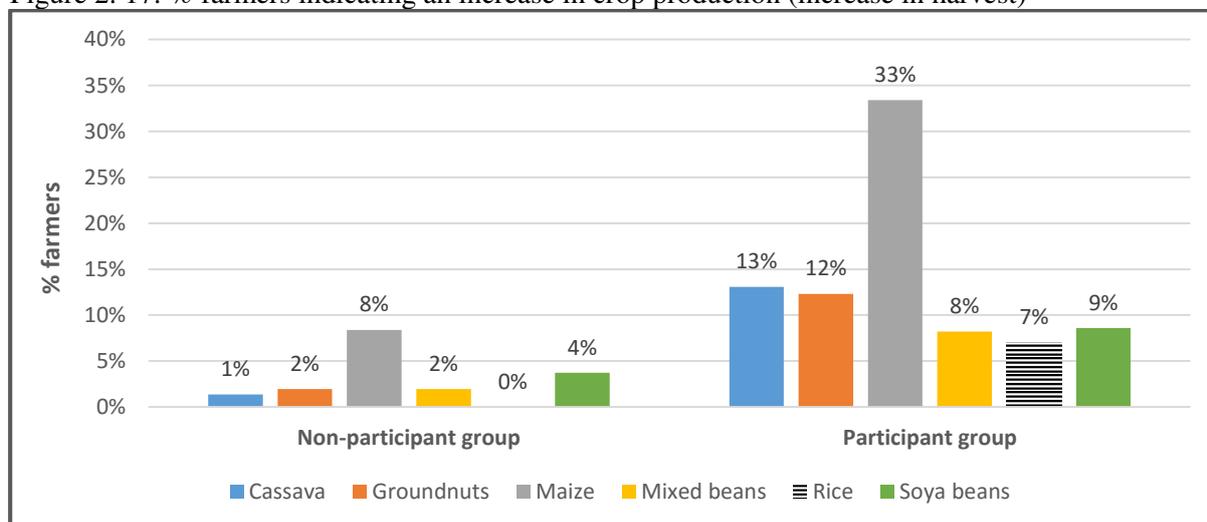
Figure 2. 16: Yield (Kg per Ha) Comparisons by Crop



Source: AHS 2018

Moreover, 39% of the households from the participant group stated that their crop production increased the past agricultural season (2017/18) compared to 7% of the farmers from the non-participant group. At crop level, 13% of the cassava farmers from the participant group stated an increase in their production compared to 1% from the non-participant group, see figure 2.17 below. The reason given for this increase was good management, 84% of the farmers who stated an increase in cassava production indicated good management as the main reason for improved cassava harvest. A similar response was noted for the other crops, especially for the participant group.

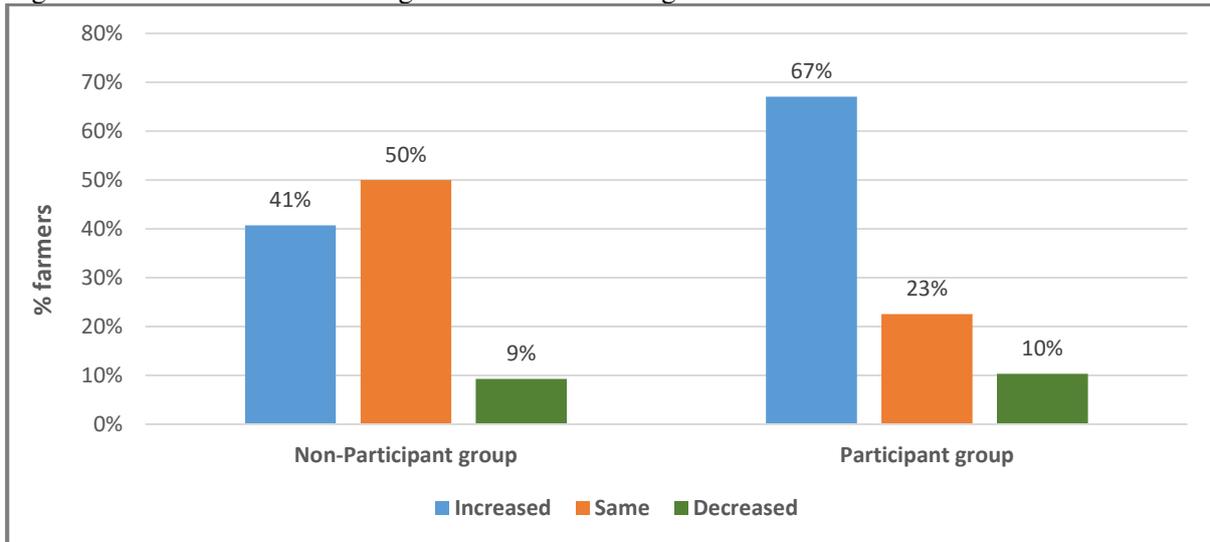
Figure 2. 17: % farmers indicating an increase in crop production (increase in harvest)



Source: AHS 2018

Livestock: on average, each farmer owned 20 cattle. Farmers in the participant group owned 22 cattle in comparison to an average of 10 cattle owned by farmers in the non-participant group. The research also found that 67% of the farmers linked to improved markets indicated that their herd size increased over the past year in comparison to 41% of the farmers in the non-participant group, see figure 2.18.

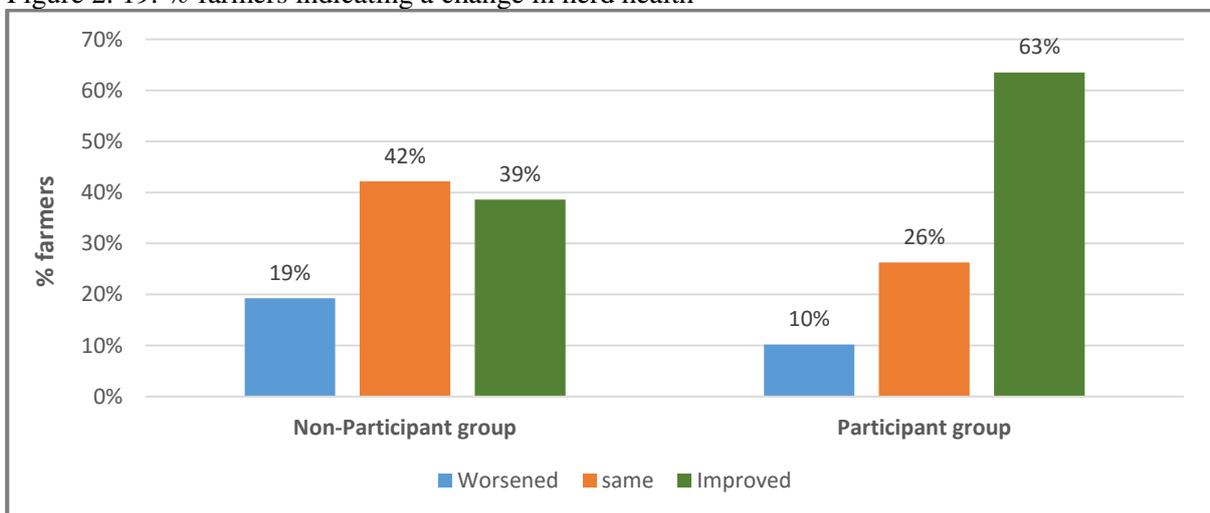
Figure 2. 18: % farmers indicating an increase in calving rate



Source: AHS 2018

The better calving rates observed by the farmers linked to improved markets could be attributed to services accessed such as drugs and veterinary services as 62% of the farmers in the participant group accessed veterinary drugs and services compared to 11% in the comparison group. This could further be explained by the difference in the number of farmers indicating improvements in herd health, it was found that 63% of the farmers who accessed improved markets observed improved health for their herd compared to 39% in the comparison group, see figure 2.19. This suggests that improved markets for livestock have significant potential of affecting the productivity of livestock.

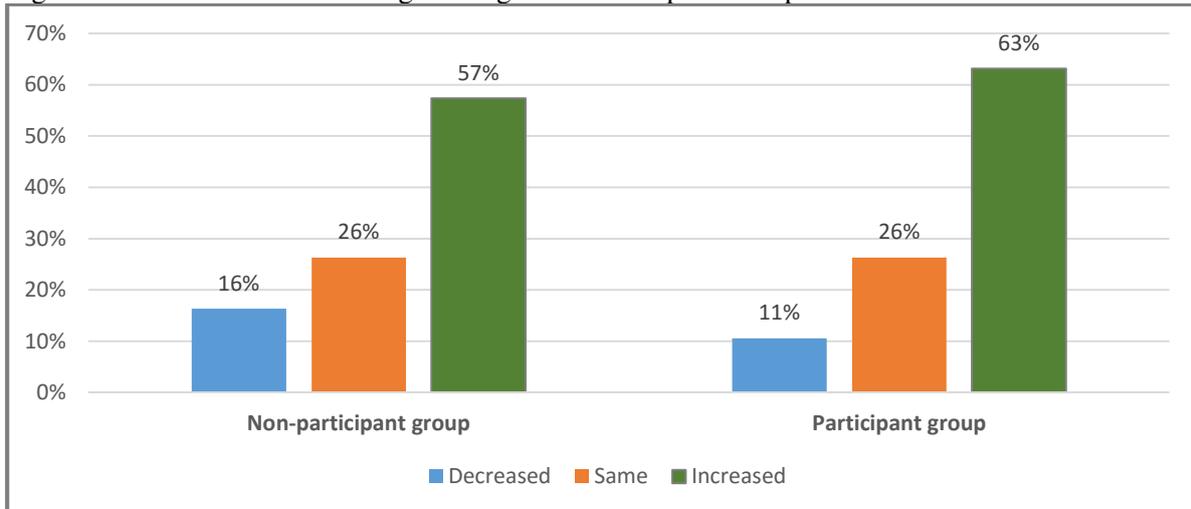
Figure 2. 19: % farmers indicating a change in herd health



Source: AHS 2018

In terms of dairy production, it was found that farmers who were linked to improved markets obtained 538 litres of milk per month compared to 266 litres per month by farmers from the non-participant group. It was also noted that 63% of the farmers in the participant group indicated an increase in the amount of milk produced per month compared to 57% of farmers in the non-participant group, see figure 2.20 below.

Figure 2. 20: % farmers indicating a change in the milk produced per month

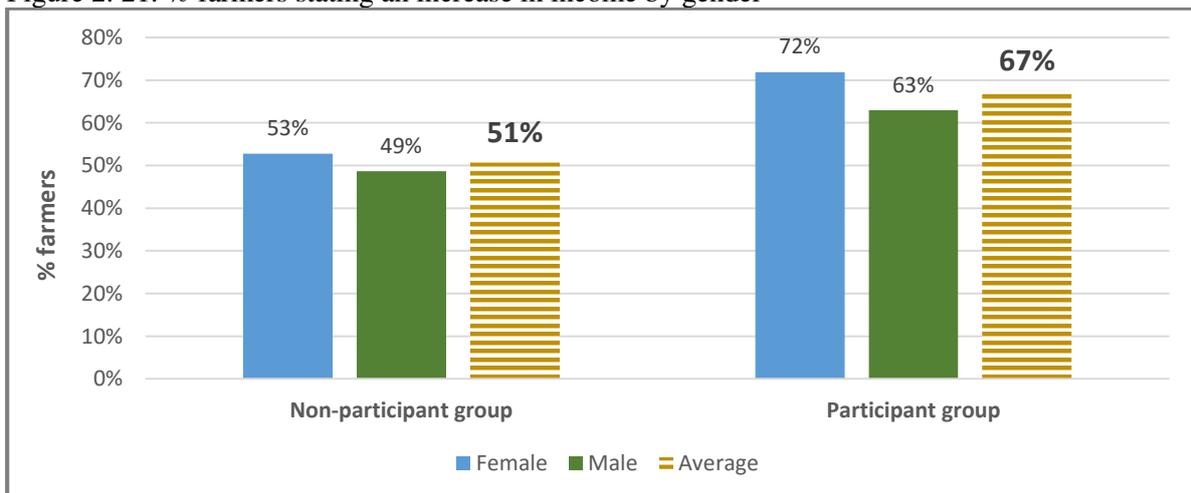


Source: AHS 2018

2.5 Changes in income levels

While farmers in both the participant and non-participant group stated that their income increased due to their engagements in various agricultural markets, generally more farmers from the participant group noted an increase in their annual incomes, and this could be attributed to access to improved agricultural markets under Musika interventions. As can be seen in the figure 2.21 below, 67% of the farmers in the participant group perceived to have increased income due to their access to improved markets compared to 51% of the farmers from the non-participant group. Thus access to improved market correlates with improved income. This suggests that access to improved market leads to farmers realising a financial benefit.

Figure 2. 21: % farmers stating an increase in income by gender

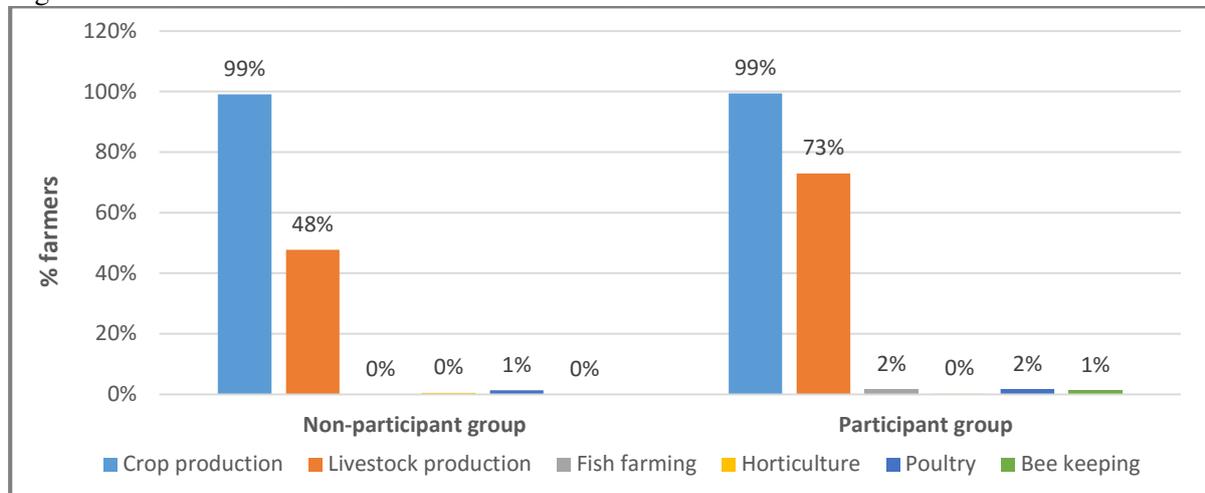


Source: AHS 2018

It was further garnered from the study that whilst there was variation in households' involvement in different agricultural activities, on average, households were engaged in at least two different agricultural livelihood activities. The households from the participant group were engaged in more livelihood activities than households from the non-participant group, on

average, there was one more livelihood activity in the participant group than in the non-participant group. The study found that 99% of farmers from both the participant and non-participant group were engaged in crop production, see figure 2.22 below.

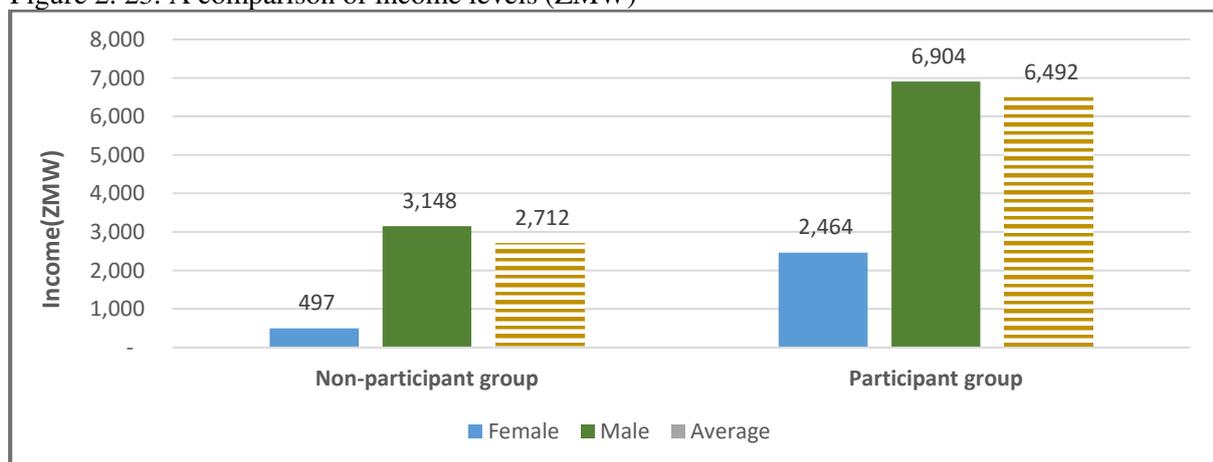
Figure 2. 22: % farmers involved in different livelihood activities



Source: AHS 2018

Furthermore, the participant group generated twice the amount of money made by the non-participant group. On average, ZMW2,712 was generated by farmers in the non-participant group whilst the participant group obtained ZMW6,492 from selling of agricultural produce, see figure 2.23. A striking distinction was also noted, whilst females (figure 2.21) had generally perceived higher increases in income than males, absolute values showed otherwise. This could imply that women felt that they were generating higher revenue by participating more in the agricultural markets than before despite men still dominating in terms of the actual shares of household revenue.

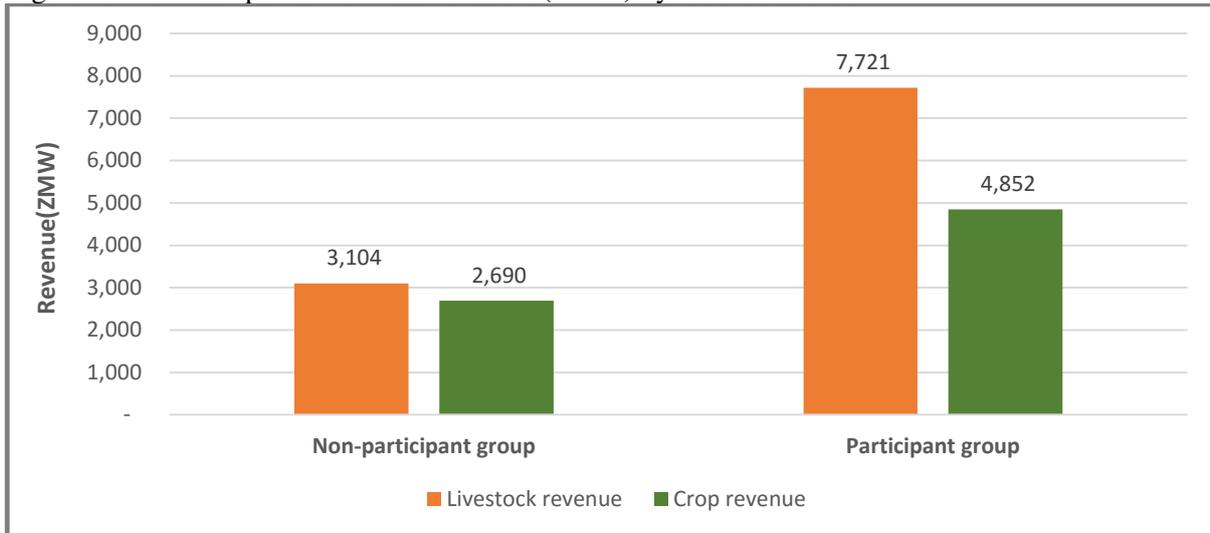
Figure 2. 23: A comparison of income levels (ZMW)



Source: AHS 2018

It was further noted that much of the revenue was obtained from livestock sales as opposed to crop sales, this was observed from both groups, see figure 2.24 below. Thus livestock is critical in enhancing farmer income levels.

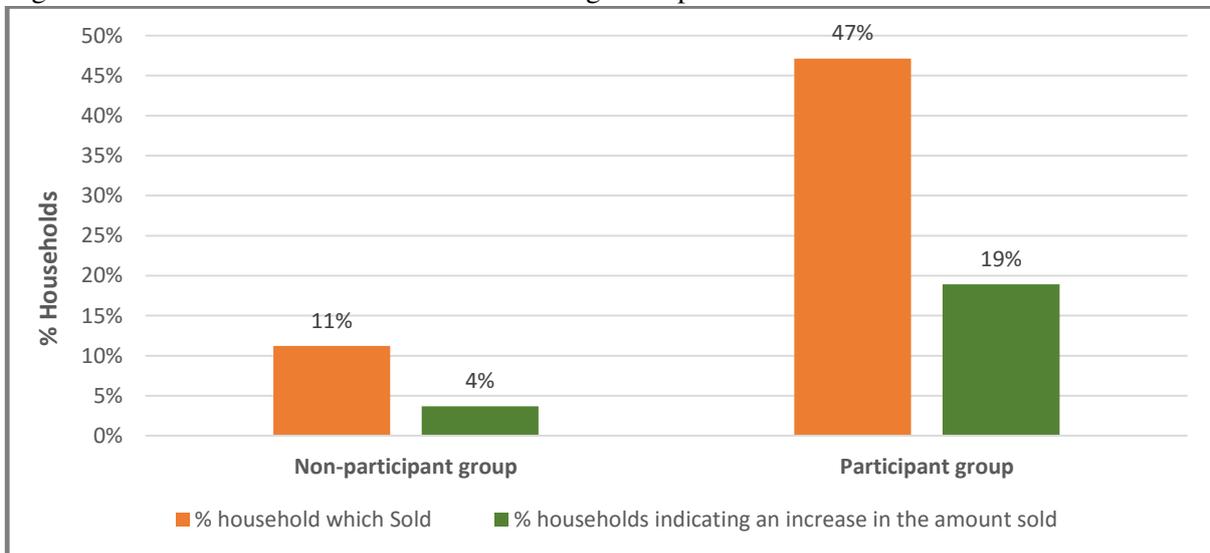
Figure 2. 24: A comparison of income levels (ZMW) by revenue source



Source: AHS 2018

Crops: the study found that 47% of the households in the participant group sold crops compared to 11% of the households from the non-participant group, representing a 36% difference in favour of improved market linked farmers, see figure 2.25 below. A similar pattern was also noted regarding the number of households who indicated an increase in the amount of crop sold, 15% more households from the participant group indicated to have observed an increase in the amount of crop sold over the past 2017/18 agricultural season.

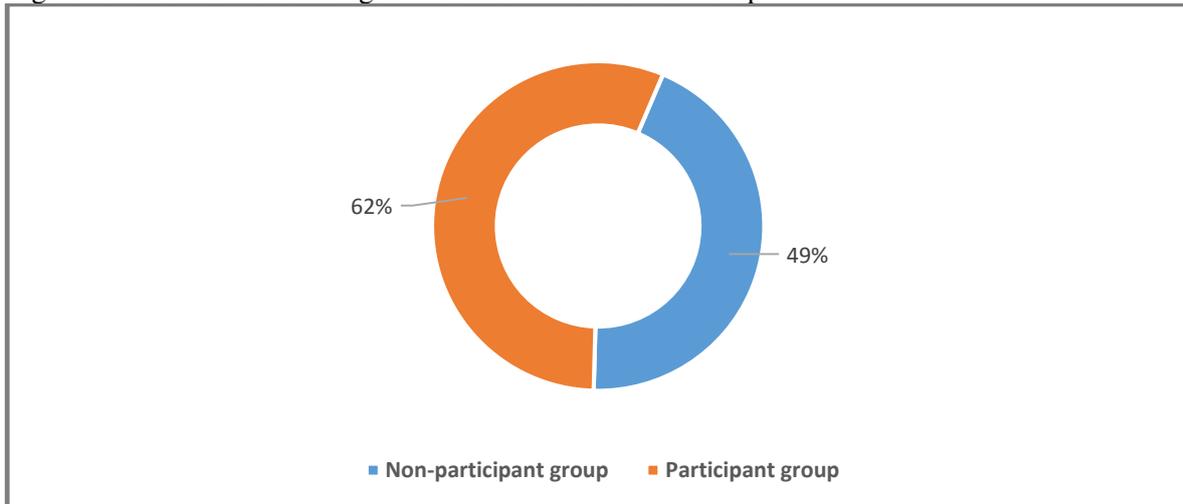
Figure 2. 25: % households involved in the selling of crops



Source: AHS 2018

The majority of households noted increases in income from crop sales, 13% more households from the participant group indicated an improvement in income than farmers from the non-participant households, see figure 2.26 below.

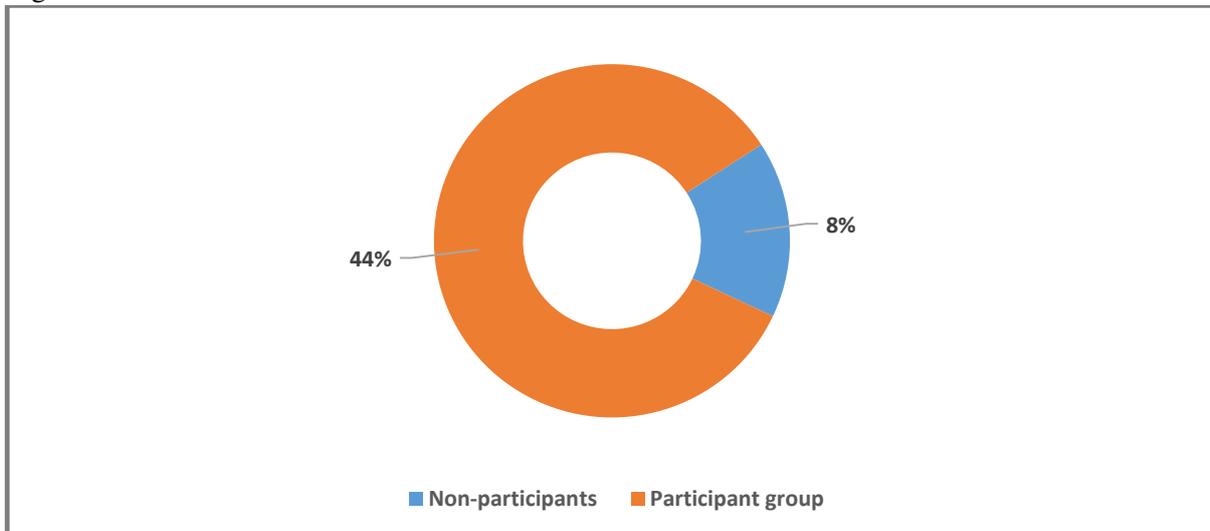
Figure 2. 26: % farmers stating an increase in income from crop



Source: AHS 2018

Livestock: it was observed from the study that 51% of the households captured kept livestock i.e. cattle and goats. And of the total number of households that kept livestock, 44% of the farmers sold livestock in the participant group compared to only 8% from the non-participant group over the past agricultural season, see figure 2.27.

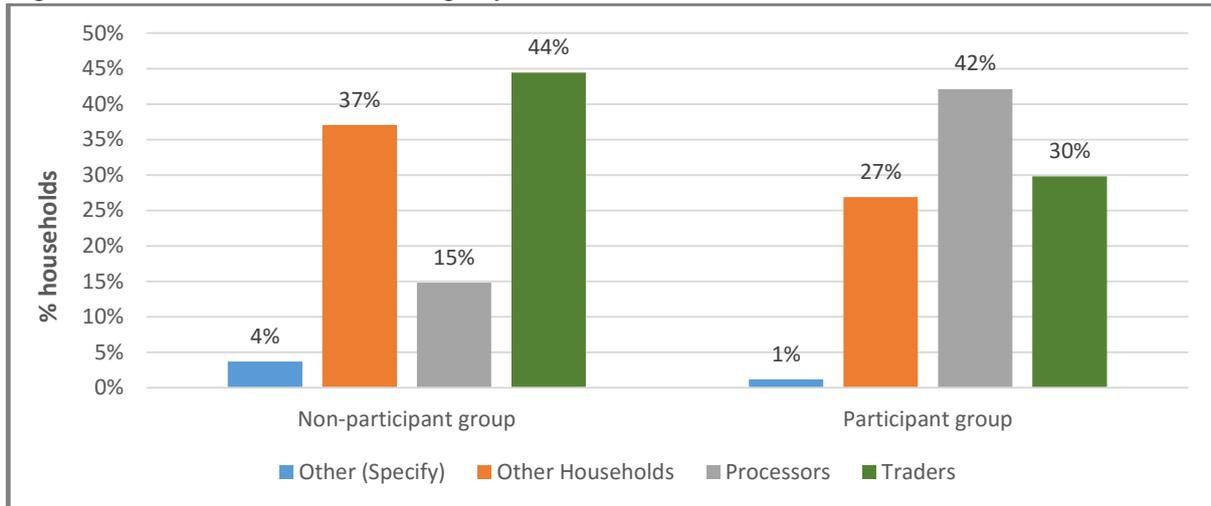
Figure 2. 27: % households who sold livestock



Source: AHS 2018

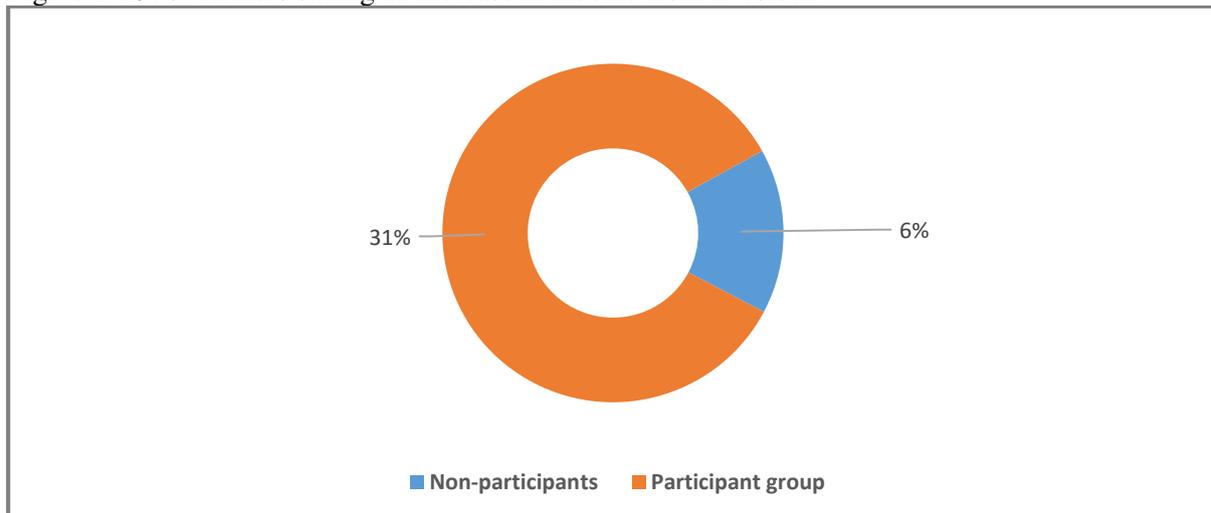
For households which sold livestock, the dominate buyers for the participant group were the processors (42%) compared to traders in the non-participant group, see figure 2.28 below. Furthermore, more households in the non-participant group sold to other households (37%) compared to households in the participant group (27%). These findings suggest that households in the participant group had more formal market linkages than households in the non-participant group especially through the processor channel.

Figure 2. 28: % households indicating buyer of livestock



In terms of revenue generation from livestock, a higher number of households (31%) in the participant group indicated an increase in revenue (income) from livestock than households in the non-participant group (6%) over the past 2017/18 agricultural season, see figure 2.29.

Figure 2. 29: % farmers stating an increase in income from livestock



Source: AHS 2018

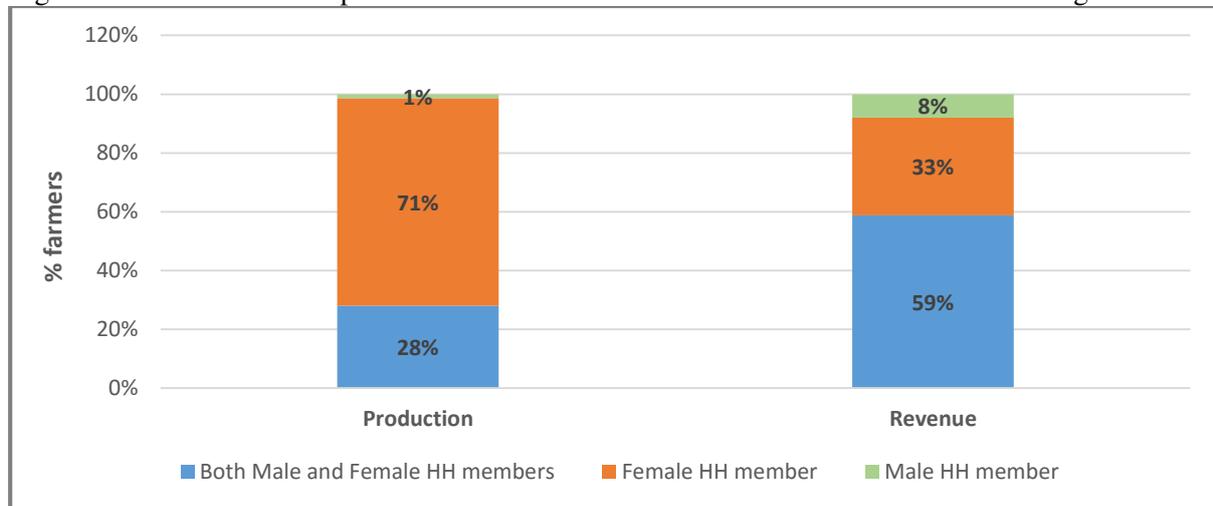
2.6 Cross Cutting Themes

2.6.1 Gender

Female participation in the agricultural sector is very vital at every node of the agricultural value chain especially that women provide the majority of the labour in agriculture (Curtis, et al., 2015). This study found that the majority of groundnut producers were women. There was a 38% decrease of women in decision making from production to revenue use, and a small increase (7%) in the number of men making decisions from production to revenue use. There was a notable improvement (31%) of joint decision making from production to revenue use by both gender, see figure 2.30. The implication of this finding is that despite the sole decision making by women reducing from production to revenue use, there was an improvement in their

participation in joint decision making. Other studies have shown that women were more likely to spend the income obtained from agricultural production on their households' wellbeing and this contributes to food security (Mehra & Rojas, 2008).

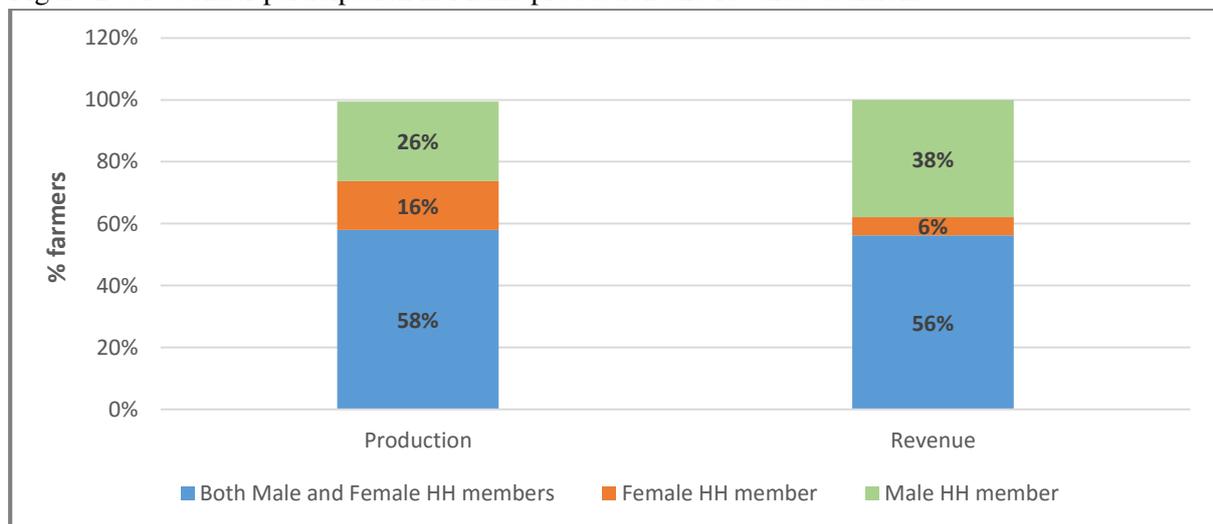
Figure 2. 30: Gender Participation in Groundnut Production and Revenue Decision Making



Source: AHS 2018

Maize production was found to be dominated by men at both nodes, and this could be because traditional norms consign women's decision making authority to men when they are married (Sichilima, Ngoma-Kasanda, & Ikabongo, 2016). This is consistent with the findings of this study as shown in figure 2.31 below. Decisions on maize production and revenue were mainly made by males. Sole decision making by females as well as joint decision making declined from production to revenue use.

Figure 2. 31: Gender participation in Maize production and revenue decisions

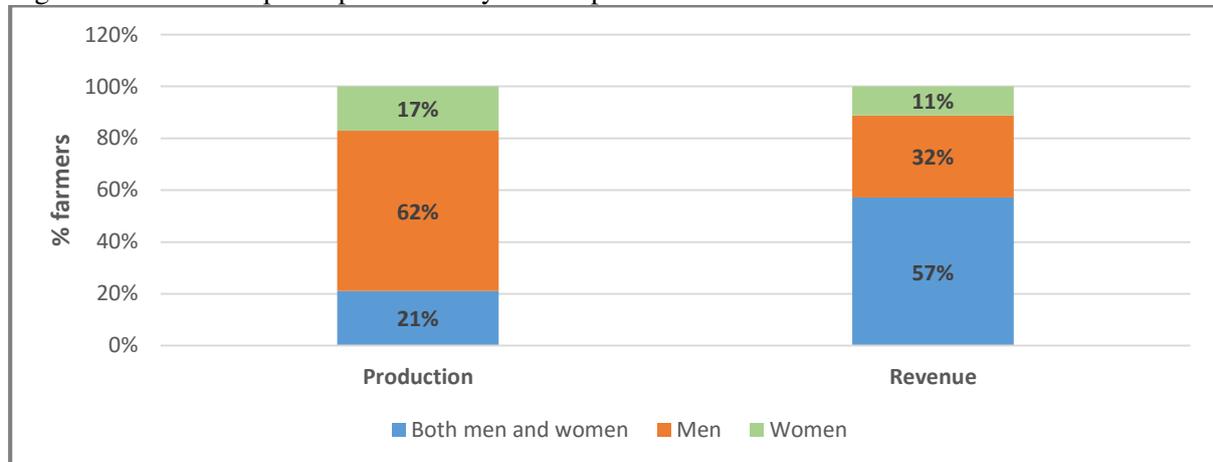


Source: AHS 2018

The study further revealed that soya beans production, like in the case of maize, was dominated by men probably because of the labour requirements of the crop. Figure 2.32, highlights that there were more male producers of soya beans than females. Even though decision making by females deteriorated from production to revenue use, the same pattern was also observed for male farmers. In fact, the number of females involved in decision making decreased by 6%

compared to a decrease of 30% by males. The implication of this is that joint decision making by both male and female improves, and it could be stated that women benefit the most as they become part of decision making over revenue.

Figure 2. 32: Gender participation in Soya beans production and revenue decisions

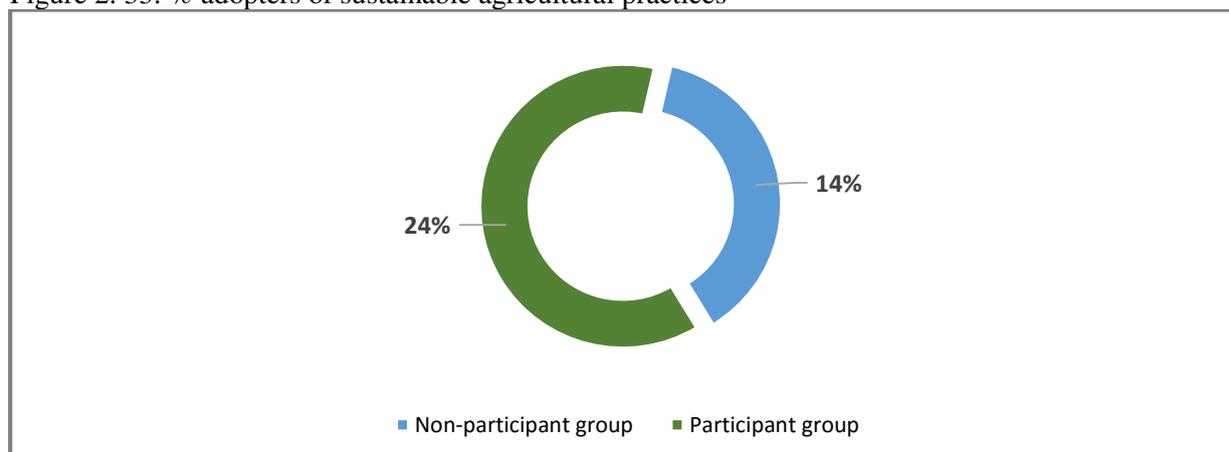


Source: AHS 2018

2.6.2 Environment

In order to ensure continuity and consistency of food production and supply every year, farmers need to adopt sustainable agricultural practices. However, adoption of sustainable agricultural practices has over the years been quite low. By 2015, full adoption of conservation agriculture (CA) practices for instance was 4.8% (Zulu-Mbata & Chapoto, 2018). However, the findings of this study showed that 24% of the households under the environment from the participant group adopted some form of sustainable agricultural practice compared to 14% of households from the non-participant group, see figure 2.33. Given the changes in climate and its effect on agriculture, it is vital that farmers adopt Climate Smart Agricultural (CSA) practices such as crop rotation, use of organic fertilizer and minimum/zero tillage.

Figure 2. 33: % adopters of sustainable agricultural practices

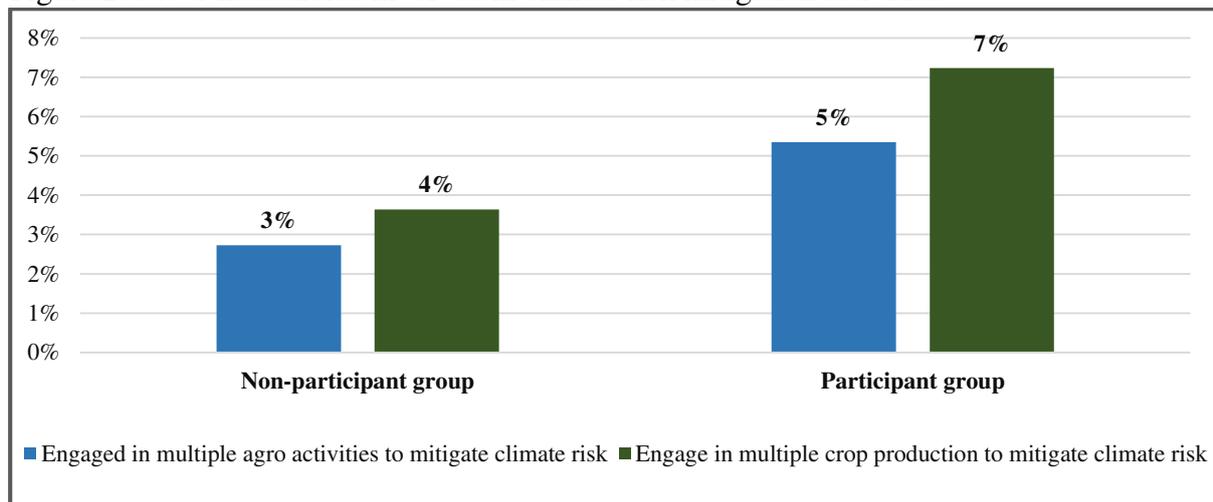


Source: AHS 2018

Climate change keeps threatening world's food security and Zambia is not exempted from the effects of climate change. It is for this reason that farming households devised ways of mitigating against climate change. The study showed that 5% of the households from the

participant group cited climate risk mitigation as their major reason for engaging in multiple agricultural activities such as crop and livestock production compared to the 3% from the non-participant group, see figure 2.34. For those that engaged in multiple crop production, 7% from the participant group cited mitigation to climate risk as their main reason for such engagements whereas 4% of the households who cited the same reason came from the non-participant group. Most households were motivated to engage in multiple agricultural activities mainly for income purposes.

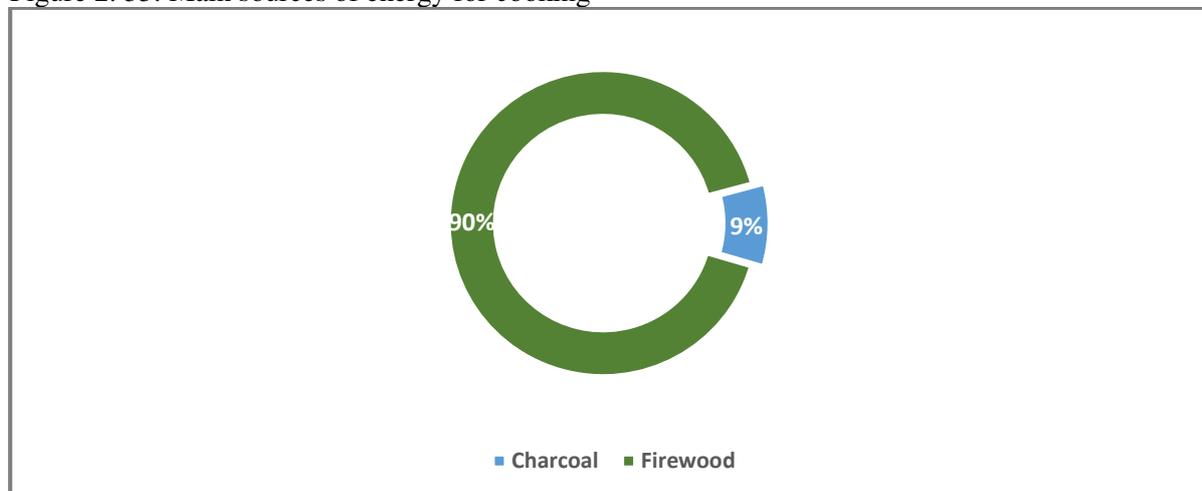
Figure 2. 34: % households involved in climate risk mitigation activities



Source: AHS 2018

Research further revealed that the majority of households used firewood as their main source of energy for cooking, charcoal use was lower than firewood, see figure 2.35. These statistics are consistent with the findings from the compendium of environmental statistics, which highlighted that 84.5% of rural households in Zambia use firewood for cooking and 13.2% use charcoal (CSO, 2015). These findings highlight the need for Research and Development (R & D) in cheaper sources of energy for cooking and the need to sensitise rural households on smart and sustainable ways of using the natural resources that the forests provide. This further calls for more promotion of environmentally friendly energy sources such as cook stoves, biogas, etc.

Figure 2. 35: Main sources of energy for cooking

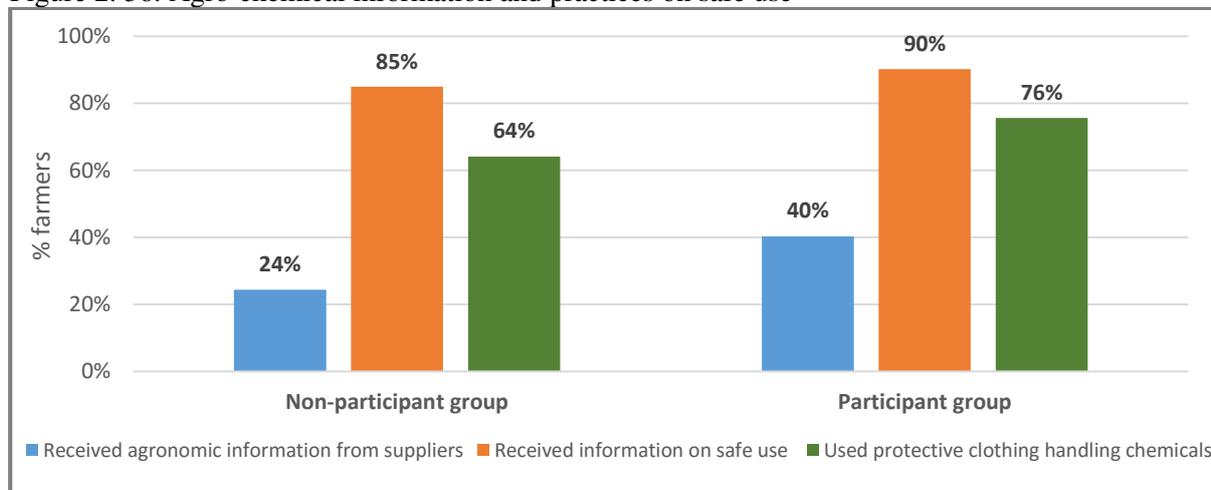


Source: AHS 2018

2.6.3 Use of Agro chemicals

Agro-chemicals are important in the agricultural production process as they help to prevent and cure various pests and diseases and preserve food for future consumption and/or sale. Nevertheless, agro-chemicals do also pose a threat not only to humans but to the environment as well. It is for this reason that the study sought to find out the level of use of agrochemicals as well as assess the level of safe use. The study found that use of agrochemicals was higher in the participant group (25%) than in the non-participant group (17%). Furthermore, 40% of the households from the participant group indicated that they had received agronomic information from agro-chemical suppliers regarding usage of the chemicals compared to 24% farmers from the non-participant group, see figure 2.36 below. Interestingly, a lot of households from both the participant group (90%) and non-participant group (85%) received information on safe use of agro-chemicals. Receiving information on safe use is one thing and putting such information to practice during handling/use of agro-chemicals is another. It is for this reason that this study endeavoured to find out if farmers had at the very least used some form of protective clothing whilst handling agro-chemicals. About 76% of the households from the participant group wore some form of protective clothing whereas 64% from the non-participant group did. Many farmers wore incomplete sets of protective clothing, others even used improper materials such as plastics to protect themselves. Because the willingness to practise safe use is there, there is need to increase the sensitisation of farmers on the health implications of these agro-chemicals in order for them see that investing in proper protective clothing is actually investing in their own lives.

Figure 2. 36: Agro-chemical information and practices on safe use



Source: AHS 2018

2.6.3 Nutrition

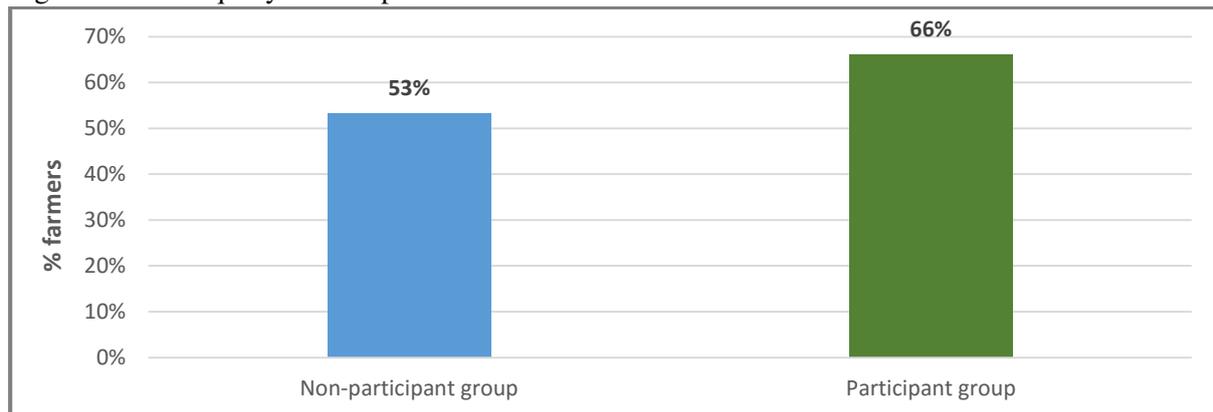
Adequacy of food provision

Although nutrition may seem like an obvious outcome from agricultural programming, in the past many interventions have focused on productivity and marketing. This could have contributed to the high levels of malnutrition, especially in the case of Zambia. Thus the importance of nutrition in promoting health and productivity cannot be overemphasized. The study also sought to qualitatively measure the levels of food security amongst the households. Food security occurs when “all people, at all times have physical and economic access to

sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (World Food Summit, 1996). The study used the hunger scale to assess food insecurity, assessed adequacy of food provision and dietary diversity.

The study found that there were more farmers (66%) who had access to improved markets (participant) who stated that they had adequate food provisions the past year than farmers from the non-participant (53%), see figure 2.37 below. This may be attributed to the fact that Musika interventions have encouraged farmers to increase their production, and as a result, they have enough produce to meet household food needs.

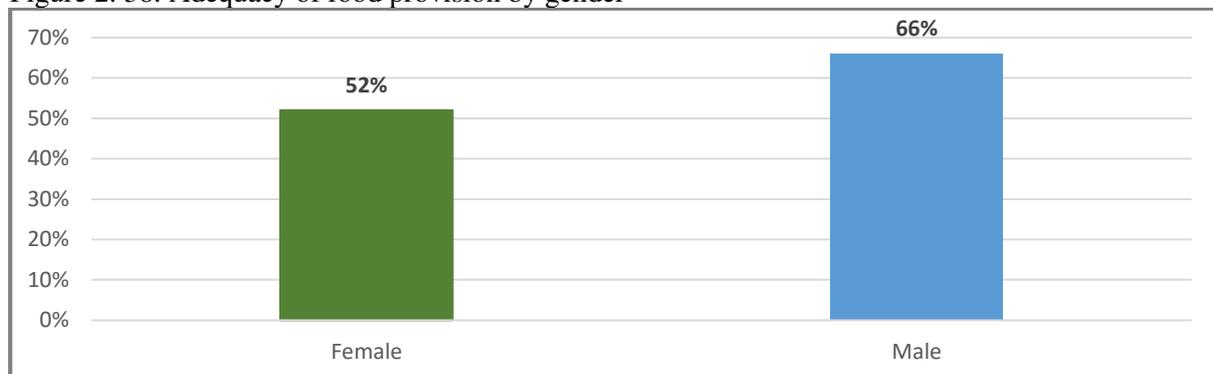
Figure 2. 37 Adequacy of food provision



Source: AHS 2018

It was further found that the majority of households who indicated adequate food provision were male headed (66%). This indicates that, less female-headed households have graduated from food insecurity than their male counter parts, see figure 2.38 below.

Figure 2. 38: Adequacy of food provision by gender



Source: AHS 2018

Household Dietary diversity

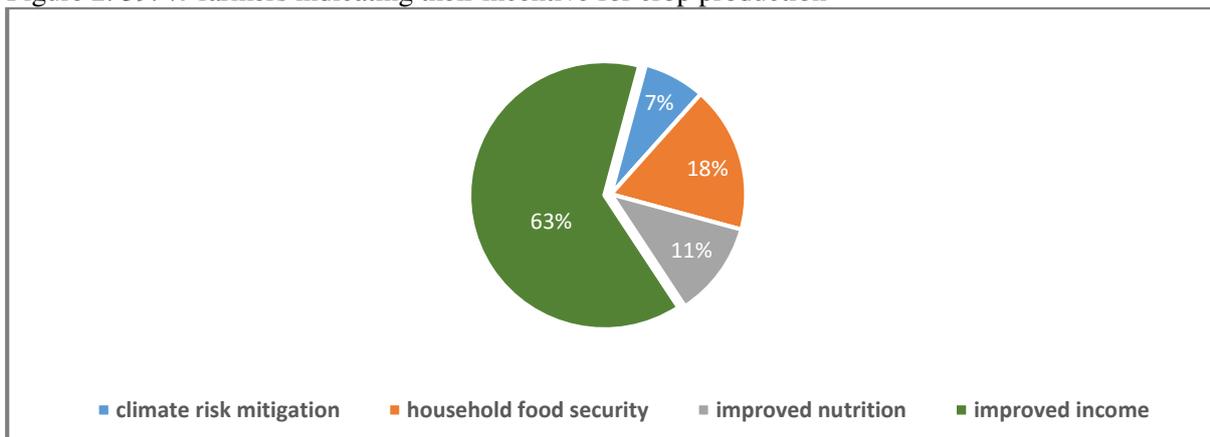
Different fruits, vegetables and other foodstuff provide different vitamins and minerals and in differing quantities. Dietary diversity is essential to ensure that all nutritional needs are met. Households were also evaluated on their dietary diversity regarding their consumption of food from four food groups: carbohydrates, fruits, vegetable and protein giving foods in the past normal 24 hours. An index was developed on which households were ranked on a scale of one to four. The study found that on average, 57% of the households consumed food from all the food groups. The participant group had about 61% of the households, which had consumed

foods from all the four food groups whilst 49% from the non-participant group had consumed foods from all the four food groups. The most consumed food was the carbohydrates (99%), and the fruits were the least consumed food (71%).

Nutrition as an incentive for crop diversification

This study also established that the majority of farmers had grown crops to generate an income, and the second most important incentive was food security, see figure 2.39 below. The growing of a variety of crops as means of supporting a diversified food consumption (or for nutritional improvement) is seen to be one of the main drivers of nutritional diversification (IFAD, 2015).

Figure 2. 39: % farmers indicating their incentive for crop production

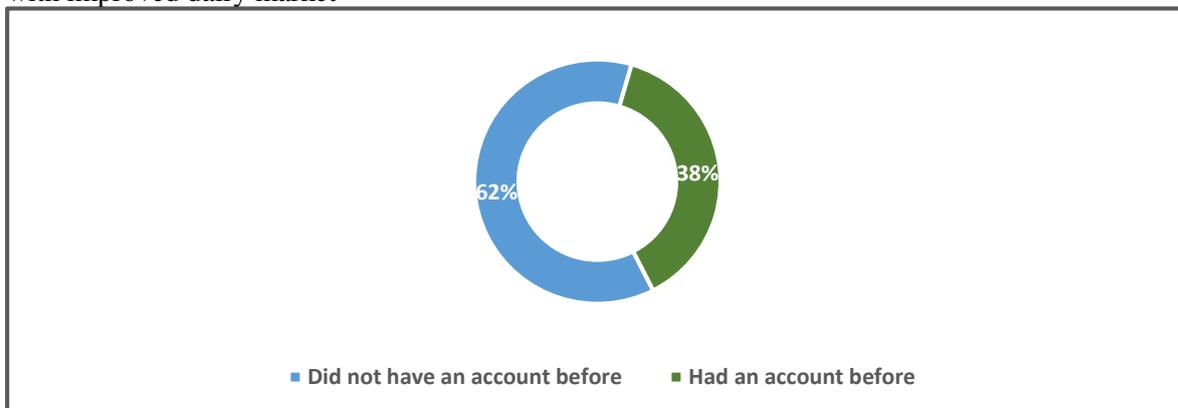


Source: AHS 2018

Financial Inclusion in Dairy Markets³

The study found that 43% of the dairy farmers were paid through a bank account in the 2017/2018 agricultural farming season. Thus improved dairy markets could play a part in financial inclusion as 62% of the farmers who received their money through a bank account stated that they did not have an account before they started selling their milk to improved markets, see figure 2.40 below.

Figure 2. 40: % farmers indicating whether they had opened a bank account before or after transacting with improved dairy market



Source: AHS 2018

³ This section had only captured Musika farmers.

3.0 Conclusions

The 2018 AHS was conducted to test Musika's theory of change albeit qualitatively. The survey exercise involved interviews with farmers from firms supported by Musika (participant group), and with farmers with no linkages with Musika supported firms (non-participant group). The survey targeted and captured 911 smallholder farmers across 6 provinces. Below were the key highlights from the study;

- Generally, more farmers with market linkages had obtained technical information than farmers from the non-participant group. The technical information had ranged from agronomic, veterinary drugs and services to price information as part of their transactions with agribusinesses. Moreover, the study established that farmers with improved market linkage had better understanding of the technical information received from the agribusinesses than farmers who did not have such linkages.
- It was further noted that the majority of the farmers in the participant group stated that they felt very confident in investing in their own production and compared to a minority in the comparison (non-participant group). Farmers with access to improved agricultural markets had generally developed a lot more confidence to invest in their own production through assured output markets and service provision from Musika partner firms as compared to farmers in the participant group.
- The study revealed further that there was a higher number of farmers indicating use of improved seed in the participant group than the non-participant group. Moreover, more farmers in the participant group stated to have observed an increase in the use of improved seed than farmers in the non-participant group. The use of agrochemicals was much more prevalent amongst farmers in the participant group than in the non-participant group. The uptake of improved technologies could be attributed to more farmers with access to improved markets observing an increase in the number of suppliers of inputs/products and services from the past agricultural season as than farmers in the non-participant group.
- Crop yield and calving rate was found to be higher amongst farmers in the participant than in the non-participant group. The study found that yields for farmers who were linked to improved markets were higher than for farmers who were not linked to improved markets. This posits improved markets as conduits for enhancing crop productivity. The better yields could be attributed to the dissemination of technical information to the farmers with improved market linkages. On the other hand, the better calving rates observed by the farmers linked to improved markets could be attributed to services accessed such as drugs and veterinary services.
- While farmers in the both the participant and non-participant group experienced increase in income due to their engagements in various agricultural markets, generally more farmers from the participant group noted an increase in their annual incomes, and this could be attributed the access to improved agricultural markets under Musika interventions. Access to improved market was found to correlate with improved income. This suggest that access to improved market leads to farmers realising a financial benefit.

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Annex

