Government of the Republic of Zambia

African Development Bank Group

Global Agriculture and Food Security Programme

Beneficiary Assessment and Mid-Term Review – Final Report

Agriculture Productivity and Market Enhancement Project
Ministry of Agriculture

Submitted by:

RuralNet Associates Limited

October 2018

Contents

ACROMYNS

7NDP	Seventh National Development Plan
APMEP	Agriculture Productivity and Market Enhancement Project
BAMTR	Beneficiary Assessment and Mid-Term Review
CAADP	Comprehensive Africa Agriculture Development Programme
CEO	Camp Extension Officers
DD	Dietary diversity
FAO	Food Agricultural Organisation
FBDG	food based dietary guidelines
FGDs	Focus Group Discussions
GAFSP	Global Agriculture Food Security Programme
GHI	Global Hunger Index
GRZ	Government of the Republic of Zambia
IGAs	income generating activities
JCTR	Jesuit Centre for Theological Reflection
KIIs	Key Informant Interviews
KPIs	Key Performance Indicators
LCMS	Living Conditions Monitoring Survey
LGA	Logical Framework Approach
MoA	Ministry of Agriculture
MTC	Ministerial Tender Committee
MTE	Mid-Term Evaluation
NAIP	National Agriculture Investment Plan
NEPAD	New Partnership for Africa's Develop
OECD	Organization for Economic Cooperation and Development
OECD	Organization for Economic Cooperation and Development
PAR	Project Appraisal Report
PCU	Project Coordination Unit
PD	Project Document
R-SNDP	Revised Sixth National Development Plan
SNDP	Sixth National Development Plan
SPHFSP	Southern Province Household Food Security Programme
SPRING	Strengthening Partnerships, Results, and Innovations in Nutrition Globally
SPSS	Statistical Package for Social Sciences
ToC	Theory of Change
ToRs	Terms of Reference
WHO	World Health Organization
ZDHS	Zambia Demographic Health Survey

Acknowledgements

The Review Team (RT) would like to thank all those who, in one way or another, contributed to the execution of the midline for the Agriculture Productivity and Market Enhancement Project (APMEP), and, consequently, to the creation of this report. The stakeholders have given us the necessary support and the team of research assistants is saluted for their part in the execution of the survey. Finally, all those interviewed are greatly appreciated for giving us their time and the information we needed without which this document would not have been created.

RuralNet Associates Ltd[1]

Lusaka, October 2018

[1] The Review Team consisted of; Mr. Stephen Tembo, Mr. Solomon Tembo, Ms. Dorothy Nthani, Mr. Solomon Ngoma, Mr. Jacob Chisha, Mr. John Kunda Ms. Rhoda Chiwele and Mr. Fison Mujenja.

EXECUTIVE SUMMARY

Introduction

Background

The Agriculture Productivity and Market Enhancement Project (APMEP) is a five year intervention whose implementation started in 2015. The project has a total budget of US$ 34.87 million of which 89.3% is financing from the Global Agricultural and Food Security Programme (GAFSP), 10.3% from the Government of the Republic of Zambia (GRZ) and 0.14% from beneficiaries. APMEP's main goal is to contribute to the country's economic growth through the National Agricultural Investment Plan (NAIP 2014-2018), implemented in the context of the 7th National Development Plan (7NDP) and the Vision 2030. APMEP's main objective is to contribute to poverty reduction by promoting household food, nutrition and income security in Southern province (Gwembe and Sinazongwe districts); Lusaka province (Chongwe and Rufunsa districts) and Central province (Serenje and Chitambo districts).

The project has three inter-linked components: (i) Agriculture Production and Productivity; (ii) Value Chain Development and Market Linkages, and; (iii) Institutional Strengthening. The total direct beneficiaries are expected to be 75,000 of which 45% would be women and 2.7% would be youths. Indirect beneficiaries along commodity value chains are expected to be 40,000. The project would create 450 skilled/ semi-skilled jobs and 2,200 unskilled jobs.

Methodology

The general methodological approach employed was the use of five evaluation criteria: design, relevance, effectiveness, efficiency and sustainability. Data collection was undertaken in the first half of 2018 using mixed methods (quantitative and qualitative). The quantitative survey had a total of 2,342 respondents of which 1,550 was the target population and 792 was a control population. On the other hand, the qualitative survey consisted of 89 Key Informant Interviews (KII), 28 Focus Group Discussions, and; 14 seasonality analysis sessions with community members.

Key Findings

Selected demographic and socio-economic characteristics

The female headed households who were sampled in the beneficiary population were 34.5% while those in the control sample were 29.4%. The average head of household age for the participant population was 46.7 and the corresponding age for the control population was 45.8. Based on a wealth index that was computed using a number of assets owned by households, Chongwe (32.8% households) and Rufunsa (24%) (both in Lusaka province) had the highest proportion of the richest households in 2013 and 2017 while Sinazongwe (9.3%) and Serenje

(16.5%) had the least. Sale of rain-fed crops, sale of livestock and gardening/irrigated agriculture were the 3 most cited sources of income in that order in both 2013 and 2017 by the beneficiary and control populations. The largest change in the proportion of households who cited various sources of income between 2013 and 2017 was in gardening, accounting for 36% (beneficiary population) and 33% (control). This was followed by sale of livestock at 25% (both beneficiary and control).

Design

The project design was aligned to widely acceptable principles of programming. The Logical Framework Approach (LFA) was used and well applied. The design of APMEP showed a clear link with the country's main development policies and frameworks, the key ones being: the NAIP (2014-2018); the First National Agricultural Policy; the Sixth National Development Plan, and the Vision 2030. APMEP was appropriate in addressing small scale farmers' needs given its focus on promoting food, nutrition and income security. Small scale farmers have serious challenges in these areas. With regard to the appropriateness of the assumptions, the assumption - *implementation of the project through government structures would be efficient* – has had a challenge as evidenced by the low project performance at Mid-Term Evaluation (MTE). The key contributing factors to the slow implementation progress include: lengthy procurement procedures and inadequate participation by the Ministry of Agriculture structures at various levels of implementation.

Relevance

APMEP's objectives relating to contributing to the country's economic development by stimulating higher smallholder agricultural productivity and production as well as job creation through the development of commodity value chains are still valid and suitable to the country's economic development agenda. APMEP's interventions have been designed to stimulate household food, nutrition and income security which would positively impact on the high rural poverty levels.

Effectiveness

An assessment of the overall progress in the KPIs contained in the Project Appraisal Report LFA has shown some positive movements in 11 of the 13 indicators at MTE. This is not withstanding the late project start and its slow implementation. This development points to two possible explanations: (i) the KPI target values were underplayed; (ii) the APMEP project design deliberately focused on those areas which had already gathered some level of momentum in terms of progress.

Generally, all the APMEP supported activities at district level (irrigation; aquaculture; crop diversification and intensification; livestock; nutrition; conservation agriculture; value chains and market linkages, and; institutional strengthening) have registered slow progress. Most of them are still dealing with preliminary activities of mobilization, identification of sites for infrastructure

constructions, stakeholder training and sensitization. However, the components that have made the most progress are; aquaculture and nutrition, in that order. In terms of aquaculture, 320,000 (2018) and 30,000 (2017) fingerlings have been distributed to recipients in Rufunsa, Serenje and Chitambo. On the other hand, vitamin A fortified maize seed has been distributed to target districts under the nutrition component as the main activity for the last three years. Also distributed was iron rich beans and orange fleshed sweet potatoes (only in 2016/17).

APMEP supported activities are beginning to be engaged upon at household level. For instance, there is a growing number of households who store their crops, who protect stored crops, who get a better price after grading, who sell rain-fed crops, who sell livestock and who are involved in gardening/irrigated agriculture. There is a gap between participant and control populations in a number of these indicators, including: those who sold crops (63% participants and 55% control) and; those who graded crops 53% and 47% respectively.

With regards to prevailing food and consumption patterns, the highly consumed food group was maize, ranging from 73% (Chitambo) to 97% (Gwembe) of households consuming it. The next highly consumed food group across all the districts was vegetables. An analysis undertaken to assess underweight, stunting and wasting among under five children showed mixed results. Among the control population, Gwembe (17.9%) and Rufunsa (16.7%) had the highest population of children who were underweight while Chitambo (5.3%) and Serenje (7.7%) had the least. On the other hand, the control district with the highest cases of underweight was Chilanga (14.7%) and the one with the least was Zimba (11.5%).

The target district that had the least proportion of the population that had wasted children was Chitambo (1.8%) while the most was in Rufunsa (7.6%). The corresponding figures for the control population were 2.4% (Ngabwe) and Chilanga (9.7%). The highest proportion of stunted children were in Chitambo (42.3%) followed by Rufunsa (37.5%) while Chongwe had the least at 22.5%. With respect to the control population, Ngabwe had the highest proportion of stunted children at 40.2% while Zimba had the least at 23.0%.

APMEP activities are increasingly involving women as noted in a number of KPIs disaggregated by gender. For instance, in terms of women participation in APMEP supported activities, the proportion of women in 5 out of 6 districts was higher than that of their male counterparts, with the largest gap between the two genders recorded in Chongwe (28% women compared to 8% men). On the other hand, Ngabwe (control district) had the largest proportion of men who were engaged in income generating activities (34% men compared to 8% women). Formation/mobilization of farmer groups/clubs by gender has also progressed well in the 6 target districts (see Appendix 1 for details by district).

Efficiency

Going by the relatively low disbursement rate of between 60% at MTE (with only one year to go), APMEP cannot be said to be efficient. There are two major contributing factors to APMEP's

inefficiency: (i) lengthy procurement procedures – about 80% of the project has some procurement aspects, and; (ii) slow disbursement rates arising from slow replenishments by target districts due to late submission of justification and reports.

Sustainability

The slow rate of implementation has compromised the effective delivery of project outputs and outcomes. Unless the situation improves, this will negatively impact sustainability, given that there will be no adequate project benefits to sustain. The implementation of the project through existing government structures is potentially meant to positively impact sustainability though currently this has resulted in slowed down implementation progress. APMEP has considerable emphasis on capacity building at all levels, particularly at the most critical implementation level – the community. By its nature, capacity building promotes sustainability through skills and expertise transfer. It also enhances competences of various stakeholders as they engage in project implementation.

Main Conclusions and Recommendations

1. The project has generally had a slow start due to a number of factors including the lengthy procurement procedures. Though some activities such as training, sensitization and farmer mobilization started in reasonably good time, their impact on the ground has been minimal because of the long gap between such activities and the delivery of equipment, facilities and materials to work with. It is ***recommended*** that adequate preparation for project kick-off be made for future programming. There should be a consideration of an inception phase of not less than 6 months to facilitate the undertaking of crucial pre-requisite activities including: procurement of machinery, equipment and services; preparation of infrastructure designs, and; establishment and operationalization of a PIU. It is further ***recommended*** that in the remaining project life (including the proposed extension period of 12 months), the Ministry of Agriculture in consultation with the other relevant wings of government consider decentralizing the procurement system to the provincial and district level, defined by specific thresholds.

2. The results chain/logical framework was well thought through which presents a strong and compelling business case. However, the actualization of this business case has not been easy on account of a number of assumptions which do not hold, ranging from capacity building not taking place at the expected time, inadequate operational resources, to value chains that have lacked adequate detail in terms of who are the key players at each stage of the value chain, what potential exists at each stage, what resources are needed and how much are available, etc. Going forward, it is r***ecommended*** that focus be on scaled down activities in a bid to optimize results .. The recommended sub-components to be

focused on in the remaining project life are: irrigation, livestock and crop diversification.

3. It is now that sufficient ground and preparatory work has taken place that would facilitate improvement in implementation progress. Given the relatively low disbursement rate (of 60%% with one year to go), it is not practical to utilize the remaining resources or a considerable proportion of them in the remaining one year period. It is ***recommended*** that Government, AfDB and GAFSP consider extending the project by at least 12 months from the official date of project closure. Government and its partners need to find resources to finance the extension in the event that the remaining funds get exhausted before the official project closure date.

4. Some selected indicators are beginning to bear fruit on the ground. These include increased expenditure on agricultural inputs and improved participation in the market related indicators. Going forward, it is ***recommended*** that these positive result areas be aligned to the proposed sub-components to be focused on in the remaining project life (i.e. irrigation, livestock and crop diversification).

5. Negative variability in food security related indicators is more pronounced due to ever changing climatic conditions. With the current global climate change events, it is expected that the country's climatic conditions will worsen in the short to immediate term. Going forward as a ***recommendation***, the situation calls for improving the integration of climate mitigation and climate adaptation measures into the three sub-components to be focused on in the remaining project life (i.e. irrigation, livestock and crop diversification).

PART I: INTRODUCTORY

1. INTRODUCTION

1.1 Background

The implementation of the Agriculture Productivity and Market Enhancement Project (APMEP) started in 2015 for a period of five years, with a total budget of US $ 34.87 million. The implementation of APMEP is through government structures with the Ministry of Agriculture (MoA) as the implementing agency on behalf of government. APMEP is jointly funded by the Global Agriculture Food Security Programme (GAFSP, 89.3%), the Government of the Republic of Zambia (GRZ, 10.3%) and beneficiaries (0.14%). APMEP is one of the initiatives that was meant to accelerate the implementation of the National Agriculture Investment Plan (NAIP 2014 – 2018) developed under the auspices of the Comprehensive Africa Agriculture Development Programme (CAADP), an initiative of the New Partnership for Africa's Develop (NEPAD).

APMEP was designed around three main inter-linked components aimed at full realization of its objectives and optimization of its results: (i) Agriculture Production and Productivity; (ii) Value Chain Development and Market linkages; and (iii) Institutional Strengthening. APMEP has two major categories of beneficiaries, direct and indirect. The total direct beneficiaries are expected to be 75,000 of which 45% (or 33,750) would be women and 2.7% (or 2,000) would be youths. The indirect beneficiaries along the commodity value chains are expected to be 40,000. APMEP is expected to create about 450 full time skilled/semi-skilled and 2,200 unskilled jobs in agri-business, crop production, processing and marketing through its facilitation of increased productivity and production and linking it to the value chain elements.[2]

1.2 Key Objectives of the Project

APMEP's goal is to contribute to the country's economic growth through the NAIP and the other development frameworks such as the Sixth National Development Plan and now the 7th National Development Plan which all contribute towards the realization of Vision 2030. Its main objective is to contribute to poverty reduction by promoting food, income and nutrition security among participating households in the six project target districts of Sinazongwe and Gwembe (Southern province); Chongwe and Rufunsa (Lusaka province), and; Serenje and Chitambo (Central province).

The two intermediate objectives are:

[2] For a detailed reading about APMEP, see GAFSP: Project Appraisal Report – Zambia, February 2014.

(i) To increase agricultural productivity of the participating farmers, and;
(ii) To increase agro-processing of the agricultural products of the participating farmers.

1.3 Key Objectives of the Beneficiary Assessment and Mid-Term Review

The main objective of the Beneficiary Assessment and Mid-Term Review is to assess the general performance of the project in achieving its objectives and make judgments whether the project should continue in its current form after three years of implementation. The specific objectives and other related details of the Beneficiary Assessment and Mid-Term Review are contained at in the Terms of Reference (ToRs) of the assignment (see **Appendix 8**).

1.4 Theory of Change

The Theory of Change (ToC) for APMEP is built on the premise that adequate budgetary allocation and capacity building will result in focused agricultural production and productivity, developed value chain and market linkages and strengthened institutions. These will further lead to increased agricultural productivity which will feed into agro-processing. This will in turn lead to improved food, nutrition and income security at smallholder farming household level with the inevitable contribution to increased agricultural GDP and a more diversified and resilient economic growth (see **Figure 1**).

For the ToC to be realized, certain critical assumptions need to hold, including: adequate and timely availability of financial and other critical resources; stakeholders are trainable leading to adequate productivity and production levels; continued government support to agriculture, and; that there is economic and political stability, among others (see **Figure 1** for details).

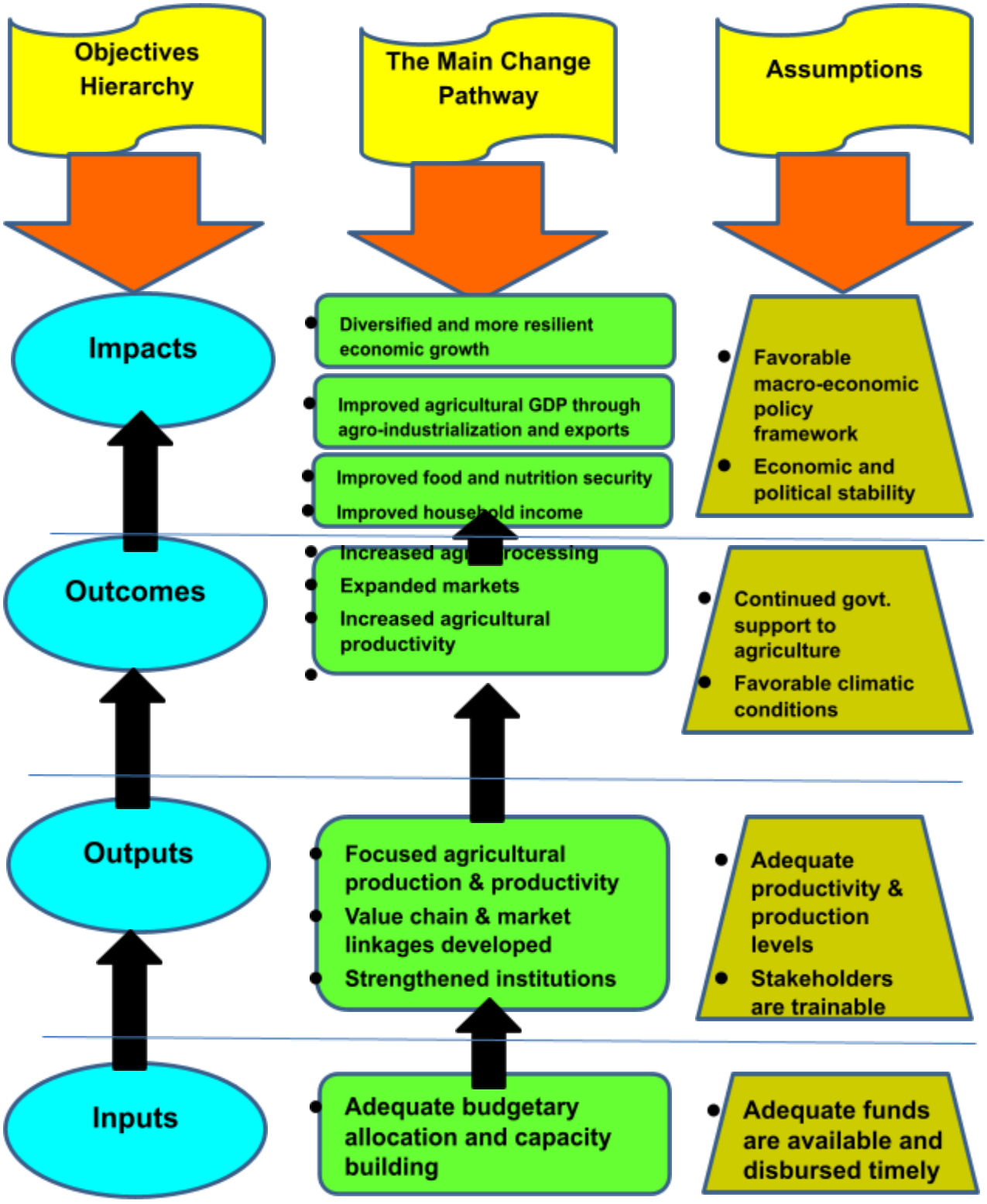

Figure 1: APMEP Theory of Change

2. APPROACH AND METHODOLOGY

2.1 General

The general methodological approach involved the use of globally accepted best practices in evaluation such as those by the Organization for Economic Cooperation and Development (OECD) five (5) evaluation criteria. The 5 OECD criteria used were: design, relevance, effectiveness, efficiency and sustainability which in main ways have defined the structure of this report. In the same vein, for data analysis, a globally renowned Statistical Package for Social Sciences (SPSS) was used.

2.2 Mixed Methods

Data collection was undertaken during April/May 2018 using mixed methods (quantitative and qualitative), a crucial factor to promoting quality, complementarity and completeness of the data collected. The issues investigated were summarized into three major categories: (i) General beneficiary assessments and Mid-Term Review; (ii) G, and; (iii) Nutrition security. Whereas both quantitative and qualitative methods were used to investigate all the three areas, their usage was complimentary. Consequently, qualitative methods sought bring out issues which were narrative and descriptive in nature. The two approaches were used concurrently in order to enhance effectiveness in the use of resources.

2.3 Baseline Conditions

The absence of a baseline evaluation paused a challenge in terms of appreciating the project beneficiary conditions which prevailed before project implementation. This means that it was not possible to measure the Key Performance Indicator values which would have then been tracked at midline in order to measure change in terms of the extent to which project objectives will have been realized between project start and midline. In order to estimate baseline conditions, control samples were employed. Within the limitations of the financial resource envelop, efforts were made to select control districts that were as similar as possible to the target districts in the three provinces where APMEP is under implementation.[3] There were three control districts for each of the three APMEP target provinces, namely: Chilanga (Lusaka province); Ngabwe (Central province), and; Zimba (Southern province).

[3] In case of Lusaka province, a control district which would have been more appropriate is Luangwa, given its similarities to the two target districts of Chongwe and Rufunsa particularly in terms of rurality. However, it was not practical to use Luangwa for a control district due to the relatively long distance, which would have been more costly, compared to the other districts in the province. In a bid to deal with cost issues, the evaluation team had to choose Chilanga rural, which as results of the evaluation have shown, proved unsuitable for a control district because it is more urbanized.

2.4 Key Performance Indicators

The Beneficiary Assessment and Mid-Term Review (BAMTR) has focused on the evaluation of the Key Performance Indicators (KPIs) in the Results-Based Logical Framework contained in the APMEP Project Document (PD), among other things. Other aspects of evaluation deemed crucial have been given their due attention, including those relating to the five OECD evaluation criteria; design, relevance, effectiveness, efficiency and sustainability.

2.5 Quantitative sampling

A total of 2,342 respondents were interviewed, of which 1,550 (or 66%) were a participant population while 792 (or 34%) were a control population. **Table 1** and **Figure 2** present sample sizes by category and district. A three-phased sampling approach was used involving; agricultural camp, community/village and households.

Table 1a: Quantitative Sampling Details

District	Control	Participant	Total
Chongwe	-	243	243
Rufunsa	-	268	268
Serenje	-	248	248
Chitambo	-	252	252
Chilanga	274	-	274
Ngabwe	249	-	249
Zimba	269	-	269
Gwembe	-	257	257
Sinazongwe	-	282	282
Total	**792**	**1550**	**2342**

2.6 Qualitative Sampling

Table 1b below presents details of the qualitative sampling by data collection tool used and by district. In all, there were 89 key informant interviews (KIIs), 28 focus group discussions (FGDs) and 14 sessions involving seasonality analysis (see **Table 1b** for details).

Table 1b: Qualitative Sample Sizes

District/Province	KII	Focus Group Discussions		Seasonality Analysis	
		Male	Female	Male	Female
APMEP PIU	4	-	-	-	-
MoA HQ	1	-	-	-	-
Lusaka Province	10	-	-	-	-

District/Province	KII	Focus Group Discussions		Seasonality Analysis	
		Male	Female	Male	Female
Central Province	5	-	-	-	-
Other	1	-	-	-	-
Gwembe, Southern	11	2	2	0	3
Sinazongwe, Southern	7	1	3	2	3
Chongwe, Lusaka	12	-	0	0	0
Rufunsa, Lusaka	7	1	1	0	0
Chitambo, Central	7	3	1	1	0
Serenje, Central	15	3	3	0	1
Ngabwe	6	2	1	-	-
Zimba	2	3	1	2	2
Kafue	1	-	1	-	-
Total	**89**	**15**	**13**	**5**	**9**

2.7 Stakeholder Review and Validation

From August to the end of November 2018, various stakeholders had the opportunity to peer review the MTR and BA Draft Report. This process culminated into a stakeholder validation Meeting on 29th November (see **Appendix 9**, Participants to the Validation Meeting). The process of stakeholder review and validation was meant to provide the required comments in order to strengthen and improve the quality of the document.

2.8 Limitations

The major limitation relates to a widened scope of work at mid-term compared to what was envisaged at baseline, given that the contract that was offered was meant for undertaking a baseline evaluation. For instance, the nutrition and gender audit components could not be comprehensively addressed on account of limited time and financial resources. Ordinarily, the gender and nutrition audits could easily have been stand-alone surveys, requiring separate platforms. In addition, the change from baseline to midline necessitated the use of a control sample. Due to limited resources, it was not possible to select the most ideal districts to serve as control. Another challenge relates to the inappropriate baseline values that were provided by the Ministry of Agriculture for the impact level Key Performance Indicators (KPIs) in the results

chain (particularly household income and crop production figures) which were at variance with those of the Central Statistics Office (CSO), the official source of statistics (see **Table 7** and **Appendix 11**). This presented a challenge in the assessment of implementation performance progress. However, every effort has been made to ensure a good mid-term evaluation within the cited constraints.

PART II: KEY FINDINGS

3. DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS

This chapter deals with the following selected demographic and socio-economic characteristics:

(i) Gender of household head;
(ii) Age of household head;
(iii) Household wealth status;
(iv) Livestock ownership;
(v) Major household average expenditure, and;
(vi) Sources of household income.

Each of the above elements is briefly discussed below in succession.

3.1 Gender of household head

Male headed households for the participant population accounted for (70.6%) and for the control (65.5%). Female headed household for the participant made up slightly more than one third (34.5%) and the control (29.4%).

3.2 Age of Household Head

Age does have a bearing on respondent's experience and skills base to effectively respond to development initiatives. Usually, the more mature the participant population the greater the likelihood for them to possess adequate experience and exposure to sufficiently and appropriately respond to development initiatives. The participant population (46.73) had a slightly higher average age compared to the control population (45.84). In case of participant districts, Chongwe had the highest average age at (51.80) followed by Chitambo and Gwembe at roughly (47) while Sinazongwe (41.66) had the youngest population (see **Figure 2**).

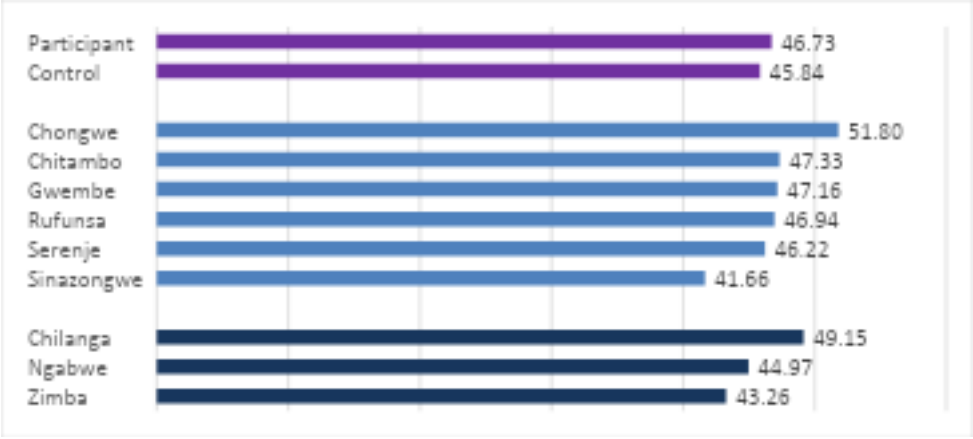

Figure 2: Average Age by Category and District

3.3 Household Wealth Status

A wealth index (WI) was created based on household assets ownership. The assets targeted in the computation of the WI included: bicycle, car, radio, television, stereo, house, fridge, mobile phone and an ox-drawn plough. The WI analysis focused on four WI quantiles, namely; poorest, middle, fourth and richest for the years 2017 and 2013, to facilitate a comparison between before project implementation and mid-term project conditions (see **Statistical Annex** respectively).

Out of the 6 APMEP beneficiary districts, Sinazongwe had the largest proportion of poorest smallholder farmers in both 2017 and 2013 at 37.8% and 35.6% respectively. These proportions were worse than what obtained in the control district of Zimba whose corresponding values for the two years were 27.8% and 28.4%. On the other hand, Chongwe had the largest proportions of richest smallholder farmers in the participating districts at 32.8% and 42.0% for 2017 and 2013. The corresponding values for the Lusaka province control sample (Chilanga) were 23.9% and 32.9% (see **Figures 3** and **4** and **Statistical Annex** for details).

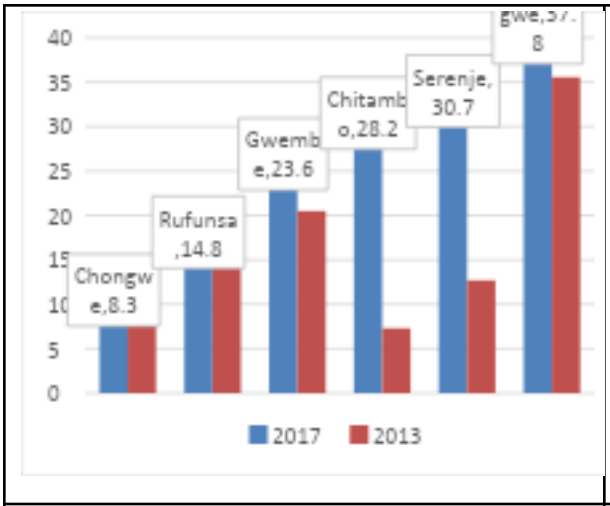

Figure 3a: Proportion of Poorest Households, Beneficiary districts

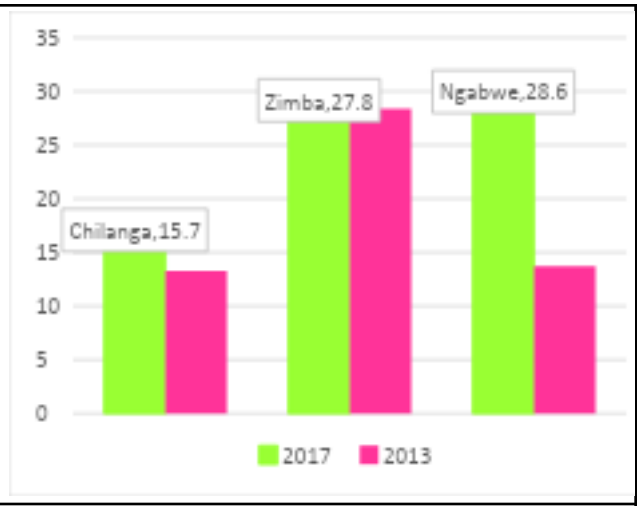

Figure 3b: Proportion of Poorest Households, Control districts

Whereas there was a slight drop in poverty levels in the two districts of Lusaka province between 2013 and 2017, for the rest of the APMEP participating districts the poverty levels worsened between the two periods. For instance, in Chongwe the proportion of the poorest smallholder farmers declined from 11.3% in 2013 to 8.3% in 2017. The corresponding figures for Rufunsa were 19.7% and 14.8%. On the other hand in case of Chitambo, the proportion of smallholder farmers that were poor rose from 7.3% in 2013 to 28.2% in 2017. In Serenje, the corresponding values were 12.7% and 30.7%. Ngabwe the control district recorded a similar increase in the proportion of the poorest smallholder farmers, from 13.7% in 2013 to 28.6% in 2018.

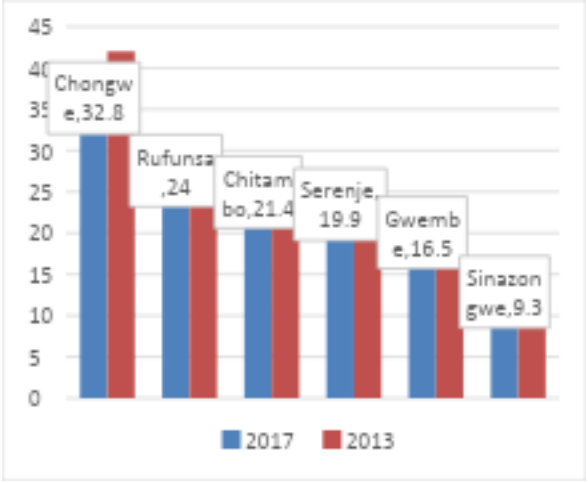

Figure 4a: Proportion of Richest Households, Beneficiary districts

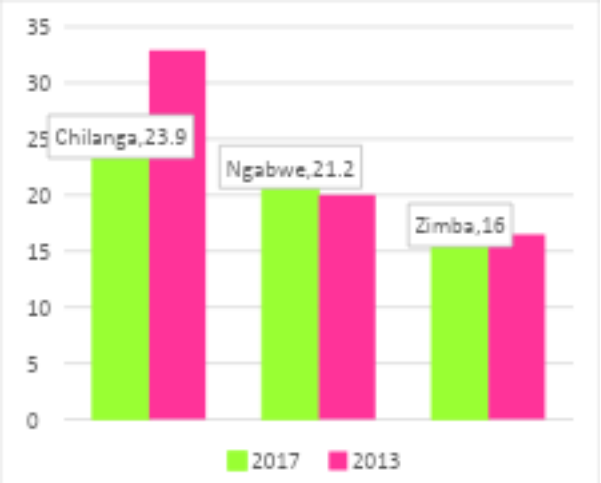

Figure 4b: Proportion of Richest Households, Control districts

The variation in the APMEP participating districts of Southern province (Gwembe and Sinazongwe) with respect to the proportion of the poorest households between 2013 and 2017 was less drastic compared to the districts in the other two provinces. For instance, in Gwembe the poorest smallholder farmers were 20.5% in 2013 compared to 23.6% in 2017. The corresponding percentage values for smallholder farmers in Sinazongwe were 35.6% and 37.8%. The control district recorded a slight drop in the proportion of the poorest households in the same period, from 16.5% in 2013 to 16.0% in 2017 (see **Figure 3**).

This variation in the proportion of the poorest between the Southern province districts on one hand, and Central province districts on the other, may be as a result of differences in farming systems between the two provinces. The smallholder farmers in Central province districts predominantly depend on rain-fed cropping for livelihood while their counterparts in Southern province districts substantially rely on livestock for their livelihood. Relative to cropping, livestock production is less affected by climatic (e.g. drought) and market (such as late delivery of inputs) variables which affected cropping in 2017.

3.4 Livestock ownership

Although there was an increase in terms of livestock ownership from 2013 to 2017, there were no noticeable differences across the population categories. In 2013, the proportion who owned livestock from the participant accounted for 16.8% compared to 16% for the control. An increase of nearly four percentage points was recorded for both participant (20.5%) and control (19.6%), see **Figure 5**.

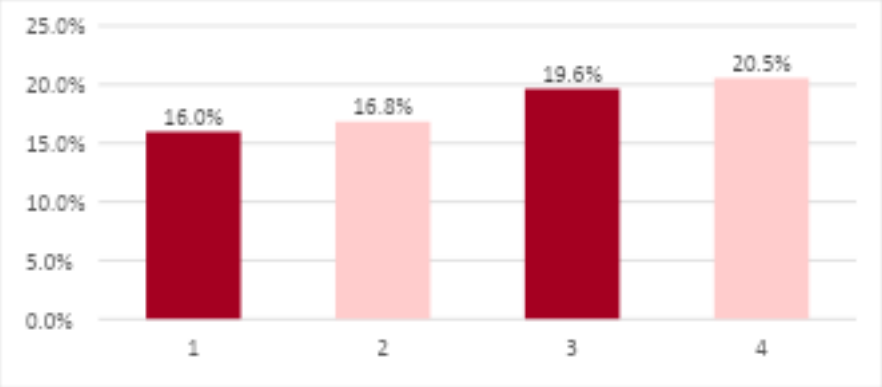

Figure 5: Proportion Who Own Livestock

The participant population (47.7%) owned more goats than the control (35.7%). Similarly, there was double the proportion of the participant (17.7%) who owned pigs compared to the control (8.7%). Conversely, nearly a third of control (31.6%) owned cattle compared to participant (21.5%). When it came to chickens, more than seven in 10 respondents owned chickens across the population categories; participant (79.3%) and control (74.6%), see **Figure 6**.

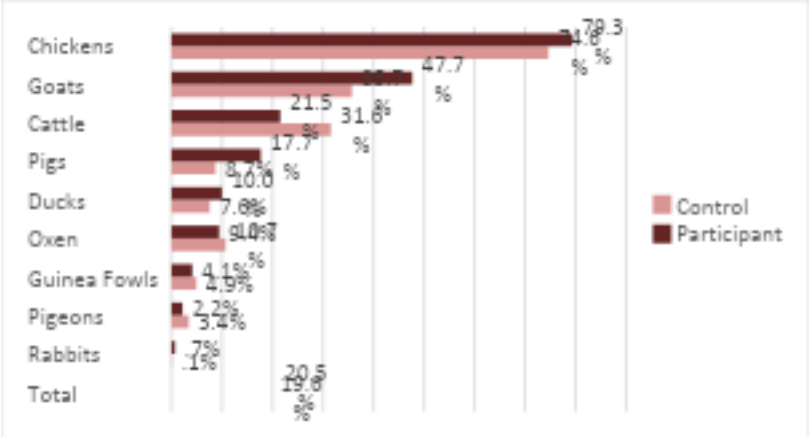

Figure 6: Proportion who owned livestock by type

3.5 Major household average expenditure

Food expenditure scored the highest both in 2013 and 2017 as well as across the population categories. The participant (ZMW 2401.22) spent more on food in 2013 compared to the control (ZMW 2162.77). A similar trend was observed in 2017 (participant ZMW 3123.09 vs. control ZMW 3045.05). Still, the participant (ZMW 2256.32) spent almost double the amount spent by control (ZMW 1161.06) on children education in 2017.

Table 3: Household average expenditure by category, 2013 and 2017

Expenditure category	2013		2017		% Change	
	Participant	Control	Participant	Control	Participant	Control
Children's educ.	1,324.93	753.76	2,256.32	1,161.06	70	54
Health	383.55	172.80	476.86	296.27	24	71
Food	2,401.22	2162.77	3,123.09	3,045.05	30	41
Agric. inputs	898.15	952.47	3,123.09	1,415.58	248	49
Total	**5,007.85**	**4,041.80**	**8,979.36**	**5,917.96**	**79**	**46**

An analysis was undertaken to determine the percentage change in household expenditure across the four categories and the two population groups. Overall, the average household expenditure by the participant population grew by one third (or 33%) more than the recorded increase in expenditure by the control population between 2013 and 2017 (analysis of **Table 3**). The greatest growth in household expenditure category by the participant population was on agricultural inputs, a growth of 248% (or 5 times the corresponding growth in the control population – see **Table 3** and **Figure 7** for details).

Increased spending on agricultural inputs is vital in stimulating growth in agricultural productivity and expanded markets leading to improved household food, nutrition and income security. This is in line with APMEP's objective of increasing smallholder agricultural productivity and production that would in turn facilitate their increased participation in market participation resulting in improvement in their household food, nutrition and income security.

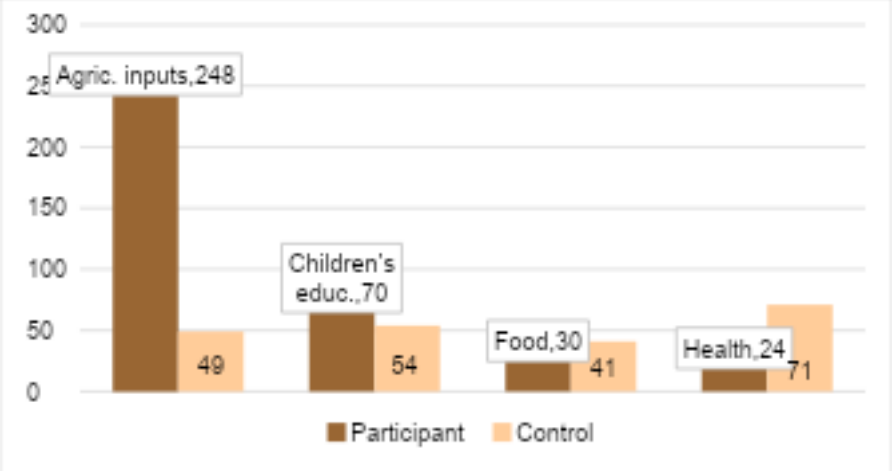

Figure 7: Percentage increase in household expenditure Between 2013 and 2017

3.6 Sources of Household Income

Sale of rain-fed crops ranked high as the most cited source of household income, both in 2013 and 2017 (see **Table 4**). The proportion who sold rain fed crops were higher for the participant population (48.1%) compared to the control (37.4%) in 2013. In 2017, more than half the participant population (52.5%) got their income from sale of rain fed crops while the control population accounted for (44.4%).

Table 4: Nine most cited sources of household income (% respondents)

Source	2013		2017		% Change	
	Participant	Control	Participant	Control	Participant	Control
Sale of rain-fed crops	48.1	37.4	52.5	44.4	9	19
Sale of livestock	25.3	17.8	31.7	22.3	25	25
Gardening/irrigated agriculture	25.9	16.7	31.5	20.1	22	20
Piece work	20.2	25.5	21.6	27	7	6
General trading (retail)	9.2	10.9	12.5	14.5	36	33
Fishing	11.2	11.1	12.4	10.7	11	-4
Fish mongering	6.1	2.4	7.2	2.7	18	13
Charcoal burning	4.8	7.6	5.7	7.1	19	-7
Bricklaying	4.1	5.3	3.9	7.2	-5	36

The three largest changes in the proportion of households involved in various activities as sources of income between 2013 and 2017 for both participant and control populations were: general trading (retail); sale of livestock and gardening/irrigated agriculture. The respective changes were: 36% participant and 33% control (general trading/retail); 25% for both participant and control (sale of livestock), and; 22% participant and 20% control (gardening/ irrigated agriculture), see **Figure 8.**

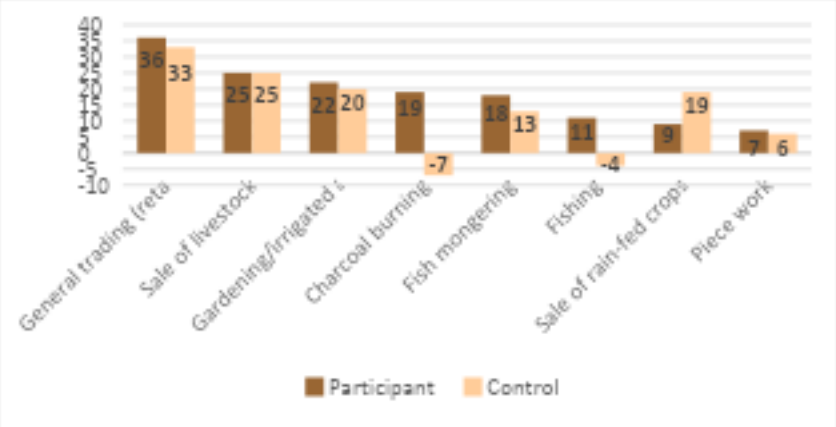

Figure 8: Percentage change in household income sources Between 2013 and 2017

The change in sale of rain-fed crops was the least after piece work in case of the participant population (9%) although for the control population the change was reasonably high (20% or nearly one fifth).

4. DESIGN

Design: *is concerned with the manner the project was constructed. It focuses on such issues as: alignment to widely acceptable principles; linkage to country policies and development frameworks; Appropriateness of the project to beneficiary needs, and; Appropriateness of assumptions. The performance of a project/programme may be negatively or positively affected by the manner it was designed and hence the need to undertake an assessment of APMEP design at mid-term evaluation.*

There are five major elements under design which have been assessed in this chapter and are discussed in succession:

(i) Alignment to widely acceptable principles;
(ii) Linkage to country policies and development frameworks;
(iii) Institutional assessment;
(iv) Appropriateness to beneficiary needs, and;
(v) Appropriateness of assumptions.

4.1 Alignment to Widely Acceptable Principles

The project was aligned to widely acceptable principles as evidenced by the following three major ways. *First,* the planning process followed the Logical Framework Approach (LGA) which is one of the most used tools for project design globally. There is evidence that the following 9 LGA steps were undertaken: context analysis; stakeholder analysis; problem analysis; objective analysis; plan of activities; plan of resources; indicators; risk analysis and management, and; assumptions. *Second,* the overall objective was clear and so were the development or immediate objectives. These were linked to the Sixth National Development Plan (SNDP) which was running at the time. *Thirdly* and lastly, the intervention logic of the LGA was well articulated, with clear causal-effective relationship between one objective hierarch level and the next. Consequently there is a clear thread from activities, to outputs, outcomes and impacts.

4.2 Linkage to Country Policies and Development Frameworks

The design of APMEP took into account the prevailing country's major development frameworks and policies, the key ones being:

(i) The Vision 2030;
(ii) The Sixth National Development Plan (meant to operationalize the Vision 2030)
(iii) The First National Agricultural Policy, and;
(iv) The National Agricultural Investment Programme.

APMEP's key linkages to the country's major development frameworks are summarized and presented in **Table 5**.

Table 5: APMEP's Linkages to the Country's Main Development Frameworks

Policy/ Development Framework	Selected Key Areas of Focus	Link to APMEP Main Objectives, Strategies and Key areas
Vision 2013	• Attaining and sustaining high levels of economic growth and wealth creation	• The purpose of APMEP is to contribute to economic growth and poverty reduction by ensuring income, food and nutrition security among beneficiaries.
	• Increased value chain development in agriculture	• One of the key focus areas of APMEP is value chain development and market linkages.
Sixth National Development Plan (2011 - 2015)	• To increase and diversify agriculture production and productivity so as to raise the share of its contribution to 20 percent of GDP	• Increased agricultural productivity, including: (i) average crop yield (mt/ha); average livestock off-take per year (number); (ii) Increased agro-processing targeting: proportion of primary products processed locally by men and women; value of processed products by women and men.
	• Support crop diversification, livestock & fisheries production, increased productivity in crops & livestock, sustainable land and water management.	• Agricultural productivity and production enhancement primarily through the following: (i) Operationalization of effective and efficient irrigation schemes; (ii) Development of aquaculture; (iii) Promoting the growing of a wider variety of crops; (iv) Enhancement of livestock development and production. • Value chain development and market linkages through the following specific areas among others: (i) Establishment of efficient agro-processing infrastructure; (ii) Development of efficient market linkages.
	• Implementation of predictable, rule-based market & trade policies & strengthen public-private coordination & dialogue	• Development of efficient and effective market infrastructure to facilitate sale of agricultural products of a wide.
• The National Agriculture Investment Plan (NAIP, 2014-2018), launched in May 2013	• Agricultural Production and Productivity Improvement targeting; Crops, Livestock and Aquaculture	• Increased agricultural productivity, including: (i) average crop yield (mt/ha); average livestock off-take per year (number); (ii) Increased agro-processing targeting: proportion of primary products processed locally by men and women; value of processed products by women and men.
	• Market Access and Services Development	• Value chain development and market linkages through the following specific areas among others: (i) Establishment of efficient agro-processing infrastructure; (ii) Development of efficient market linkages.
	• Food and Nutrition Security and Disaster Risk Management	• APMEP's objectives are to contribute to economic growth and poverty reduction by enhancing food, income and nutrition security, among participating households.
	• Knowledge support systems	• Improvement of project management • Establishment of M&E system
The National Agricultural Policy Final Draft (2012 – 2030), August 2011	• Promote sustainable increase in agricultural productivity of major crops with comparative advantage;	• APMEP is a stand-alone investment Project aimed at development of irrigation and aquaculture, promotion of crop and livestock production and productivity, agro-processing and value addition, market linkages, men, women and youth participation and enhancement of household income, food and nutrition security
	• Continuously improve agricultural input and product markets so as to reduce marketing costs and increase profitability and competitiveness of agribusiness	

4.3 Institutional Assessment

An assessment of the eight (8) institutions and entities involved in implementing APMEP was undertaken using a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis. These are listed below:

(i) Ministry of Agriculture (MoA) Head Quarters (HQ);
(ii) Ministry of Justice (MoJ);
(iii) Subject Matter Specialists (SMS);
(iv) Ministerial Tender Committee (MTC);
(v) Provincial Agricultural Coordinator's Office (PACO), MoA;
(vi) District Agricultural Coordinator's Office (DACO), MoA;
(vii) Program Implementing Unit (PIU), and;
(viii) Community Members/ Smallholders

Various ***strengths*** were identified regarding the institutions based at national level the key ones being: overall decision making mandate and policy formulation (MoA HQ); Standardized assessment procedures and easier coordination and supervision due to a centralized system (MoJ); Good international exposure and centralized position for effective supervision and coordination across the 3 APMEP target provinces (SMSs); Existence of laid down government procurement procedures (MTC), and; a mixture of skills base, expertise and experience from government and the private sector (PIU). In terms of sub-national level institutional strengths, the ones that came out as major included: Strategic position for effective supervision and backstopping of district level activities (PACO); Closer to grass-root project activities and good knowledge of the project target groups/communities (DACO); Knowledge of own needs, environment and available local resources (Community members/ smallholders). These strengths across the various levels of APMEP implementation levels complement each other well and can be leveraged to strengthen project performance.

There were clear notable ***weaknesses*** across the various levels of project implementation which need to be addressed in order to improve project performance. These ranged from: difficult to monitor and supervise due to the absence of an effective Monitoring and Evaluation system and limited human resource capacity (MoA HQ and MoJ); High staff turnover (SMSs); Infrequent meetings to review submitted procurement documents (MTC), and; weak linkage with the national and district level (PACO). Others were: weak coordination among APMEP implementing departments (DACO); insufficient/lack of knowledge of unfelt needs and limited knowledge of the scope of the project (Communities members/smallholders).

Notwithstanding the identified strengths and weaknesses, APMEP's implementing institutions also had a number of ***opportunities*** which could be exploited for improved project performance. These varied from: Strategic fostering of synergies and networks with other relevant government ministries and institutions (MoA); Decentralization of human resource aimed at improving procurement efficiency (MoJ); Integrating of supervision, monitoring and backstopping into the Annual Work Plan and Budget – AWPB (SMSs); More active participation in monitoring

visits of project activities (MTC); Dedicated staff for project implementation (PIU); Strategic position to facilitate linkages and lesson learning across project districts (PACO); Maximization of project performance through strengthened coordination (DACO), and; Diffusion of project activities and experience to non-project target group (Community members/smallholders).

Factors that could be disastrous to APMEP performance were identified along side strengths, weaknesses and opportunities. These factors or ***threats*** were wide ranging, such as: dependence on subordinates for knowledge about APMEP performance (MoA HQ); the temptation to lower standards on account of the huge workload (MoJ); Poor technical performance of the project due to inadequate backstopping (SMSs) and; Failure by project to realize its objectives arising from long procurement delays (MTC and MoJ). Others were: Increased undermining of APMEP sustainability due to poor linkage (PACO); Too much time spent on reporting at the expense of other project work (DACO), and; Loss of interest in the project due to long delays between training and delivery of inputs and facilities (Community members/smallholders). See **Appendix 10** for details.

4.4 Appropriateness to Beneficiary Needs

There are three major elements that underscore the appropriateness of APMEP to the needs of beneficiaries. *First,* the small scale farmers in Zambia have been characterized by low production and productivity. This has been one of the major constraints to their effective market participation given that they have not produced enough for sale. *Second*, and linked to the first point, APMEP seeks to increase market participation of small scale farmers through market infrastructure development. This is aimed at increasing the range and quantities of products to be sold. *Third,* the emphasis of APMEP on value chain development is meant to facilitate small holder participation in the various stages of the chain. This is expected to promote value addition to the primary products small scale farmers are most involved with. Value addition in turn promotes household income security which impacts positively on poverty reduction.

Nonetheless, the focus of APMEP was over-ambitious, targeting virtually all components of the NAIP. This has resulted in the spreading of resources thinly which in turn has led to a reduction in impact. Another challenge is that at the time of project design, the implementing agency was one entity, i.e. the Ministry of Agriculture and Livestock. However, the ministry was later split into two entities, i.e. the Ministry of Agriculture and the Ministry of Fisheries and Livestock. In the meantime, the funding and procurement arrangements remain with the Ministry of Agriculture. This has negatively impacted on the smooth implementation of the project in a number of ways including those entities under the Ministry of Fisheries and Livestock not being able to access funding directly.

4.5 Appropriateness of Assumptions

There were five main assumptions that were made at project design stage, namely;

(i) Political and economic stability,

(ii) Continued government support to agriculture,
(iii) Community cooperation,
(iv) Favourable climatic conditions, and
(v) Implementation through government structures would be efficient.[4]

A brief discussion of the extent to which the assumptions were appropriate is presented in

Table 6: Appropriateness of Assumptions

Assumption	The extent to which the assumption was appropriate
Political and economic stability	● This assumption has held. The political environment has been stable as well the economy. ● One of the economic stability indicators is the annual inflation rate which has averaged 7.80% since 2014 to date. It reached an all-time high at 22.9% in February 2016. In 2017, the average annual inflation rate was 6.58%[5]
Continued government support to agriculture	● At macro level, this assumption has held as evidenced by statements in the country's main development frameworks about the agricultural sector being an engine in driving the country's economic growth. This emphasis is contained in a number of development framework documents including the Revised Sixth National Development Plan (R-SNDP), the 7NDP.and the 2018 Budget Speech by the Minister of Finance.
Community cooperation	● The community has largely cooperated. This is not withstanding anxieties a number of communities have expressed on account of delayed implementation of project community level activities.
Favourable climatic conditions	● Some agricultural activities have been negatively affected by adverse climatic conditions. For instance, the pass-on initiative related to orange maize performed poorly in the 2017/2018 agricultural season due to the dry spell that was experienced in most parts of the country in December 2017.
Implementation through government structures would be efficient	● Implementation of APMEP project activities has not worked well in a number of areas including procurement of equipment; stakeholder sensitization; supervision and backstopping of project activities by especially provincial and district level staff. ● The above challenges have been as a result of a number of factors including: (i) The Ministry of Agriculture staff have other responsibilities, resulting in inadequate time allocated to APMEP activities; (ii) Some members of staff at district level have not always been motivated to apply themselves to APMEP activities due to perceived insufficient direct benefits/incentives the project offers; (iii) The government procurement system has a number of procedures which are lengthy and have been difficult to deal with, including erratic scheduled meetings for the Ministerial Tender Committee, lengthy procurement process. ● Linked to the above, the Subject Matter Specialists at National Level who according to the project design are part of the Project Implementation Unit (PIU) do not always have the luxury of time to provide the APMEP implementation process the full attention it requires. The contracted members of the PIU do not have adequate flexibility to move the implementation process as they would like.

[4] Except for the fifth assumption which is contained in the narrative of the Project Appraisal Report (February, 2014) all the other listed assumptions are found in the Results-Based Logical Framework.
[5] https://www.google.co.zm/search?q=zambia%27s+inflation+rate

5. RELEVANCE

Relevance: *Is the extent to which the project is suitable to the priorities and needs of the target group, recipient government and funding agency. In evaluating the relevance of a project, it is helpful to consider the following questions: To what extent are the objectives of the project still valid? Are the activities and outputs of the project consistent with the intended impacts and effects of the project? An assessment of relevance at Mid-Term Evaluation is vital given the importance of the project delivering results to the target population.*

This chapter deals with two major issues in sequence, namely;

(i) Validity of APMEP objectives, and
(ii) APMEP' suitability to the country.

5.1 Validity of APMEP Objectives

APMEP's main objectives are to contribute to the country's economic development and poverty reduction by ensuring food, income and nutrition security. Zambia has set herself to become a higher middle income country by 2030.

This requires that the country pursues a vigorous ***economic development*** agenda that encompasses and prioritizes key sectors to serve as engines of economic growth. Agriculture is well placed to significantly contribute to the country's economic development agenda, given its high potential and the relatively large proportion (more than 60%) of the population who depend on agriculture related livelihoods.

Poverty levels are still relatively high in the country. According to the 2015 Living Conditions Monitoring Survey (LCMS), 40.8% of Zambians live in extreme poverty. The proportion of the rural poor is far much higher at 76.6% compared to the urban poor at 23.4%. These high statistics demonstrate the necessity for APMEP which among other things, seeks to contribute towards the country's ***poverty reduction*** efforts. The average period for household food scarcity was estimated at 2.97 months by the Mid-Term evaluation. This is a long period for households to go without reasonable food supplies. It underscores the need to improve ***household food security***, one of the areas of emphasis by APMEP.

The national level average monthly rural income is still relatively low, estimated at ZMW 810.00 (2015 LCMS). Based on the 2018 APMEP Mid-Term Evaluation, the control population's average ***household income*** level was just over ZMW 950 per month while that for the target

districts was just over ZMW 1,200 per month.[6] These income figures are low, given the estimated average food basket of ZMW 5,000 per family (JCTR, June 2017). One of the major areas of focus by APMEP is improving household income security through increased production, market participation and value addition. Household ***nutrition security*** is a serious issue particularly among under five children. The children in this age bracket who were stunted were as high as 50% in rural areas (2015 LCMS). The APMEP Mid-Term evaluation findings had equality high proportion of children under five who were stunted, ranging from 22.5% in Chongwe to 42.3% in Chitambo. Again, this is a demonstration of the need for APMEP to focus on household nutrition.

5.2 APMEP's Suitability to the Country

This assessment is at two levels: (i) Suitability of APMEP to the needs of the target group, and; (ii) Suitability of APMEP to Government of the Republic of Zambia (GRZ).

5.2.1 Suitability of APMEP to the Needs of the Target Group

APMEP focus on household food, income and nutrition security makes the programme highly relevant to the rural farming households who grapple with these very issues. These issues are at the core of poverty which in rural areas is as high as 76.6% as alluded to above. APMEP seeks to increase the productivity and production of rural farming households, increase their market participation as well as involvement in the various stages of the value chain. This is deemed to be a more sustainable way of dealing with rural poverty as it links farmers to private sector players as opposed to government handouts.

5.2.2 Suitability to the Government of Zambia

APMEP is highly suitable to supporting the acceleration of Government development initiatives in the agricultural sector. The project evolved from NEPAD's supported CAADP, an African Union's initiative domesticated at country level. The CAADP processes in Zambia culminated in the development of the first generation of the National Agricultural Investment Programme (NAIP 2014-2018). APMEP is a direct response to the implementation of NAIP and the actualization of its goal and objectives, anchored in the Revised Sixth National Development Plan, and now the Seventh National Development Plan (7NDP), all contributing towards the realization of the country's Vision 2030.

[6] The control sample presents estimated baseline conditions for the APMEP districts.

6. EFFECTIVENESS

6.1 Overall Achievements of Key Performance Indicators

A summary of Key Performance Indicators (KPIs) in the Project Appraisal Report (PAR) is presented in **Table 7**. The KPIs are in three hierarchical categories, from bottom up; outputs, outcomes and impact level. As is the case with respect to international best practice, the data for the higher level indicators (outcomes and impact) were collected using a quantitative survey instrument. On the other hand, the lower level indicator data (outputs) were collected using Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) targeted primarily at district level key informants as well as from the Project management information system. In the absence of a baseline evaluation, the control sample presents an estimate of conditions that prevailed during baseline.[7]

An analysis of **Table 7** shows that 11 out of 13 KPIs registered a positive movement, with 9 of them reaching the 2022 target values. Given the slow start of activities on the ground as discussed in **Sections 4.4** and **7.2**, these KPI value results seem to be too good to be true. This suggests two possible explanations: (i) the KPI target values (ambition levels) were underplayed hence they were set at lower levels than should have been the case; (ii) The project design could have deliberately focused on those areas with the highest potential and whose progress had already gathered momentum. There could have been a number of factors that had already gathered momentum before project start which could have accelerated the positive performance of the KPIs.

Table 7 and **Appendix 6** provide a good picture of project achievements at midterm as measured by the Project's Key Performance Indicators at all levels of the objective hierarchy. These key performance indicators are contained in the Project's Results-Based Logical Framework (Project Matrix). The impact level objective had 3 performance indicators: average household income (USD/year), average months/year of household food scarcity and percentage of malnutrition (stunting) in under-5 children (%). The values of two of the three impact indicators were above the project completion target. Average household income was USD 1512, against a project completion target of USD 500, while percentage of malnutrition (stunting) in under-5 children was at 32%, against a project completion target of 40%. However, average months per year of household food scarcity did not change from baseline, in fact, it shows a downward tendency – from 5 months at baseline to 5.05 months at midline. For this indicator, the higher the indicator value, the worse the project performance.

[7] Given that the results chain KPI values in the PAR are estimates, the best practice is to update these values using the baseline figures once the baseline has been finalized. Assuming that there were no similar projects in the control sample, the control sample results at MTE represent baseline conditions as already alluded to. In this regard, the income and months of food scarcity values for the control sample have been indicated in blue colour in Table 7, representing baseline values.

Table 7: Summary results based on Results Chain Key Performance Indicators

	SN	Indicators	Baseline	Target	Mid-Term	% Change
Impact	1	Average h/hold income (US$/year)	**2013** 364 1,167	**2022** 500 1,218	**2018** **1,512** 1,512	 315% 30%
	2	Average period of h/hold food scarcity (months/year)	5 4.5	3 3	5.07 5.07	1% 13%
	3	Malnutrition (stunting) in under-5 children (%)	45	40	32	-29%
Outcomes	1	Average crop yield (MT/ha).	**2013**	**By 2020**		
		Maize	2.0	3.6	1.6	-20%
		Cassava	9.0	12.0	-	-
	2	Average livestock off-take per year (no)[8]			9,368	368%
		Goats	2,000	3,900		
		Poultry	100,000	250,000	37,472	-63%
	3	Primary prodts processed locally by women & men-%	10	30	7.2	-28%
		Value of processed prodts by women & men (ZMW)	500	2,000	-	-
Outputs	1	Scheme area (project area) under irrigation (ha)	**2013** 410	**2019** 3,337	2018 0	-
	2	Beneficiaries (# farmers) [At least 45% women-all activities]	2,050	14,565	23,953 (11,617-F)	1,068%
	3	No of scheme management entities (WUAs in this case)	0	10	9	
	4	Fish pens (no.)	0	280	0	
		Fish cages (no.)	0	340	0	
		Fish production (MT/year) [At least 45% women-all activities]	120	400	-	
	5	Area under conservation agriculture (ha)	25,430	32,730	12,126	-52%
		Seed supplied (pockets)	0	13,500	16,906	
		Area under mechanized agriculture (ha) [At least 45% women-all activities]	47,200	69,000	9,876	-79%
	6	Livestock pass-on scheme women/youth groups (No)				
		Women	0	60	48	
		Youth	0	10	4	
		Poultry keeping groups (No)	0	120	31	
		Women (%)	0	80	0	
		Youth (%)	0	10	0	
	7	Maize mills (no.)	0	2	0	
		Cassava mills (no.)	0	2	1	
		Community level-processing equipment (no.)				
		Honey presses	0	40	40	
		Solar dryers	0	70	20	
		Reduction in cassava and maize losses (%) [At least 45% women-all activities]			0	
		Cassava	4	2		
		Maize	12	8	0	
	8	Agriculture service centres (no.)	0	6	0	
		Roadside markets (no.)	310	327	0	
		Length (km) of rural feeder roads rehabilitated	0	50	0	
		Agro-dealers supported (no.) [At least 45% women-all activities]	0	60	0	
	9	Household trained in nutrition activities (No)				
		FHHs	400	550	513	28%
		MHHs	210	1,210	15	-93%
	10	Infants (6-24 months) on feeding programme (No)	0	1,600	180	
	11	Farmers trained, based on needs assessment (No), At least 50% women	0	16,800	14,500	

[8] These figures are estimates based on extrapolation from what was obtained during the Mid-Term Review. The actual figures are being awaited from the National Information Centre – Ministry of Fisheries and Livestock who are yet to compute the off-take figures by district. The Centre has a few years to work on.

	SN	Indicators	Baseline	Target	Mid-Term	% Change
	12	MAL GAFSP Project Technical Team supported (No)	0	1	>100	
	13	M&E system established & operational (No)	0	1	1	

The average household income and maize production values compare well with the LCMS (CSO) results (see **Appendix 11**). Paradoxically, the three indicators at outcome level all show a less-than desired project performance. Yields were lower than baseline estimates, the average livestock up-take was worse at midline than at baseline, and the percentage of primary products processed locally by women and men was equally less than baseline values. Ideally, positive (or negative, as the case may be) performance should cascade through the levels of the objective hierarchy in a logical manner. The break in the logical performance relationship between the outcome level and the impact level objectives indicate that there were other, perhaps more important, factors external to the project that influenced the project impact (which reveal significantly better performance than the outcome level).

Results at the output level reveal a somewhat mixed picture – there was some good progress in the achievement of some output level objectives and some less-than desired performance on others (see **Appendix 6**). Thus, under agriculture production and productivity, 3,122 hectares of land have been leveled against a 2019 target of 3337 (nearly 93%) but beneficiaries have not yet started using the irrigation scheme as it is not yet operational. In aquaculture, two of the three planned outputs have not been delivered. Thus, there are no fish pens and no fish cages, though 2.5 metric tons of fish have been produced so far (against a target of 400 metric tons in 2019). According to stakeholder consultations and programme management reports, fish pens and fish cages are being shipped to Zambia and are expected to be in the country by August, 2018. Area under conservation agriculture (crop diversification) was 12,151 at MTR against a target of 32,730 hectares (from a 2013 baseline of 25,430 hectares). Livestock development is progressing well, with the number of livestock pass-on scheme women/youth groups formed at 80 (71 women and 9 youth), against a baseline value of zero and a 2019 target of 70 (60 women and 10 youth), and the number of poultry keeping groups is at 65, against a baseline value of zero as well a target of 120 (see **Appendix 6** for details).

6.2 Overview of Component and Sub-comment Progress

An overview of component and sub-component physical and financial progress is presented in **Table 8**. In general terms, all the three components and their respective sub-components have made some progress albeit at varying levels. Among the sub-components that have made the most progress are the nutrition security and capacity building. Activities on the ground have gathered considerable momentum: Training of farmers and to a lesser extent extension staff has been conducted across the project areas covering various aspects including irrigation, aquaculture, crop and livestock production, food processing, preservation and utilization. However, individual district uptake of the trainings were at varying levels depending on their propensity to adopt. For example, different districts highlighted poor rains, irregular supply of orange maize to enable uptake of the orange maize utilization.

Furthermore, adoption of caterpillar utilization into the usual diet suffered a drawback in the Southern Province project areas. This is on account of the fact that the majority of the beneficiaries were Seventh-day Adventists who don't eat caterpillars on account of religious reasons. Seemingly, acceptance of this food item as a permissible food item despite its high nutritional value was not taken into account at the project implementation stage. Other activities on the ground that have gathered momentum include; distribution of food stuffs and equipment; women groups have been mobilized; bicycles for volunteers have been distributed and communities are using the knowledge acquired through training in the preparation of some food stuffs. Orange maize and beans enjoyed special acceptance across all the project areas (see **Table 8** and **Appendices 1, 5** and **6** for details).[9]

In terms of budget performance, the Agriculture Production and Productivity (Component I) had the highest, at 69% disbursement, followed by Value Chain Development and Market Linkages (Component II) at 51% while Institutional Strengthening (Component II) had the least at 41% (see **Figures 9 a** and **b**).

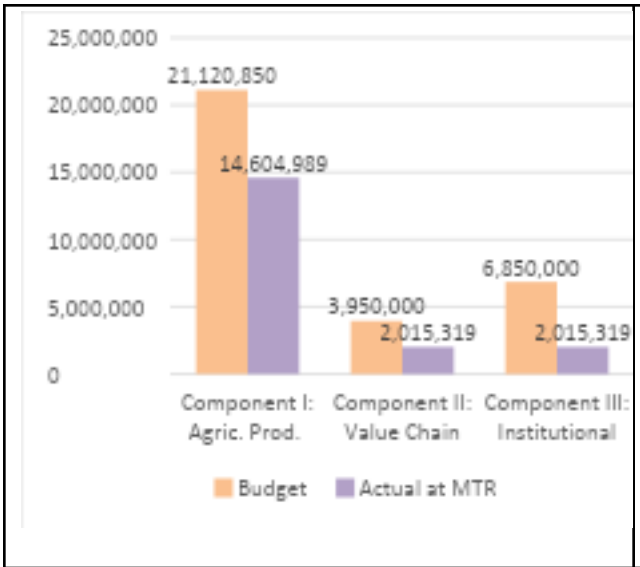

Figure 9a: APMEP Budgeted Versus Disbursed Amounts (USD Million)

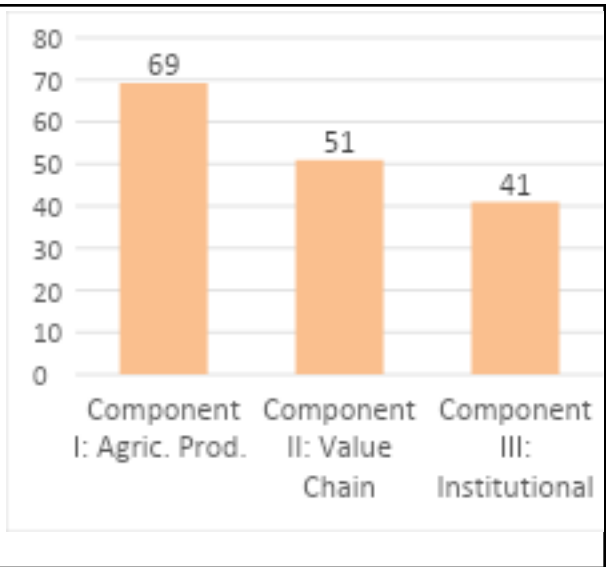

Figure 9b: % APMEP Amounts Disbursed by Component at Mid-Term Evaluation

With regards to intra-component performance, Crop Diversification and Intensification in Component I recorded the highest disbursement rate at 127% (which was also the highest across all APMEP sub-programmes), followed by Livestock at 109%. It was not immediately clear why these two sub-components spent above what was budgeted for. On the other hand, monitoring and evaluation (M&E) sub-component had the least disbursement at 22% across all the APMEP sub-components (see **Table 8** for other details). Ideally, M&E should have had the

[9] Suffice to mention that the data collection tool did not specify the names of the beans that were preferred.

highest disbursement rate, given its critical role of tracking the implementation performance of the other sub-programmes to ensure that all is going on according to schedule.

Table 8: Progress by Component and Sub-component at Mid Term Review

Component	Sub-component Description	Main progress to-date	Sub-component Funding	
			Budgeted (Million)	Disbursement to-date (USD million) and %[10]
Agriculture Production & Productivity ***UA 14.53 million (USD 22.02 million) (63.2%)***	***Irrigation Development:*** Develop 10 small-scale irrigation schemes (**Category 1**), covering about 2,032 ha with 4,115 rural farmers including scheme management entities and 56 community-level mini-scale irrigation schemes (**Category 2**, less that 20ha each) covering 895ha benefiting 8,400 farmers. Aquaculture activities: install 280 fish pens and 340 fish cages benefitting 16,000 people. Implement Environmental and Social Management Plan (ESMP) and watershed management activities.	• 3,122 hectares of land have been leveled against a 2019 target of 3337 (nearly 93%). • Irrigation schemes are not yet operational • Farmers have been mobilized and trained; • Water Users Associations have been formed • Staff have been trained • 320,000 fingerlings have been given out to farmers in Rufunsa, Chitambo and Serenje (2018), and 30,000 fingerlings were given out to farmers in Chitambo (2017)	• USD 19.23 (UA 12.69)	• USD 9.5 (58.70%)
	Crop Diversification and Intensification: Carry out conservation agriculture (4,300 ha, 12,000 smallholder farmers). Promote crop diversification (5,300 ha, 16,000 farmers) through - seed multiplication (13,000 packets). Promote farm mechanisation on 12,800ha (benefiting 17,000 farmers). Promote crop intensification on 6,700ha, (benefitting 15,800 farmers) using e-voucher system.	• 12,151 Ha under crop diversification (target of 32,730 Ha - from a 2013 baseline of 25,430 hectares). • Tractors and equipment provided to groups • Distribution of seed for 2 years through e-voucher; • Light ox-drawn implements procured and distributed • Farmers supported with e-voucher through MoA headquarters	• USD 1.44 (UA 0.95)	• USD 1.83 (127.22%)
	Livestock Development: Carry out livestock (goats/sheep) pass-on scheme for 180 women groups (3,600 women) and 30 youth groups (600 youths). Recruit NGO for livestock pass-on scheme. Support poultry (village/local chickens) management for 3,000 women and 200 youth poultry keepers. Provide thermal stable Newcastle vaccine and conduct vaccination campaign. Promote use of Community Animal Health Workers and Community Livestock Assistants through training and start-up drug boxes.	• 80 pass-on groups formed (71 women and 9 youth), • 65 poultry keeping groups formed • Heifer International has been engaged as the NGO to promote pass-on • 2 livestock service centres has been constructed	• USD 1.35 (UA 0.89)	• USD 3.26 (89.27%)
	Overall Agriculture Production and Productivity Component Picture		• **USD 22.02**	• **USD 14.60 (69.19%)**

[10] These figures are still being compiled. Once completed, an appropriate analysis will be undertake which, among other things, is expected to show disbursement levels across different components and sub-components. This will contribute towards informing recommendations in terms of which components to focus on, going forward.us

Component	Sub-component Description	Main progress to-date	Sub-component Funding	
			Budgeted (Million)	Disbursement to-date (USD million) and %[10]
Value Chain Development and Market Linkages ***UA 3.96 (USD 6.00) (17.2%)***	***Agro-processing Infrastructure Development:*** Establish 2 small-scale maize and feed mills, and 2 small-scale cassava mills with management entities. Procure community-level value addition equipment (40 honey presses and 70 solar dryers for rural women and youth groups). Support 60 existing agro-dealers with matching grant	• Contractor to supply and install a cassava mill in Chitambo has been engaged • Community level value addition equipment has been procured and distribution is currently on-going • Groups were mobilized and trained • Sites for construction of Agribusiness (Agro-market) have been identified and the consultant to design and propose appropriate business and governance models is almost done with the assignment • The procurement process of engaging a consultant to develop the mobile phone based market information system is at a negotiation stage	• USD 2.20 (UA 1.45)	• USD 1.37 (62.30%)
	Market Linkages: Establish 6 small-scale agriculture service (agro-market) centres (ASC). Upgrade 12 roadside markets to directly benefit 680 people. Rehabilitate 50km rural feeder roads. Set-up agriculture market information system using mobile phones.	• Sites for construction of roadside markets have been identified • Groups have been formed • Feeder roads for rehabilitation have been identified	• USD 1.75 (UA 1.45)	• USD 0.64 (36.84%)
	Overall Value Chain Development and Market Linkages Component Picture		**• USD 3.95**	**• USD 2.02 (51.02%)**
Institutional Strengthening ***UA 4.52 (USD 6.85) (19.6%)***	***Nutrition Security and Capacity Building:*** Provide nutrition education and nutrition outreach to the participating communities. Train community nutrition/health workers (80% women). Provide 13,000 women and 2,000 men with orange fleshed sweet potato vines. Develop Nutrition Information and Monitoring System.	• Training undertaken leading to a clear appreciation of the nutrition value of some crops, e.g. orange maize. Communities have been using the knowledge acquired, e.g. preparing porridge for children from orange maize • Vitamin A fortified orange maize seed distributed to groups for 2 years (through pass-on) • Schools for feeding programme identified and provided with vegetable and orange maize seed • Women groups have been mobilized for the nutrition programme and given inputs for orange maize (for 2 seasons) and cooking utensils and measuring equipment • 2 child feeding centres have been established in each district and the surrounding communities supported with inputs for orange maize among others.	• USD 2.91 (UA 1.92)	• USD 0.95 (32.53%)

Component	Sub-component Description	Main progress to-date	Sub-component Funding	
			Budgeted (Million)	**Disbursement to-date (USD million) and %[10]**
		• Cooking utensils and anthropometric measuring equipment have been distributed to these centres. • Food stuffs such as legumes, caterpillars, cassava flour etc. have been distributed to the centres to support the feeding of malnourished children in the areas. • Community volunteers have been identified who are involved in identification of households with malnourished children and bicycles bought for them • In Chitambo, there are 180 children who have benefited from the feeding programme out of which 120 have been rehabilitated already and 60 are undergoing the process of rehabilitation.[11]		
	Project Management: Support in-house MAL GAFSP Project Technical Team (PTT). Project management including supervision.	• MAL GAFSP project team supported • Project Implementation Unit has been established and is fully operational • Supervision visits are taking place	• USD 2.00 (UA 1.32)	• USD 1.42 (71.09%)
	Monitoring and Evaluation: Conduct baseline survey. Gender assessment survey. Develop Project M&E system. Produce progress reports. Conduct a nutrition audit. Beneficiary impact assessment. Prepare annual work plans and budgets.	• Monitoring and Evaluation System developed and various stakeholders trained • Quarterly progress reports are being produced • Annual work plans and budgets are being prepared • Gender audit, a nutrition audit and Beneficiary impact assessment undertaken.	• USD 1.94 (UA 1.28)	• USD 0.44 (22.49%)
	Overall Institutional Strengthening Picture		**• USD 6.85 (UA 4.52)**	**• USD 2.80 (40.94%)**
	Total APMEP Overall Picture		**• USD 31.92**	**• USD 19.42 (60.85%)**

[11] Other districts are yet to submit their figures. Chitambo rehabilitates 60 children every two months (1 month for recruitment and another month for the actual rehabilitation).

The overall implementation performance was negatively affected by quality at entry issues where there was neither an inception phase nor a feasibility study. In this regard, all the preparatory activities (including infrastructure designs and procurements) were all undertaken after the project had started being implemented. This is the major factor that has resulted in the relatively low implementation performance.

The Mid-Term Review recommends that sub-components to be focused on by the project in the remaining period of its life should be informed by a number of criteria including the following which are deemed to be among the key ones:

(i) ***Potential impact on increasing smallholder productivity and production (30 points):*** Given that the main focus of APMEP is to increase the productivity (and consequently production) of smallholders, it should follow that those sub-components with high potential of contributing to smallholder increased productivity and production levels should be given preference in the remaining project life. Marketing comes after production has taken place. If there is no increased production, there will be no surplus for sale;

(ii) ***The proportion of the total budget allocated to the sub-component (15 points):*** The higher the proportion, the more funds will have been spent at Mid-Term Evaluation and the reverse is true. In a case where relatively huge amounts of money have already been spent (in absolute terms) on a given sub-component, it would be costly and unreasonable to drop such a sub-component in the remaining project life;

(iii) ***The proportion of the total budget allocation that has already been disbursed (20 points):*** If for instance a considerable proportion of the budget of a sub-component has already been disbursed and spent on sub-component activities, it would be unrealistic to drop such a sub-component for the same reasons given in (ii) above;

(iv) ***Level of preparatory activities that have already taken place to date (10 points):*** If for instance, at least 40% of the total budget has already been spent on preparatory activities such as training of stakeholders, land preparation, etc. it is recommended that the component/sub-component be continued in the remaining project life. However, the focus should be on those areas which have the greatest potential of maximizing benefits, determined by responsiveness of farmers and MoA staff; the relative scale of preparatory activities, among other things.

(v) ***The extent of actual progress (15 points):*** This relates to the actual progress on the ground which has taken place to date towards the realization of project outputs and outcomes. This goes beyond merely engaging in preparatory activities (as is the case in the above point). In this regard, those sub-components which have made the most progress are worthy giving preference;

(vi) ***The extent to which the sub-component is a "low lying fruit" (10 points):*** Such sub-components would produce reasonable results in the relatively short period remaining before the project phases out, thereby providing the required retains to investment.

(vii) ***Number of beneficiaries already reached (10 points):*** by each respective sub-component. The greater the number of beneficiaries, the better the chances such a sub-component would have in terms of being focused on in the remaining project life, and;

(viii) ***Likelihood of Government being the main financier (25 points):*** This is concerned with government being the main source of funding of a sub-component. In other words, where a sub-component has the potential to mobilize funds from other sources other than government, it would not be a priority for funding in the remaining project life. APMEP funds are under the custodian of Government and hence it makes better sense for government to focus its funding on activities which other financiers would not easily finance for a number of reasons, including: relatively high costs, and; long gestation period.

The proposed list of the recommended sub-components to be focused on in the remaining project life has been arrived at through a carefully thought through process which has included the following steps:

(i) Each of the above eight (8) criteria has been given its own score depending on its perceived significance;
(ii) Each of the sub-components has been assessed against all the above 8 criteria, assigning a score as appropriate;
(iii) As part of the weighting process, the total sub-component scores from the 8 criteria have been converted into percentage values, and;
(iv) The sub-components with the highest percentages have been proposed for focusing on in the remaining project life (threshold of at least 40%).

Table 9 presents results of the scoring based on the above 8 criteria. It needs to be noted that Project Management and Monitoring and Evaluation sub-components are a necessity and hence do not depend on the level of scoring obtained. Thus these two sub-components must continue given their critical nature in project implementation performance. Apart from Project Management and Monitoring and Evaluation, there are six (6) sub-components which should be decided on in terms of their continuity in the remaining project life.

The Mid-Term Review Team recommends that three (3) sub-components be continued in the remaining project life that have scored above 40% (proposed to be the cut-off point), namely:

(i) Irrigation Development;
(ii) Livestock Development, and;
(iii) Crop Diversification and Intensification.

Table 9: Sub-component Scoring based on the 8 Proposed Criteria

Sub-component	Score	%
Irrigation Development	102	76
Project Management	83	61
Monitoring and Evaluation	77	57

Livestock Development	70	52
Crop Diversification and Intensification	61	45
Agro processing Infrastructure Development	40	30
Nutrition Security and Capacity Building	39	29
Market Linkages	35	26

Further justification (apart from what is implied by the 8 criteria) for focusing on irrigation, livestock and crop diversification in the remaining project life are presented below:

- ***Irrigation:*** One of the greatest challenges to increased smallholder productivity and production is over dependence on rain-fed agriculture. With the increasing frequency of drought conditions arising from climate change, small scale farmers' productivity levels have particularly been negatively affected. Irrigation has the greatest potential to not only stabilize and increase smallholder productivity levels, but to also stabilize their household food and income security. Unfortunately, irrigation requires heavy capital investment which ordinarily government is better placed to deal with.

- ***Livestock:*** Under the prevailing challenging climatic conditions that are increasingly making it difficult to support rain-fed agriculture, livestock production (particularly small ruminants) offers stability to household income security. Small ruminants (goats) have sufficient resilience to survive harsh and dry conditions. In most rural communities, small ruminants are perceived as a store of value thus, they are quickly converted into cash (through sale) to meet whatever need that might arise. Fish farming has huge potential to contribute towards household food, nutrition and income security.

- ***Crop diversification:*** Crop diversification included the promotion of orange maize through the Farmer Inputs Support Programme (FISP) e-voucher intervention. Orange maize has been specifically bred for high nutritional value. This has been particularly found useful among children. Qualitative research findings showed that rural households have appreciated the value of orange maize in boosting nutrition in children and have been keen in feeding children with this. This would go a long way in contributing towards dealing with the country's high levels of nutrition among under-five children which still range between 40% and 45%, a figure that is unacceptably too high.

6.3 Nutrition Security

Malnutrition remains a serious concern in Zambia, with 40 percent of the children under five years of age affected by chronic undernutrition (stunting), and 6 percent of the children under five years of age suffering from acute malnutrition (wasting) (ZDHS 2014). The Global Hunger Index (GHI) identifies the food situation in Zambia as alarming (Spring, 2017).

This section presents the following elements which are discussed in succession:

(i) Food prevailing and consumption pattern
(ii) Malnutrition prevalence among under five children
(iii) Dietary diversification impact of various project activities

(iv) General months of household food scarcity
(v) Factors which contribute to prevailing food consumption and dietary diversity
(vi) Recommendations on formulation of dietary guidelines and interventions

6.3.1 Food Prevailing and Consumption Pattern

Food is a basic human necessity to survive, sustain and the major source of nutrients needed for human existence. Food consumption patterns can be defined as the recognizable ways of eating foods. The food consumption pattern was ascertained using the 24 hour recall methodology. It does not provide an indication of the habitual diet but does provide an assessment of the diet at population level and therefore useful to monitor programme progress of target interventions. The food consumption patterns were not disaggregated by sex and age. However, it is expected that food consumption patterns were homogeneous within each district depending on food availability and culture. The highly consumed food groups were maize, ranging from 73% to 97%. Topping the list was Southern Province starting with Gwembe and Sinazongwe at 97% and 93% against Zimba the control district at 94%. The next in descending order was Lusaka Province with Chongwe district at 91% and Rufunsa at 84% while Chilanga the control district was at 90%. Central province was the least with Serenje at 84% and Chitambo at 73% while the control district Ngabwe was at 86%. This pattern of food consumption reflects the fact that maize forms the staple basis of food nationally in both target and control districts.

The next highly consumed foods were vegetables across all the districts. These constituted rape with the control districts of Zimba and Ngabwe scoring highly at 51% and 16% respectively while the target districts were not as impressive. The next highly eaten vegetable was pumpkin leaves where out of all the 6 target districts the proportion that consumed the vegetable was highest in Gwembe at 23%. High protein foods were not very popular. The list constituted of beans which was popular in Chitambo at 35% followed by kapenta and groundnuts at the rate of 15% in Chongwe. Groundnuts were relatively consumed on a higher scale, perhaps because they are usually used as a condiment in relishes such as vegetables. Interestingly out of all the 6 target districts, fish was most popular in Gwembe (34%) and Sinazongwe (31%). Out of the 3 control districts, fish was consumed the most in Ngabwe (58%).

Snacking is an effective way to fit extra nutrients into the diet. The list of snacks established were relatively healthy including fruits comprised of pawpaw, guava, oranges, avocado, bananas, water melons and mango. The energy dense category included fritters, bread/buns/ scones. The list also included foods such as mphonda (gourd), pumpkin and carrots. Incidentally, milk and milk products featured on the snacks list in form of fresh milk and sour milk (mabisi).

With regard to the practice of eating snacks; nearly all the districts recorded unsatisfactory results. Of the target districts, Sinazongwe scored the highest for none consumption of snacks at 59%, followed by Gwembe at 48%. Serenje stood at 45% while Rufunsa was at 44%. Out of the control districts, Chilanga scored highest at 44%. From the established list of foods eaten as

snacks Munkoyo scored the highest in all the districts, with Chongwe scoring the highest among target districts at 22%. This was followed by the other category and pumpkins with Rufunsa scoring the highest among target districts at 21 while Ngabwe was the highest among control districts at 28%. This is not surprising as data was collected during the rainy season when pumpkins are in abundance across the country (see **Statistical Annex** for details).

6.3.2 Malnutrition Prevalence among Under Five Children

An assessment of the malnutrition prevalence among under five children was undertaken in both target and control populations (see **Appendix 2** for the approach/methodology used). Data was put into categories of age groupings to allow identification of population groups most at risk or with special problems that would otherwise be masked by pooling all the data. The age classes were centered in months representing full years: 0 months (0 – 5), 6 months (6 – 11), 12 months (12 - 23) 12 months (24 - 35) 12months (36 - 47) and 13 months (48 – 60). Note that many ages were misreported and age biasing was towards full years (i.e. child considered to be 1 year but really 10 months). Making age classes around full years was meant to evenly distribute peaks of distribution usually seen around these values. Control districts were represented by Chilanga in Lusaka province, Ngabwe in central province and Zimba in Southern Province.

Underweight (weight –for-age)

Weight-for-age is a composite index representing height-for-age and weight-for-height; taking into account both chronic and acute undernutrition. Children whose weight-for-age index was below minus two standard deviations (-2 SD) from the reference population median were classified as underweight. Children whose weight-for-age was below minus three standard deviations (-3 SD) from the reference median were considered severely underweight (ZDHS 2014). Results for underweight are presented in **Table 8**.

Table 8: Weight-for-age (underweight) sample population and control group distribution by province and respective districts, May 2018

Province	District	Sample population			Control		
		N	<-3 (severe) Percent	<-2 (moderate) Percent	N	<-3 (severe) Percent	<-2 (moderate) Percent
Lusaka	Chongwe	42	7.1	14.3	34	11.8	14.7
	Rufunsa	66	15.2	16.7			
Central	Chitambo	113	0.9	5.3	92	4.3	14.1
	Serenje	104	2.9	7.7			
Southern	Gwembe	78	7.7	17.9	192	4.2	11.5
	Sinazongwe	168	5.4	11.3			

There were high levels of overall underweight malnutrition in Gwembe standing at 18% of <-2 Z scores, of all the target districts, much higher by a margin of 5% over and above the levels in Zimba as a control district at 12%. In the same vein severe underweight in Gwembe stood at

8% while that in Zimba was 4% the control district. The second in the hierarchy was Rufunsa at 17% overall underweight malnutrition and 15% severe underweight respectively. The third in descending order was Chongwe district standing at 14.3% for overall underweight malnutrition.

In respect of severe underweight malnutrition, Rufunsa scored the highest of all the target districts at 15% followed by Gwembe at 8% and Chongwe at 7% respectively. Note that both overall and severe underweight malnutrition was high for Rufunsa, above the national figures of 15% moderate and 3% severe respectively, implying that this district is much more vulnerable. However, underweight malnutrition being a composite indicator is not sensitive enough to conclude intervention impact assessment.

With regard to control districts in respect of overall underweight malnutrition Chilanga topped the list at 15% followed by Ngabwe at 14% and Zimba at 12%. The remaining districts all had severe underweight malnutrition below 5%.

Ngabwe as control district for central province performed worst for overall underweight malnutrition at 14% in comparison with both Chitambo at 5.3% and Serenje at 7%. This is a positive finding signifying that the interventions in place are beginning to produce positive outcomes. However, Rufunsa performed worse off at 18% than Chilanga as control district at 15%. In the same light Gwembe performed worse off at 18% compared to Zimba at 12%. At this point, suffice to note that, much as weight-for-age index is not a sensitive indicator and therefore not particularly useful for meaningful interpretation for intervention formulation, it is an index that is particularly used during maternal and child health (MCH) monthly visits and therefore the most familiar way of assessing nutrition evolution of a child over time.

Given the small population sample in the various age categories, it is not helpful to derive age categories that were most at risk of underweight malnutrition. It is also not very helpful to generate graphs to show pictorial representations.

Wasting (weight-for-height)

The weight-for-height index measures body mass in relation to body height or length and describes current nutritional status. Children with Z-scores below minus two standard deviations (-2 SD) from the reference population median are considered thin (wasted) or acutely malnourished. Wasting represents the failure to receive adequate nutrition in the short time period immediately preceding the survey and may be the result of inadequate food intake or a recent episode of illness causing loss of weight and the onset of malnutrition. Children with a weight-for-height index below minus three standard deviations (-3 SD) from the reference median are considered severely wasted. The weight-for-height index also provides data on overweight and obesity. Children more than two standard deviations (+2 SD) above the weight-for-height median are considered overweight or obese (ZDHS 2014).

The Tables that follow (**Table 9** and **Table 10**) present classification of malnutrition based on the World Health Organization (WHO) standards and results on wasting. Ordinarily, the analysis of these values should have been by age group of children and by area of district in order to facilitate more focused targeting of nutrition interventions. However, this level of detail was not

collected. Nonetheless, it needs to be born in mind that the 6 – 23 months is the most vulnerable period when malnutrition starts for various reasons. It is important at this stage of a child's life that they begin to receive appropriate diets using the FATVAH concept. This takes into account the frequency, texture/consistency, amount or quantity, variety, and hygiene. Complimentary food should be timely and given at the appropriate frequency as per guidelines; consistency and safe using the variety of foods to cover the growing child's nutritional needs while maintaining breastfeeding up to the age of 2 years or beyond. Note also that food should be prepared and given in a safe manner, and taking measures to minimize the risk of contamination. The aspect of responsive feeding should be taken to be of prime concern while obeying the principles of psychosocial care.

Table 9: Classification of malnutrition based on the prevalence of wasting Z-score for children under 5 years of age based on WHO standards

Severity of malnutrition	WHO rating of prevalence for wasting (%< median –2 SD)
Acceptable	<5
Poor	5 – 9
Serious	10 – 14
Critical	>15

Table 10: Weight-for-height (wasting) of the sample population and control groups by province and respective districts, May 2018

Province	District	Sample population			Control		
		N	<-3 (severe) Percent	<-2 (moderate) Percent	n	<-3 (severe) Percent	<-2 (moderate) Percent
Lusaka	Chongwe	44	0.0	4.5	31	3.2	9.7
	Rufunsa	66	3.0	7.6			
Central	Chitambo	112	0.0	1.8	84	0.0	2.4
	Serenje	108	3.7	5.6			
Southern	Gwembe	74	4.1	5.4	187	0.5	3.2
	Sinazongwe	163	2.5	6.7			

Performance of the wasting index was relatively comparable. Chilanga as control district for Lusaka Province was worst at 10%, falling in the serious category. At this rate it is expected that Chilanga experiences high mortality rates for the children in this age category in comparison to the other districts.

Given the WHO categorization of wasting malnutrition, Chilanga performed the worst out of the control districts in the category of overall wasting at 10 %.In terms of the target districts, Rufunsa was the worst at 8%, followed by Sinazongwe at 7% and lastly Gwembe at 5% in descending order. With regard to severe wasting, all the target and control districts performed below the 5% cut-off point of acceptability. This is because at any given point in time, it is expected that children would be suffering from all manner of illness in addition to poor feeding practices. Note that wasting malnutrition cannot be used as impact indicator.

Comparing the weight-for-height (wasting) index with weight-for-age (underweight) and height-for-age (stunting), clearly confirms its sensitivity. Given the deficit, weight-for-height (wasting) Z-score is of greater physiological significance than a similar deficit in weight-for-age (underweight) and height-for-age (stunting) indices. For instance a population of whom 10% fall below <-2 Z score weight-for-height has serious acute malnutrition and its attendant implications but if 10% of the sampled population fall below –2 Z score of weight-for-age (underweight) or height-for-age (stunting) as were the cases in the districts, the associated risks are lower.

Stunting (weight-for-age)

The height-for-age index is an indicator of linear growth retardation and cumulative growth deficits in children. Children whose height-for-age Z-score is below minus two standard deviations (-2 SD) from the median of the WHO reference population are considered short for their age (stunted), or chronically malnourished. Children who are below minus three standard deviations (-3 SD) from the reference median are considered severely stunted. Stunting reflects failure to receive adequate nutrition over a long period of time and can also be affected by recurrent and chronic illness. Height-for-age, therefore, represents the long-term effects of undernutrition in a population and is not sensitive to recent, short-term changes in dietary intake (ZDHS 2014). **Table 11** presents stunting results.

Table 11: Height-for-age (stunting) sample population and control group by province and respective districts, May 2018

Province	District	Sample population			Control		
		N	<-3 (severe)	<-2 (moderate)	n	<-3 (severe)	<-2 (moderate)
Lusaka	Chongwe	40	10.0	22.5	32	6.3	34.4
	Rufunsa	64	20.3	37.5			
Central	Chitambo	111	18.0	42.3	87	23.0	40.2
	Serenje	105	12.4	29.5			
Southern	Gwembe	76	13.2	26.3	191	6.3	23.0
	Sinazongwe	166	9.6	29.5			

Prevalence of overall stunting malnutrition (Height-for-age Z scores) for the children was highest in Chitambo district of Central Province out of all the target districts at 42.3% while severe stunting rate stood at 18% in the same district. Ngabwe the control district was at 40.2% overall stunting and 23% severe stunting respectively. At the rate of 40.2% overall rate stunting in Ngabwe compares favorably with the national figures of 40% according to ZDHS of 2014 signifying a problem of chronic food insecurity in these two (2) districts. Of the target districts, food insecurity vulnerability was followed by Rufunsa at 37.5%, Serenje and Sinazongwe at 29.5% respectively. It is interesting to note that Chitambo performed the worst with regard to overall stunting at 42.3% in comparison to national figures at 40% interpreted as being chronically food security insecure (see **Table 11** for details). However, much as stunting is not a very sensitive indicator for high mortality but scores lowly at intelligence because brain development is much affected negatively, it is a sensitive indicator for vulnerability in the long term and therefore will serve well as an impact indicator because it reflects past nutritional status (chronic malnutrition) of a child rather than the current nutritional status.

With regard to vulnerability to stunting by age group and district, all the age groups were affected negatively but to varying extents. Out of the target districts, the worst performing was Chitambo of the 12 – 23 months, at 57% overall stunting. This was followed by Chongwe at 50% for the 36 – 47 months age group and 12 – 23 months and 24 – 35 months at the same rate in Rufunsa. Of closer interest was the 0 – 5 months age group in Gwembe at 50%; a factor that reflects maternal malnutrition. In Serenje, the worst negatively affected was the 24 – 35 months age group at 48%. In Sinazongwe, the most affected was the 12 – 23 months age group at 39% followed by the 48 – 60 age group at 34%. From the control districts, Ngabwe performed the worst at 59% followed by Chilanga at 57% of the 24 – 35 age group.

Generally, the associated risks at these levels of stunting and underweight malnutrition are not of immediate significance in the short term but serve to point out to the fact that there is dire need to improve infant and young child feeding practices as a long term measure.

6.3.3 Dietary Diversification Impact of Various Project Activities

Dietary diversity is the sum of the number of different food groups consumed over a given reference period; used as a proxy for household food security. Dietary diversity (DD) is an important dimension of diet quality; consistently associated with micronutrient density among infants and micronutrient adequacy among women.

Diversity in diet is an important outcome in and of itself. A more diversified diet is associated with a number of improved nutrition outcomes including reduced childhood malnutrition. The twelve food group system proposed by the Food Agricultural Organisation (2010) for household dietary diversity was used. This constituted cereals, white tubers and roots, vegetables, fruits, meats, eggs, fish, legumes, nuts and seeds, milk and milk products, oils and fats, sweets and lastly spices, condiments and beverages. The three commonly consumed food groups comprised staple, vegetable and legume groups. At less than 50% the dietary diversity was significantly unsatisfactory. From the findings, all the districts consumed foods from the various food groups but to varying degrees. The staple group consisted of maize, sorghum, finger millet. Of this food group, maize represented the largest component (see **Statistical Annex**).

The second most consumed food group comprised vegetables. The vegetable food groups comprised sweet potato leaves, tomato, egg plants, cabbage, okra (ladies fingers), impwa (eggplant), bean and pigeon pea leaves, lumanda and rape. This group was dominated by rape followed by pumpkin leaves. There was significant consumption of tomato and onion but in practice these are not consumed as a food but used to a large extent as a condiment in other relishes so their contribution to food security is relatively insignificant. From the legume group, beans were consumed in fairly considerable proportions, with Chitambo scoring the highest at 35% out of the target districts, followed by Serenje while Chilanga scored highest out of the control districts at 35%.

Consumption of animal source foods and fish was not common across all the districts. Though no reasons were given for this low consumption of animal source foods, a wide spread practice in Zambia is that livestock are considered as items of wealth security to fall back on in times of dire scarcity for income generation. This invariably calls for concerted nutrition education to promote the consumption of such resource. Of the target districts, Gwembe and Sinazongwe reported higher consumption of fish at 34% and 31% respectively while Chongwe scored better at 14% for kapenta. A lower proportion consumed chicken and meat. With regard to chicken, Chongwe reported consumption of chicken at 14% while Chilanga the control district was at 11% (see **Statistical Annex).** None of the districts specifically reported consumption of milk and milk products, eggs or beverages. Perhaps these were constituted in the other category. Admittedly, Zambian diets especially in rural areas are monotonous and lacking the diversity required for good nutrition.

6.3.4 General Months of Household Food Scarcity

The average number of months of food scarcity at baseline across all the 6 target districts was 5 (conversely, 7 months of food availability). The target for 2022 was to bring the food scarcity months down to 3 (from 5 at baseline). At MTE, the food scarcity months were 5.07 (see **Table 7**), an increase from 3 months or from 4.5 months (based on the control sample). This worsening situation of food security in 2017 agrees with the general reduction in the harvested food in the same year on account of partial drought conditions. Across a vast area of the country, there was a serious dry spell for the entire month of January 2017.

An analysis was undertaken to establish the number of months food lasted by age group (19-35 years and 36 years and above) as well as by gender of household head, see **Tables 12** and **13** and **Statistical Annex** for details. Female headed households had a slightly longer period food lasted after harvest compared to their male counterparts (see **Table 12**) in the target population. In terms of the analysis of food the period food lasted by age group after harvest, the older households (36 years and above) had food a slightly longer period compared to the younger heads of households for both target and control populations (see **Table 13**)

Table 12: Months Food Lasted by Gender of Household Head

Household Head		Control		Participant	
		Months food lasted in 2013	Months food lasted in 2017	Months food lasted in 2013	Months food lasted in 2017
Total	Male	7,73	7,49	7,00	6,85
	Female	6,92	6,95	7,04	7,08
	Total	7,50	7,34	7,01	6,93

Table 13: Months Food Lasted by Age Category

Age Group		Control		Participant	
		Months food lasted in 2013	Months food lasted in 2017	Months food lasted in 2013	Months food lasted in 2017
Total	19-35 Yrs	7,48	6,91	6,56	6,28
	36+	7,50	7,48	7,10	7,07
	Total	7,50	7,34	7,01	6,93

6.3.5 Factors which Contribute to Prevailing Food Consumption and Dietary Diversity

As already alluded to in Sections **6.3.4** and **6.3.3** unpredictable weather patterns negatively impact food production levels and consequently consumption. By implication, dietary diversity is also affected by the type of food available. Other factors that contribute to prevailing food consumption and dietary diversity are late delivery of farming inputs and inadequate seed or its absence altogether. Extension services also contribute to prevailing food consumption and dietary diversity. Dietary diversity is also affected by the low access to other food groups i.e. livestock and fish and their products. Given that the implementation of the APMEP supported activities is yet to gather momentum on the ground, it was too early to assess the extent to which dietary diversity is supported by the various project components in an integrated approach. Notwithstanding the general improvement in the availability of Camp Extension Officers (CEO) in most agricultural camps (and in some cases all camps), their effective delivery of extension services remains a challenge due to a number of factors including; inadequate

operational funds and insufficient knowledge and skills in some improved farming technologies and farming practices.

6.3.6 Recommendations on Formulation of Dietary Guidelines and Interventions

Based on the understanding gained from the assessment, a recommendation to develop district specific food based dietary guidelines that are sound scientifically, well grounded in an understanding of each district's needs, and understanding of the knowledge, attitudes, and practices in the communities and households is proposed below. The approach recommended is premised on the need to create ownership among the various stakeholders.

Developing food based dietary guidelines (FBDG) is a comprehensive process, requiring a number of steps and skills spearheaded by nutritionists (project coordinators) from the ministries of health or agriculture in interdisciplinary teams. Through the process of engagement and consultation, the FBDG will be viewed as a creation of the public itself not by an "official group." To develop FBDG, the project should start with organising a workshop to address and harmonise the principles and procedures of developing FBDG involving national coordinators. It is worth noting that the country has already begun the process of formulating dietary guidelines (FBDG) with technical support from FAO and spearheaded by the Ministry of Agriculture, food and nutrition section through a consultant who has been engaged, who will be reporting to and will be supervised by the already constituted task force.

Currently the team is conducting a situational analysis on the food and nutrition situation in the country. However, FAO is mainly providing technical support as per their mandate with limited resources thereby making it difficult to explore various methods of obtaining data on the nutrition situation. Thus, the limited resource envelop has resulted in the process being delayed. Since one of the focus areas of APMEP is nutrition, we would like to recommend that APMEP considers funding this existing initiative. This way, APMEP's coverage and impact will be far much greater as it will have a national orientation. The on-going process should, among other things, the include development of country-specific plans of action, such as listing the activities for each step outlined below:

Step 1: Planning Sensitization of Key stakeholders: Multi-sectoral planning committees

To ensure that the FBDG would have a holistic approach and support from all the interested institutions, multidisciplinary committees should be established that shall include health sciences, social sciences, and communications professionals and representatives of the health, education, agriculture public agencies, as well as universities and the private sector. In order to facilitate the process, a national task force should be set up with representatives drawn from the multi-sectoral committee.

Step 2: Characterization of target groups, situational analysis regarding risk factors and problems associated with diet

During this step the health and nutritional status of the population groups should be addressed, taking into consideration access to food, eating habits, and sociocultural characteristics. The target groups should constitute healthy segments of the population of given age and sex (for example, girls and boys over 2 years, older adults). Health statistics, nutrition surveys, food composition tables, qualitative food consumption studies, and food production and distribution statistics should be obtained from annual

reports from the ministries of health, agriculture, and education, as well as reports from the various national statistical institutes/units. Data from published and unpublished national and community-based surveys and studies may also be used. It should be noted that there are usually limitations in the amount and quality of data available to assessing the nutrition situation. Focus group discussions should be used to obtain information on dietary patterns for the different districts. The results should then be documented describing the situations in each district, highlighting the risk factors and problems associated with the diets of each population group.

Step 3: Setting Nutrition and Health Objectives
The follow up task should be to hold a multi-sectoral committee meeting where the analysis of the situation will be discussed in terms of the scope and impact of the problems, and the feasibility of solving the problems. The objectives of the FBDG should be set with the aims of preventing and reducing the priority risks and problems detected in step 2, as well as promoting healthful diets and lifestyles.

Step 4: Preparing Technical Guidelines
In this step nutritionists should convert the nutritional goals into the types and quantities of food that the population should eat to meet the nutrient recommendations. The food groups, the profile of nutrients from each group, and the size and number of portions that ensure appropriate food intake in terms of quantity and variety should be set. A technical document summarizing the nutritional goals, nutrient recommendations, and other suggestions for achieving the aims of the FBDG should be derived to be used by the public, health and nutrition professionals.

Step 5: Testing the Feasibility of the Recommendations
Following training with a social anthropologist, field tests (behavior trials) should be conducted to determine whether or not the target population was willing and able to fulfil the technical recommendations made in step 4. The populations' reactions to the recommendations should then be analyzed, and the appropriate language for messages and ways to motivate people to implement the recommendations should be identified.

Households selected from various parts of each district should participate in the behavioral trials. The heads of the households should be interviewed about their perceptions on the recommendations and then requested to try to follow any 1 recommendation for 1 week. At the end of the week, they should be interviewed again to obtain information about their views of the recommendation after attempting to follow it.

The household heads should be asked if they remembered and understood the recommendation; how the recommendation applied to food items that they ate; to describe their own food preparation methods and eating habits; and if they knew the ways that nutritionists group food items to assess their understanding of the concept of dietary variety. This crucial step requires a reconciliation of technical theory and feasibility from the standpoint of the target population. The results of the behavior trials and focus groups, in conjunction with the situational analyses will provide practical knowledge about dietary behavior and the nutrition situation in each District.

Step 6: Preparation of the FBDG
The FBDG recommendations will then be conveyed to the target population through messages and a pictorial food guide. The recommendations will be selected on the basis of 2 criteria: the objectives of the guidelines and their potential for implementation by the

target group, based on the results of step 5. Limiting the number of messages will be intended to facilitate the dissemination of information through the media. It must also be born in mind that the aim for creating the guides should also embrace the fact that they should be attractive and culturally meaningful to help people to be able to recall the food they should include in their diets. Efforts should also be included to make the guidelines pictorial for the purpose of serving as educational tools for informing consumers about variety, proportionality and moderation.

Step 7: Validation, Correction and Adjustment
If the FBDG developed are correct technically, but they are not understood, remembered, and applied by the people for whom they are intended, they will not fulfil their purpose. The developed FBDG should be field tested with representatives of the target population to determine whether or not the messages or pictures are understood, relevant, acceptable, and persuasive.

The testing should be conducted in 3 phases: the messages, messages alone, the pictorial graphic alone, and then the 2 together.

Focus group discussions: The use of qualitative research methods, specifically, focus group discussions, is common in the development of FBDG because this method encourages people to speak freely and to express their understanding and feelings. Focus group discussions should be carried out among women and men selected from different parts of each district to ensure that the messages are appropriate, assess whether they understand the messages and whether they agreed or did not agree with the message and why. The members could also be asked if they already practiced the recommendations and also share the benefits and barriers to following the recommendations. Corrections and adjustments should be made to messages and graphics based on the test results. An additional technical review should be made after this stage to ensure that the adaptation to popular language does not distort the technical content.

Step 8: Implementation
Once the FBDG has been prepared, the next stage will be to reproduce, disseminate, and implement activities in each district through the public and private sector, using a communication strategy developed as part of the project. An inter district workshop should be held to plan the early stages of the implementation and to train the district teams in communication strategies. The district coordinators and communication specialists should create sets of tips and messages to help people to remember and practice the recommendations.

After refining the messages and obtaining the approval of the multi-sectoral committees, the final FBDG for each district should be adopted formally by the government of the republic of Zambia through the Ministry of Agriculture.

The key factors to be considered in each district should be to:

(i) Follow a healthy eating pattern across the lifespan especially for children below the age of five years.
(ii) Focus on variety, nutrient density and amounts.
(iii) Limit calories from added sugars, saturated fats, and reduce sodium intake.

(iv) Shift to healthier food and beverage choices while considering cultural and personal preferences, and
(v) Support healthy eating patterns for all.

6.4 Gender Audit

6.4.1 Participation in APMEP Supported Activities

The performance of a number of KPIs was assessed, disaggregated by gender. It needs to be underscored that by its design, APMEP was designed to ultimately express itself into various activities at the community level. **Figure 8** presents results of an assessment of the proportion (percentage) of households engaged in APMEP supported activities (ASA) by gender and district in 2017 (aggregate picture). In 5 out of the 6 target districts, the proportion of female headed households engaged in ASAs was higher than that of their male counterparts. The largest gap between female and male headed households in relation to this particular variable was in Chongwe (nearly 28% for female compared to about 8% for male). This accounts for more than 3.4 times percentage of women who were involved in income generating activities compared to the proportion of their male counterparts.

These findings suggest that in percentage terms, there were greater proportions of female headed households who were involved in APMEP supported activities at MTE compared to their male counterparts. This is a positive development because it promotes household income, food and nutrition security through improved access to improved income levels. These are important APMEP objectives.

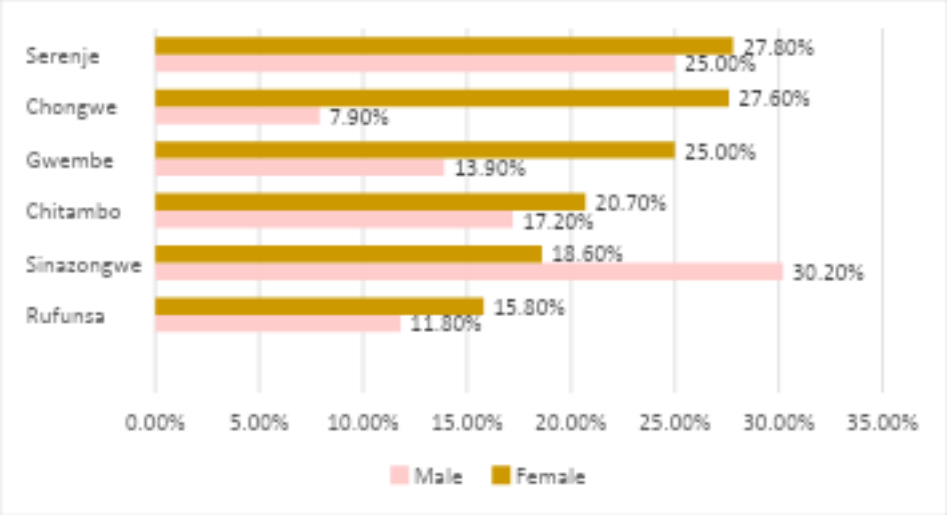

Figure 8: % h/holds engaged in APMEP Supported Activities by gender and district 2017