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Beneficiary Impact Assessment for The Agriculture Productivity and Market Enhancement Project

Final Report

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DISCLAIMERS

This report presents the independent perspectives of the Consultant. The author's views and opinions expressed in this publication are solely those of the author and do not necessarily mirror the views of the Global Agriculture & Food Security Program (GAFSP), African Development Bank Group (AfDB), Ministry of Agriculture (MoA) and/or Ministry of Fisheries and Livestock (MFL). In the event of verbatim quotations being included in this publication, it must be noted that the opinions and views expressed by interviewees are solely those of the interviewees and do not necessarily align with the beliefs of the authors, GAFSP, AfDB, MFL and/or MoA.

ACKNOWLEDGEMENTS

The Consultant received unmatched support from different stakeholders throughout the implementation of the Beneficiary Impact Assessment (BIA) for the Agriculture Productivity and Market Enhancement Project (APMEP). While it may not be possible and easy to list down all the players, special mention goes to some key ones.

The African Development Bank (AfDB) for providing valuable information regarding the project and extending full support in the assessment process through guidance on the BIA expectations. This support was instrumental in successfully carrying out the assessment.

The MoA and MFL officials at various levels played a pivotal role in ensuring seamless management and successful implementation of the evaluation. Their unwavering commitment and proficiency were instrumental in guaranteeing a fruitful outcome of the evaluation.

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LIST OF ABBREVIATIONS

AfDB	African Development Bank Group
APMEP	Agriculture Productivity and Market Enhancement Project
BIA	Beneficiary Impact Assessment
CA	Conservation Agriculture
CCM	Chitambo Cassava Milling
CEEC	Citizens Economic Empowerment Commission
CFCs	Child Feeding Centres
COMACO	Community Markets for Conservation
DCUs	District Cooperative Unions
FGDs	Focus Group Discussions
GAFSP	Global Agriculture Food and Security Program
GRZ	Government of the Republic of Zambia
IDC	Industrial Development Corporation
KIIs	Key Informant Interviews
KPIs	Key Performance Indicators
LSCs	Livestock Service Centers
MAL	Ministry of Agriculture and Livestock
MoA	Ministry of Agriculture
MFL	Ministry of Fisheries and Livestock
MTR	Mid-Term Review
OECD	Organization for Economic Cooperation and Development
PAR	Project Appraisal Report
PIU	Project Implementation Unit
SCCI	Seed Control & Certification Institute
SPSS	Statistical Package for Social Sciences
TAAT	Technologies for African Agriculture Transformation
ToRs	Terms of Reference
USD	United States Dollar
ZNFU	Zambia National Farmers Union
ZMW	Zambian Kwacha

EXECUTIVE SUMMARY

Will be included after receiving feedback from the APMEP team

1.0 INTRODUCTION

The APMEP's objectives are to contribute to economic growth and poverty reduction by enhancing food, income and nutrition security, among participating households. The Project's focus areas were the development of irrigation and aquaculture, the advancement of crop and livestock production and productivity, the promotion of Agro-processing and value addition, the establishment of market linkages, as well as the participation of men, women, and youth, to enhance household income, food security, and nutrition. The project estimated total number of direct beneficiaries was 75,000 including 33,750 (45%) women. Further, about 40,000 people were intended to indirectly benefit from the Project along the commodity value chain development lines. About 2,000 (2.7%) rural youths were targeted for employment by the Project through income-generating activities. APMEP projected to produce a minimum of 450 full-time skilled/semi-skilled jobs and 2,200 part-time unskilled jobs in production, processing, and marketing, which would benefit men, women, and youths.

The report presents an assessment of the impact of sub-components on beneficiaries, with a particular focus on women and youth participation. Additionally, the report assessed the effectiveness of job creation opportunities and income generation for beneficiaries, with a specific emphasis on women and youth. The impact of gender-based interventions on individual levels, as well as environmental and social safeguards and nutrition security, are presented in the report.

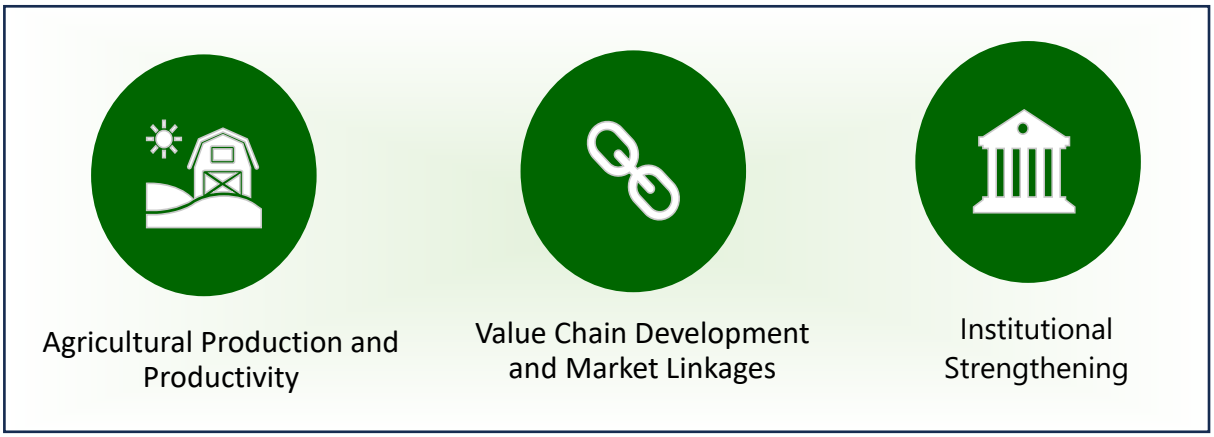
The report consists of 10 distinct sections, each serving a specific purpose. The introductory segment, Section 1, outlines the document's objectives and provides a clear understanding of the report's structure. Section 2 furnishes a comprehensive summary of the project, including a detailed description of the project and its survey objectives. Sections 3 and 4 elucidate the methodology employed by the Consultant and the demographic characteristics of beneficiaries, respectively. These sections offer the reader a detailed understanding of the research methodology and the characteristics of the beneficiaries of the project. Section 5 presents the findings based on the evaluation criteria. Section 6 highlights the crosscutting issues of gender, environment, social safeguards, nutrition security and sustainability relating to the project. Furthermore, Section 7 presents the challenges faced by both the project team and beneficiaries during the implementation, with Section 8 providing an in-depth analysis of the valuable lessons learnt throughout project implementation. The conclusion and recommendations are presented in Section 9.

2.0 PROJECT DESCRIPTION

2.1 Overall Project Description

The project comprised three components namely: Agricultural Production and Productivity; Value Chain Development and Market Linkages; and Institutional Strengthening.

Figure 1: Project components



Component 1: Agricultural Production and Productivity.

This component had three sub-components: namely irrigation development, crop diversification and intensification and livestock development. Under Sub-component 1.1, irrigation development, the Project intended to develop 10 small-scale irrigation schemes covering about 2,032 ha with 4,115 rural farmers, including scheme management entities and 56 community-level mini-scale irrigation schemes (less than 20 ha each) covering 895 ha benefiting 8,400 farmers. Also, under Aquaculture activities of this sub-component, the Project was to install 280 fish pens and 340 fish cages benefitting 16,000 people and will also implement Environmental and Social Management Plan (ESMP) and watershed management activities. In Sub-component 1.2, crop diversification and intensification, the Project would carry out conservation agriculture on 4,300 ha expected to benefit 12,000 smallholder farmers. It will also promote crop diversification on 5,300 ha of land for about 16,000 farmers through - seed multiplication (13,000 packets). The Project was expected to promote farm mechanisation on 12,800 ha to benefit 17,000 farmers. Promote crop intensification on 6,700 ha, benefitting 15,800 farmers using e-voucher system. Under Sub-component 1.3, livestock development, the Project was to 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.

Component 2: Value Chain Development and Market Linkages

The project had two sub-components namely Agro-processing infrastructure development and market linkages. Under Sub-component 2.1, Agro-processing infrastructure development, the Project would 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.

The Project intended to facilitate the installation of 4 processing plants through a matching grant (80/20) to District Cooperative Unions (DCUs) for industrial milling and processing of maize and Cassava. The proposed maize milling plants are to be sited in Serenje and Gwembe Districts and the cassava milling plant in Serenje District. Further, the project intended to support community-based Agro-dealers by enabling them to properly bring Agro-inputs and services to smallholder farmers in their local communities. This, in turn, was intended to increase small-scale farmers' access to agricultural inputs by creating retail outlets in rural areas. Under Sub-component 2.2, Market linkages, the Project would establish 6 small-scale agriculture service (agro-market) centres (ASC), upgrade 12 roadside markets to directly benefit 680 people rehabilitate 50km rural feeder roads, and set-up agriculture market information system using mobile phones.

The intention is for the Project to empower Zambia National Farmers Union (ZNFU) to set up Agro-Market Centers in Serenje, Kapiri-Mposhi, Sinazongwe, Gwembe, Mpika, and Masaiti districts as well as strengthening out grower and market linkages between farmers and existing processors for maize, soya beans, sorghum, and cassava (processors and millers). Furthermore, the project intended to design to rehabilitate rural feeder roads in each participating district (50 km per district), totalling 300 km, to connect smallholder farmers to markets and existing major road networks and identify 12 farmer-initiated roadside market centres and improve them for better trade. The Project will provide parking-bay along the road for motorists, shelter with appropriate stands and sanitation facilities. This will directly and indirectly benefit 9,000 and 20,000 farming households/traders respectively.

Component 3: Institutional Strengthening

This Component has two sub-components namely: Sub-component 3.1 Nutrition ecurity and capacity building which aims at training 100 district extension staff as trainers of trainers in all the targeted districts who are also supposed to train 150 front-line extension staff in various food and nutrition technologies. The frontline extension staff would further train 750 lead farmers, and each lead farmer is targeted to disseminate the technologies to 100 farmers, achieving a total of 75,000 households to be trained. There was a deliberate targeting of more than 50% of female-headed households. They also intended to provide nutrition education to the extension staff of the Ministry of Agriculture and Livestock (MAL), which has now separated into separate ministries namely MoA and MLF, and other relevant ministries like health and

education, through the use of existing farm institutes or farmer training centres facilities. Under Sub-component 3.2, Project management, the Project aimed at addressing the capacity gaps of existing staff in the MAL and other related ministries, including the Ministry of Education and Health. The Project would also support outsourcing extension services from Non-Governmental Organisations (NGOs) and private companies. Under Sub-component 3.3, Monitoring and Evaluation (M&E), Baseline survey will be conducted as well as Gender assessment survey. Project M&E system will be developed, Progress review meetings held, progress reports produced. Gender audit and Beneficiary Impact Assessment will be conducted. Prepare annual work plans and budgets. The intention was to enable the Project Management Staff, and key stakeholders to track project implementation using results-based logical framework indicators and targets. On the environmental and social management, the project intended to undertake all the required environmental assessments for sub-projects, implement the Environmental and Social Management Plan, and finance all environmental monitoring and mitigation measures.

Table 1: APMEP project summary

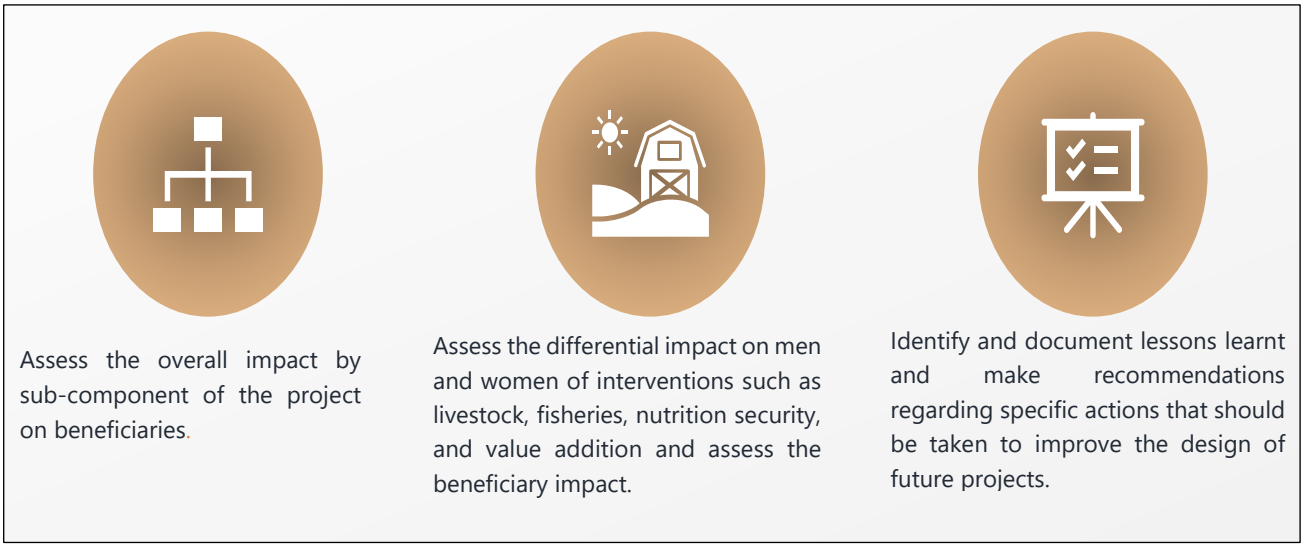
Approval Date	26 Mar 2014
Signature Date	10 Jun 2014
Planned Completion Date	30 Jun 2023
Funding	Global Agriculture and Food Security Program
Extending	Government of Zambia
Implementing	Ministry of Agriculture (MoA)
Commitment	U.A 23,056,975.62 USD 31,120,000.00

Source: https://projectsportal.afdb.org/dataportal/VProject/show/P-ZM-AA0-019

2.2 Objectives of the Evaluation

The main purpose of this assignment was to provide an independent analysis of the progress of the APMEP in reaching out to beneficiaries and assessing the impact the various interventions had on beneficiaries at the household, group, and individual levels. The goal of the evaluation was to examine the outreach of the sub-components to beneficiaries and determine the levels of participation by women and youth and highlight how these interventions have impacted beneficiaries and by gender. Other elements were to assess aspects of job creation opportunities and beneficiary income, especially among women and youths, the impact of gender-based interventions at household and individual levels, environmental and social safeguards, and nutrition security.

Figure 2: Evaluation objectives



The specific scope of work included the following:

1. Document evidence of project activities impact on household livelihoods, based on the condition of assets, household incomes, annual food availability, social amenities available, agro-processing activities, income generating activities, and input and output delivery services.

2. Assess project results and effects, in terms of development outcomes, based on the project's actual development impact on the primary stakeholder groups, relevant institutions and the communities.

3. Evaluate the progress in project implementation measured against planned outputs outlined in the Project Appraisal Report (PAR) and the assessment of the process involved in achieving those outputs and the project effects.

4. Evaluate the adequacy of the project design and sustainability of project implementation and assess the project activities, outputs, and outcomes.

5. Quantify the number of skilled and non-skilled jobs created through project interventions.

6. Assess involvement and roles played by men, women and youth in various project activities, leadership, and decision-making processes.

7. Assess the extent to which nutritional and food security has been achieved using the Food Insecurity Experience Scale (FIES) in the six (6) APMEP districts and in which project activities have been implemented.

8. Assess the overall impact of climate-smart interventions in the project.

9. Identify lessons learnt from the Project and review best practices that could be recommended for the future design of other projects.

10. Assess the trends in agriculture productivity in terms of average crop yields and the average livestock off-take per year for goats and poultry.

3.0 METHODOLOGY

3.1 Overview of Assessment Design

The Consultant adopted a mixed approach, collecting data using quantitative and qualitative methods. This included the presentation of data for impact-level indicators based on the Results-Based Logical Framework (Project Matrix) and the attribution of impact via interviews with beneficiaries. The data collection methods consisted of a Document review, Key Informant Interviews (KIIs), Community meetings, Beneficiary individual interviews, Questionnaires, Success stories and observations.

3.2 Survey Design

The Consultant adopted a cross-sectional design. This was preferred as it enabled empirical observations on the outcomes at a particular time and with low operational costs compared to the cost of undertaking tracer studies or other experimental designs.

3.3 Data Collection Methods

The data collection techniques included.

Documents	**The Consultant thoroughly reviewed all relevant documentation about the APMEP project. This provided context and insight into the project's concept and execution model.**
Key Informant Interviews (KIIs)	A purposive sampling strategy was used for qualitative data from KIIs. The primary instrument was the Key Informant Semi-Structured Questionnaire for informed project staff, stakeholders, and partners. The questionnaire was used to collect information on the APMEP Project's relevance, efficiency, effectiveness, sustainability, and impact. A total of 22 interviews were conducted.
Community Meeting**s**	The Consultant conducted community meetings to obtain community-level insights into issues related to the project as opposed to the individual checklist, which focused on issues at the household level. A total of 14 community meetings were conducted
Beneficiary Individual Interviews	To gain a comprehensive understanding of the project's individual-level impact, the Consultant carried out individual interviews with beneficiaries who attended the community meeting. The selection of respondents was based on a census, ensuring a fair and unbiased selection. A total of 240 interviews were conducted.
Success Stories	The Consultant compiled success stories from beneficiaries to aid interpretation of project results. In total, 3 stories were written.
Self-administered Evaluation Rating Checklist,	The Consultant employed a self-administered assessment checklist, which was provided to key informants.
Observations	The Consultant observed practices and other activities during field visits. This method aided the Consultant's understanding of the beneficiaries in the areas of investigation.

3.4 Data Analysis

Quantitative data: The Consultant utilized the Statistical Package for the Social Sciences (SPSS) and Excel software to conduct quantitative data analysis. This included both univariable and bivariable data analysis. During the univariable data analysis, the Consultant examined each variable in the dataset and analysed the mean, median, and mode of every continuous variable. To facilitate a more comprehensive analysis of the data and derive meaningful insights, the bivariable data analysis involved comparing the variables of interest against demographic characteristics, such as sex, age, and location.

Qualitative data: To analyse the ideas, expressions, experiences, and viewpoints shared during KIIs and community meetings, the transcripts and summary sheets were utilized as valuable sources of qualitative data. The Consultant reviewed the summary sheets to ensure that each accurately depicted the logical relationships and emerging patterns discussed and how they relate to the project intervention. This ensured that the data was both thorough and precise in its presentation.

3.5 Ethical Consideration

The assessment did not pose any significant risks to the respondents that would solicit a formal ethical clearance. However, the Consultant used sound research technics to further minimize any threats to the respondents because of participating in the assessment. Despite the evaluation not going through the full ethical clearance process, the Consultant ensured strict adherence to standard ethical guidelines and practice. The respondents were given full information concerning the objectives and their rights to refuse to participate or answer specific questions. All respondents consented before the interview or discussion. The Consultant also ensured that participants willingly took part in the interview. To ensure data security, each team member received training on research ethics and strict security procedures. Furthermore, the data analysis was undertaken in an aggregated format without reference to any respondent. In this manner, no one will determine the source of a quote, a viewpoint, or a data point.

3.6 BIA Limitations

The key limitation was that the individual beneficiary interviews did not have a representative sample of the project beneficiaries to aid a robust quantitative data analysis of the project impact. Qualitative information was used mostly to describe the changes observed in project sites. Therefore, the assessment only provided an indicative performance on the project indicators. This was due to budgetary restrictions and the assignment's set time frame. It should be noted that the estimation of specific PAR indicators depended on secondary data provided by APMEP staff.

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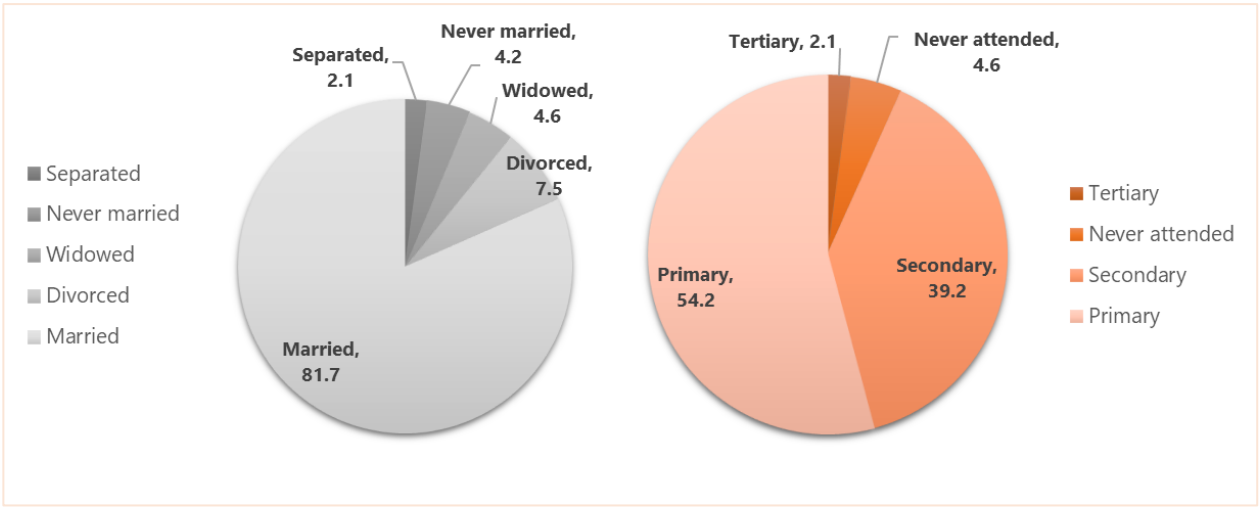
4.0 DEMOGRAPHIC CHARACTERISTICS

This section provides a comprehensive overview of the respondents' background characteristics and profiles. The information captured includes but not limited to, the respondent's sex, age, level of education, marital status, household size, and household income. The data presented here is multidimensional and will aid in understanding the respondent's perspectives.

Based on the interviews with the project beneficiaries during community meetings, the distribution by sex indicates that 57.9% were male, while 42.1% were female. In terms of age, the average was reported to be 46 years old with the minimum age being 18 years and the maximum age being 76 years. The findings further revealed that the respondents were mainly adults (79.6%) as compared to youths (20.4%). In this context, the term "youths" refers to individuals aged between 15 and 35 years old[1].

The analysis of marital status among the respondents showed that 81.7% of the respondents were married. The second most reported status was divorce at 7.5% followed by never married and widowed at 4.2% and 4.6% respectively while the separated status was the least commonly reported at 2.1%. In the realm of education, the respondents exhibited a distribution where 54.2% had attended up to the primary school level, while a significant 39.2% had accomplished secondary school education. The tertiary education level reported the lowest representation at 2.1%.

Figure 3: Respondent marital status vs education levels



In relation to household size, it was determined that the average number of people per household was 7.3, with a median of 7.0. The smallest household had only one member, while the largest household had 18 members. These findings provide insight into the demographic trends in these respondents.

Household income as a key indicator of the economic status of a household was determined. According to findings, the average household income in 2022 was ZMW 13,754.764 (USD

[1] 2015 National Youth Policy

812.36[2]), with a minimum of ZMW 100 (USD 5.90) and a maximum of ZMW 150,000.00 (USD 8,858.44). The average annual household income exhibits a significant increase from the baseline data, surpassing the project completion objective of USD 500 and demonstrating progress by reaching USD 812.36 in 2022. This information highlights a marked improvement compared to the baseline data.

When disaggregated by sex, male beneficiaries had a higher average household income of ZMW 17,705.57 (USD 1,045.59), compared to the female beneficiaries who reported an average household income of ZMW 8,187.73 (USD 483.53). This shows that there was a significant disparity in income between male and female beneficiaries. In terms of age, the adult population reported a higher average household income of ZMW 14,311.51 (USD 845.18) compared to the youth population of ZMW 11,745.65 (USD 693.64). This finding is consistent with the results of the 2015 Living Conditions Monitoring Survey Report which reported that on average, male-headed households earned more than female-headed households (K1,928 compared to K1,378, respectively).

In terms of household on-farm income-generating activities, the finding revealed that beneficiaries reported an average income of ZMW 11,950.32 (USD 705.72). Male beneficiaries reported a higher average income of ZMW 16,766.92 (USD 990.19) than their female counterparts whose average income was ZMW 5,508.13 (USD 325.29). This data also suggests a gender gap in on-farm income generation among the beneficiaries. See **Table 2** for details.

Table 2: Summary of socio-economic characteristics of sampled beneficiaries

Description	Male	Female	Youths	Adults	Overall
The average age among beneficiaries	48.2	43.7	28.6	50.8	46.3
Average annual household income (USD)	1,045.59	483.53	845.18	693.64	812.36
Average income generated from On-farm income-generating activities (USD)	990.19	325.29	545.71	752.10	705.72

[2] The calculation has been made based on the 2022 average exchange rate for the annual period. Source: Bank of Zambia Annual Report for 2022

5.0 KEY FINDINGS

5.1 Results by Evaluation Criteria

4.1.1 Project Relevance

This section outlines the extent to which the project objectives and design align with the needs, policies, and priorities of the beneficiaries[3], as well as responding to global, country, and partner/institutional requirements[4]. It also highlights the project's ability to adapt to changing circumstances while staying aligned with the beneficiaries' needs and expectations..

- Alignment with National Development Plans and Policies

The project's objectives were to assist the Government of Zambia in enhancing agricultural diversification, production, processing, and market connections. The primary focus was on the development of infrastructure and ensuring proper governance and accountability throughout the implementation process. Going by its goal and objectives, the project was aligned with various national policies and plans, including the National Development Plans (6th to 7th), National Agriculture Policy (NAP 2004-2015), National Agriculture Investment Plan (NAIP: 2014-2018), National Gender Policy (2000), Food and Nutrition Policy (2006), National Food and Nutrition Strategic Plan (2011-2015), and the First 1,000 Most Critical Days (2013-2015) at the time of its commencement. The promotion of agricultural production and productivity improvement targeting a range of areas, including crops, livestock, and aquaculture, was a key policy focus under every one of these highlighted documents. This project was designed to support the Government's efforts in achieving sustainable agricultural development and promoting food security in Zambia. Its objectives were carefully crafted to align with national policies and plans and promote agricultural productivity improvement in various areas..

From the National Agricultural Policy 2004-2015 to the Revised National Agricultural Policy 2012-2030, the relevance of the Project's objectives in meeting national and beneficiary priorities have not shifted, as it continues to be pertinent in:

- Promoting a sustainable increase in agricultural productivity of major crops with comparative advantage
- Continuously improving agricultural input and product markets to reduce marketing costs and increase profitability and competitiveness of agribusiness;
- Improving access to productive resources and services for small-scale farmers, especially women and young farmers.
- Continuously strengthening public and private sector institutional capabilities.

The project aligned with the 8th National Development Plan's (8NDP) aspiration to stimulate productivity and output in the agriculture domain by expanding the cultivated hectares,

[3] Beneficiaries is defined as, "the individuals, groups, or organisations, whether targeted or not, that benefit directly or indirectly, from the development intervention.

[4] See DAC Network on Development Evaluation (2018), OECD DAC Evaluation Criteria: Summary of Consultation Responses (November 2018). Available at: oe.cd/criteria

enriching productivity, and incorporating agricultural mechanization. With respect to aquaculture advancement, the policy persists in promoting investments that will enhance fingerling production and promote the implementation of fish breeding in line with the aquaculture development subcomponent's project goal. Additionally, this undertaking is in line with the 8NDP objective of heightening productivity and output in the agriculture sector.

Overall, the APMEP has remained in alignment with the Government of Zambia's development agenda as outlined in the National Vision 2030. This vision embodies Zambia's aspirations and commitment to becoming a prosperous middle-income country by the year 2030.

- Alignment with AfDB Country Strategy for Zambia

The design of the project was created to support the first pillar of the AfDB Country Strategy for Zambia (2011-2015), which aimed to promote economic diversification through infrastructure development and productive sectors. The project aimed to foster inclusive growth and promote the transition to green growth, while contributing to the development of infrastructure, agriculture, and food security. Alignment with Sustainable Development Goals

The realization of the Sustainable Development Goals (SDGs) serves as the fundamental solution for eliminating all forms of poverty worldwide. The project was aligned with the attainment of several SDGs, namely, Goal 1: No poverty; Goal 2: Zero Hunger; Goal 5: Gender Equality; Goal 8: Decent Work and Economic Growth; Goal 9: Industry, Innovation, and Infrastructure; Goal 10: Reducing Inequalities and SDG 12: Responsible Consumption and Production.

- Government Commitment to the Project

The Government recognized the significance of agriculture in bolstering the economy of Zambia, as evidenced by their unwavering commitment to the APMEP project. The Government provided institutional backing to the project through the creation of a Project Steering Committee (PSC) comprising senior government officials. The PSC was entrusted with the responsibility of ensuring the project's alignment with sector policies and strategies and its compliance with the Government's objective. Besides its efforts to foster agriculture, the Government has implemented several policies and strategies to stimulate agricultural growth in the country. The Government has also shown its commitment to APMEP by providing necessary counterpart funds as at and when due.

- Project harmonization with existing efforts and structures

From the inception of the APMEP project, its implementation operations were aligned with MoA and MLF's existing structures. Accordingly, the project made use of Subject Matter Specialists (SMS) appointed by the MoA and MLF Permanent Secretaries from (i) livestock, (ii) irrigation, (iii) crops, (iv) monitoring and evaluation, (v) fisheries, (vi) nutrition, (vii) gender, (viii) agribusiness, (ix) cooperatives, (x) accounting and procurement, and (xi) human resources. Furthermore, the project also leveraged existing structures at the district and community levels through the District Agriculture Coordinating Office (DACO).

At the community level, the project strategically leveraged existing community structures to choose cooperatives and schemes through a participatory selection process. This approach yielded several benefits, including heightened member ownership and accountability, greater community involvement and support, and more sustainable decision-making. Moreover, by involving local structures in the selection process, the project ensured that the chosen cooperatives aligned with the community's priorities and requirements. Overall, this inclusive approach fostered more robust ties between the project and the community, thus improving not just its relevance but also its effectiveness and sustainability.

Overall Sub-Component Rating

Based on the stakeholder assessment, it was revealed that the project development objective was deemed satisfactory. This suggests that throughout the implementation phase, the project's objectives were aligned with the Bank's CSP, applicable sector strategies, and country development strategies, and catered to the needs of the beneficiaries. Additionally, stakeholders rated the project design as satisfactory, indicating that the design consistently supported the achievement of the project's results from approval through implementation to closure.

5.1.2 Project Effectiveness

The term "effectiveness" refers to the degree to which an intervention can fulfil its objectives and produce desired outcomes, while also considering any disparities experienced among different groups. When something is considered effective, it means that it has accomplished its intended purpose. In essence, effectiveness is concerned with the tangible results or achievements that an intervention can produce. It raises fundamental questions such as whether the planned objectives were achieved, if the set targets were met, and other related aspects of the intervention. The report's presentation on effectiveness is delivered in strict adherence to the project's design. This approach ensures that the information is presented in a structured and organized manner, providing a clear understanding of the report's findings.

Component 1: Agriculture Production and Productivity

Sub-component 1.1 Irrigation Development

The primary aim of the project was to establish ten small-scale irrigation systems, covering a vast area of 3,337.0 ha, to improve irrigation infrastructure and management practices in the designated districts. However, the project design had to be modified due to fluctuations in costs. The actual cost of setting up a single small-scale irrigation system exceeded the budgeted cost significantly, resulting in the installation of a centre pivot at the Shikabeta Irrigation Scheme in the Rufusa district, covering an area of 136 ha. Operations at the scheme are awaiting the installation of power, which is scheduled to be completed by September 2023. Unfortunately, the other 9 schemes could not be completed due to the escalation of costs per scheme. While it was initially feasible to implement 3 schemes, procurement delays necessitated the reallocation of funds to other activities.

Aside from the increasing costs associated with each scheme, the non availability of project designs suited for small-scale irrigation systems and market structures was another crucial factor that led to the project's redesign. As a result, the project engaged a Consultant's services to develop the necessary designs, which was prolonged due to the procurement process. Additionally, the design process was exceptionally time-consuming as the Consultant had to create multiple designs for various schemes in the targeted districts.

Despite the Consultant's diligent efforts to create various designs, only one design, specifically the centre pivot design, was ultimately selected. One respondent highlighted the adjustments to the project design and narrated that "*the absence of engineering designs for this particular infrastructure development by the government resulted in a protracted process of conceptualizing the irrigation scheme and market structures. Upon completion of said designs, it was revealed that the financial resources were insufficient to execute all plans as intended, leading to the need for design modifications.*" Further, the adjustment leading to the selection of a centre pivot design was also cited by another respondent who narrated that *"the government had a firm stance on the preferred irrigation method and directed the Consultant to implement a centre pivot system. However, the subsequent design and cost assessment revealed that completing the 2300.0 ha of centre pivot installation would require over 60 million dollars, while the allocated irrigation budget was limited to approximately 10 million dollars.*

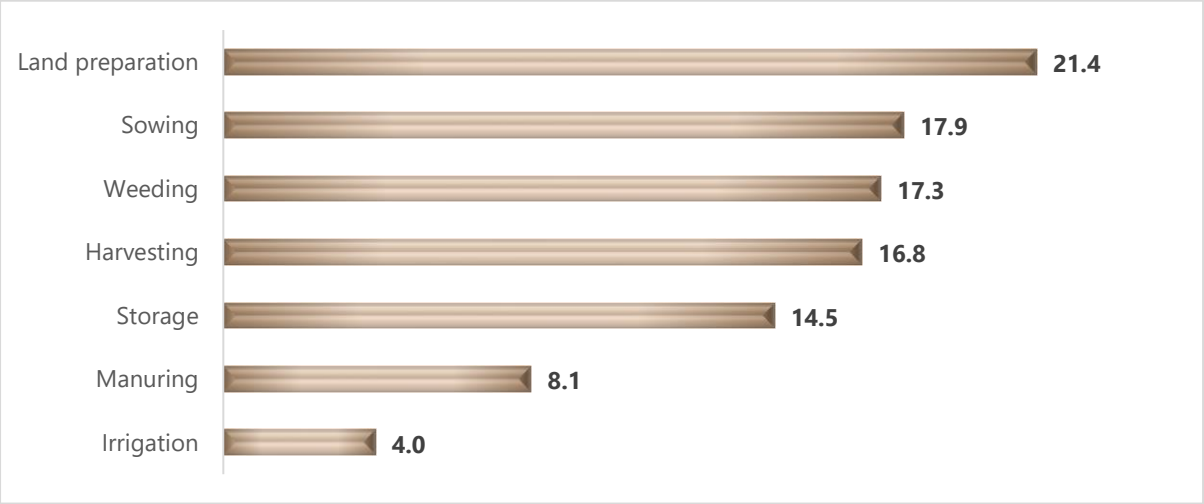
The findings of the project design adjustment resonate with those discovered in similar projects, specifically in the Agriculture Infrastructure Support Project (AISP) and Smallholder Crop Production and Marketing Project (SCPMP)[5]. As noted, there were delays in implementing infrastructure development, which necessitated changes in design leading to time overruns.

The implementation of a centre pivot system in the Shikabeta Irrigation Scheme, which spans 136 ha, has indicated a completion rate of 4.1% only. This accomplishment is far below the initial goal of 3,337.0 ha, missing the mark by a staggering 95.9%. Although the initial goal of implementing irrigation systems across all schemes was not fully achieved, the project proved successful in clearing a total land area of 3,344 ha in all schemes representing 100.2% performance. Some of the cleared lands were converted into rain-fed fields following the adoption of the Technologies for African Agriculture Transformation (TAAT) model.

In relation to the tenure of members affiliated with irrigation schemes, the finding revealed that the average duration of membership for members affiliated with irrigation schemes was 10 years. Gender-wise, male beneficiaries had a longer span of membership with an average of 12 years, while female beneficiaries had an average of 4 years. Moreover, the study revealed that the adult population had a longer tenure of 10 years compared to the youth population who had an average of 4 years. Furthermore, it was revealed that 77.1% of those belonging to the irrigation scheme participated in rain-fed agriculture, which was implemented by the scheme. Males were found to be more involved in rain-fed agriculture with 86.1% participation compared to female beneficiaries at 50.0%. The findings highlight the need for greater gender equity and youth involvement in irrigation scheme membership and related agricultural activities.

With regard to beneficiaries participation in rain-fed agriculture, majority participated in land preparation at 21.4% while the least was irrigation at 4.0%. See **Figure 4** for details.

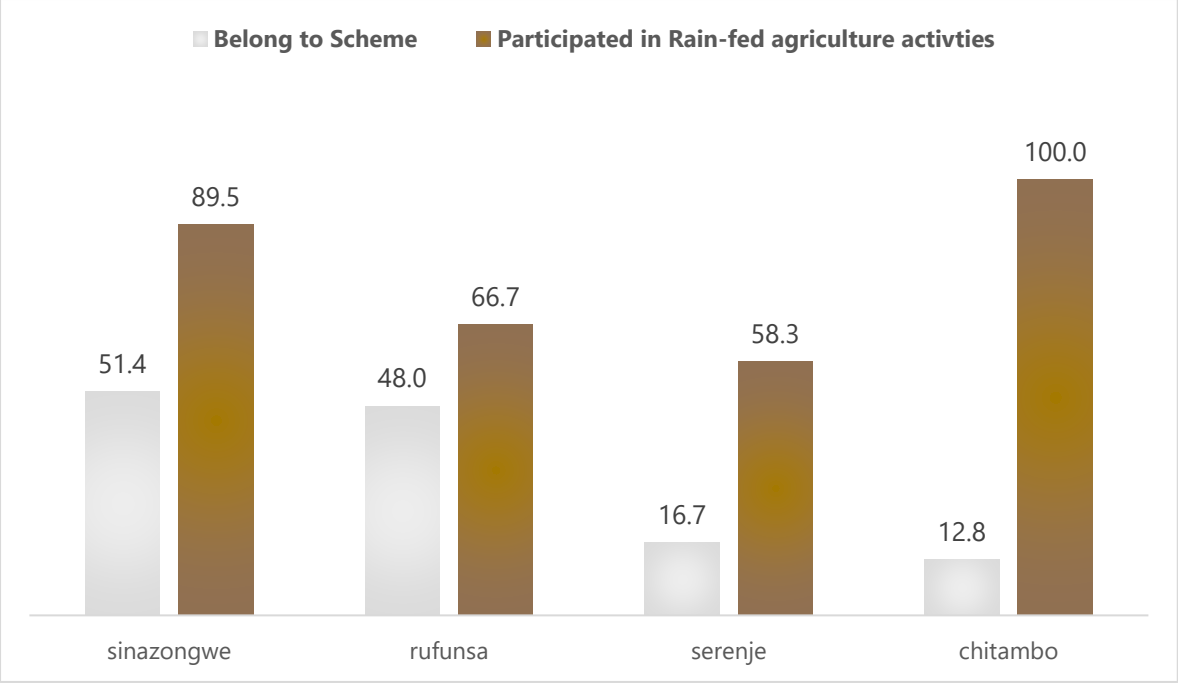
Figure 4: Type of rain-fed agriculture activities implemented by beneficiaries (%)



[5] SCPMP Appraisal Report

At the district level, Sinazongwe district had the highest proportion of beneficiaries who belonged to a scheme, whereas Chitambo district reported having the highest proportion of beneficiaries who had participated in rain-fed agricultural activities. It should be noted that during the data collection process, no sites under irrigation were visited by the Consultant in either Chongwe or Gwembe districts.

Figure 5: Beneficiaries who participated in rain-fed agriculture vs those belonging to the scheme (%)



In terms of training, the finding revealed that one-fifth of the participants acknowledged being trained in irrigation development. The data showed that the male participants were trained more than the female respondents with a margin of 5.5%. Specifically, 22.2% of males received training in irrigation development, while only 16.7% of females were trained in the same field. Additionally, the study found that only the adult population (20.8%) reported having received training. The inadequate training was reported by one respondent from Shikabeta Irrigation Scheme who narrated that "*the equipment was provided without adequate training on operation, usage, and repair. Despite assurances to select individuals among us to receive training, no such sessions were organized since 2018 until the present time*." Another participant from Siatwinda Irrigation Scheme reported that they did not receive any training. This lack of training across the schemes had a significant impact on their ability to effectively manage and maintain the equipment provided.

Insufficient training and inadequate funding to facilitate equipment repairs have resulted in some equipment provided by the project remaining unrepaired. Consequently, beneficiaries have been unable to utilize this equipment. A tractor parked at Shikabeta near the health centre stands as an example. The tractor awaits repair and has been out of service for nearly a year. Respondents from the Shikabeta Irrigation Scheme further narrated that the project supplied two tractors, but one is not working because the staff utilized some parts from the

tractor parked at the health centre to fit into the other movable tractor. See a defunct tractor mounted with a combine harvester in **Figure 6**.

Additionally, another intended objective of the project was to establish scheme management entities. These entities encompassed the formation of Water User Associations (WUAs) and companies with Boards of management. The aim was to create effective and efficient management structures that will enable proper supervision and organization of the schemes. The registration of companies was narrated by respondents from the Siatwinda Irrigation scheme in the Sinazongwe district stating that "*the formation of our company was prompted by the assurance that we, as farmers, would not be operating independently. Instead, we were promised that managers would oversee the company, which would be responsible for running three different schemes: Malima, Chimini, and Siatwinda. It was determined that a single company with a skilled manager would be best suited to manage all three schemes, and thus, we proceeded with the formation of the said company*". Similarly, at Shikabeta Irrigation Scheme, the successful establishment of a company was reported, with a manager and workers engaged to manage the scheme.

Figure 6: Tractor awaiting repair at Shikabeta Irrigation Scheme

Although companies and management entities have been established in each scheme, it has come to light that some schemes are lacking functional management on-site. One such case is that of Shikabeta, where the manager and workers stopped operations due to financial constraints that prevented the payment of their salaries. Consequently, the facilities were left in the hands of the camp extension officer and the guard. This situation highlighted the need for sustainable financial planning and management to ensure the efficient and effective operation of these schemes. The current management situation at the Shikabeta Irrigation Scheme aligns with the recent findings of McCarthy and Winters (2022)[6], indicating that despite well-built schemes and qualified management teams, irrigators are unable to generate sufficient revenue to cover the costs of operations and management, rendering these schemes ineffective. This issue is not limited to South Africa alone, where irrigation schemes equipped with advanced sprinkler systems were constructed, but the hasty and unorganized Irrigation Management Transfer (IMT) process resulted in rapid deterioration of many systems.

Sub-component 1.2 Aquaculture development

[6] McCarthy, N. and Winters, P.C. 2022. Building resilience to climate change in Sub-Saharan Africa through irrigation investments.Pulte Institute Policy & Practitioner Report No. 4.South Bend, IN: University of Notre Dame. https://pulte.nd.edu/research-policy/visiting-associates-program-publications/nancy-mccarthy/

The primary aim of the project was to enhance the livelihoods of 16,000 beneficiaries using 280 fish pens and 340 fish cages. While the fish pens were successfully assembled and installed, the project fell short of its intended target for fish cages, with only 170 out of 340 being assembled and installed, leading to a 50% achievement rate. This inadequacy was primarily due to the exorbitant cost of procuring the cages, which necessitated a reduction in the target number of cages.

Figure 7: Installed Fish Cage at Chipepo Harbour in Gwembe District

Furthermore, the project exhibited effectiveness in engaging the beneficiaries in the assembling and installation of fish cages and pens. This was highlighted by a respondent who stated that "*we collaborated with various cooperatives in the district, in conjunction with APMEP*." Another respondent corroborated this by stating, "*we were consulted and held multiple meetings with the project team, ultimately choosing to pursue aquaculture on our own*."

Despite the project's diligent efforts to consult with the beneficiaries on the assembly and installation of fish pens and cages, the findings revealed that only a mere 9.9% of the beneficiaries considered the provided cages and pens to be suitable for the community. This indicates that a substantial 90.1% of the beneficiaries expressed their dissatisfaction and found the cages/pens to be unsuitable for their cooperative/scheme. One of the reported points of dissatisfaction among the beneficiaries was the fishnets' vulnerability to crocodile attacks, due to the fragility of the nets. Several farmers did not consider the nets suitable for the local environment, unlike other options available in the market like those sourced from South Africa.

Figure 8: Nets provided by APMEP.

The other objective of the project was to offer support to the beneficiaries by providing them with fingerlings and fish feeds, which in turn, would enhance their productivity in the initial production cycle. However, certain issues surfaced regarding the timing and delivery of these

resources. Although the beneficiaries received fish feed, the delivery of fingerlings and feed was not synchronized, leading to the feed getting expired by the time the fingerlings were delivered. In addition, the project failed to deliver fingerlings during the optimal breeding period of October to November, instead, they were delivered in March, which caused disruption in the breeding cycle.

The highlighted setbacks had an impact on the effectiveness of the aquaculture component of the project. A respondent at the district level brought attention to the challenge, stating that "*the purchase of fingerlings and feed was not properly coordinated, as it was noticed that the delivery of feed took place before the delivery of fingerlings. Given that feed has a specific shelf life, it was determined to be more beneficial to have it delivered at the same time as the acquisition of fingerlings.*" Additionally, another obstacle to achieving sufficient fish production, despite the beneficiaries receiving the feed, was the insufficient fish feed sequence produced by the project. As recounted by one of the district officials, the proper feed sequence should have included.

1. Fry mash,
2. Crumbles,
3. Pre-starter,
4. Starter,
5. Granules, and
6. Finisher.

However, the Consultant's interactions with fisheries officers, it was stated that the project provided fish feed comprising 90.0% finisher, with the remaining 10% being a combination of fry mash and granules thereby hampering the fish's optimal growth resulting in low weight.

In terms of fish production and sales, the finding revealed that there was a decline of 28.6% in fish production, with the average production dropping from 3.6 tons in 2020 to 2.7 tons in 2022. Despite the decline in fish production, the finding also revealed that there was an increase of 7.4% in the average unit price, which increased from ZMW 28.67 to ZMW 30.88. Furthermore, even with the low production of fish, the average earning from fish production increased from ZMW 60,833.33 to ZMW 64,862.50.

Table 3: Fish production and sales at an individual level

Descriptions	2020	2022
Average Fish Production (tons)	3.6	2.7
Average Fish Sold (tons)	2.2	2.4
Average unit price (ZMW)	28.67	30.88
Average revenue from fish sales (ZMW)	60,833.33	64,862.50

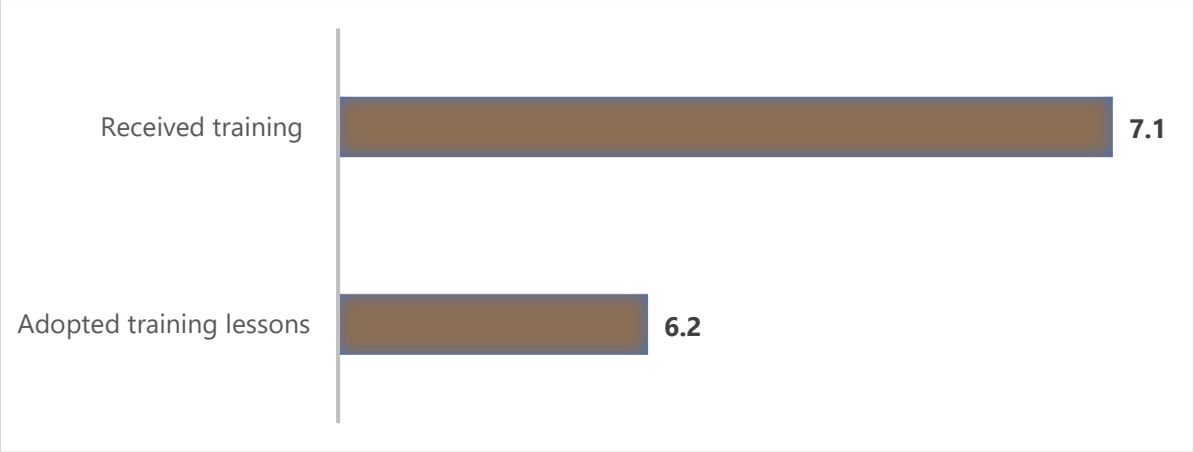
At the district level, a similar pattern was witnessed in fish production, whereby the tonnage of fish produced in the Gwembe district was higher in 2020 compared to 2022. Specifically, 8.3 tons of fish were produced in 2020, while only 4.6 tons were produced in 2022.

Further, the suboptimal yield exhibited by the individual members can be traced back to the fact that the sales were extended on credit terms to buyers who have yet to settle their dues since 2021. This consequently curtailed the availability of inputs required for the 2022 production cycle. This challenge was cited by respondents from community meetings who narrated that *there was a buyer who presented himself as trustworthy. He initially made purchases from other cooperatives before approaching us. Upon arrival, he informed us that he does not conduct cash transactions and requested our bank account details. He promised to deposit once he reached Lusaka after receiving the fish. However, he left without fulfilling his promise, and we have not heard from him since. It has been over three years, and we have lost over 80 thousand due to this individual's deceitful actions."*

Regarding the target, the Mid-Term Report revealed a downward adjustment in the target, from the originally projected 400 tons to 260, without explicit disclosure of the reasons behind this adjustment. Regarding production, data from the M&E unit indicated that cumulative fish production only reached 117.54 tons out of the targeted 260 tons, representing a 45% production level, despite the installation of all targeted fish pens and cages. The production of fish was impacted by multiple factors. Firstly, the delay in the delivery of fish feed caused a setback in the production process. Secondly, the absence of effective protective measures for the cages and pens resulted in losses due to the intrusion of wild birds and thefts by some members of the community. Furthermore, the acquisition of fish feed in a single batch had an adverse impact on the quality of the feed. This situation was exacerbated by the absence of cold storage facilities, resulting in additional losses. The deficiencies significantly impacted the overall quality of the fish feed.

In terms of ownership, the finding revealed that the ownership of the fish pens and cages is exclusively held by the cooperatives, with a 100% ownership rate. Further, the findings showed that a mere 7.1% of the beneficiaries in aquaculture have received training, with male beneficiaries receiving higher training rates than their female counterparts (10.6% vs 1.8%). Notably, only adults were reported to have undergone training, representing 8.8% of the respondent. These results highlight the need for increased training opportunities, particularly among female and youth beneficiaries, to enhance their participation and success in the aquaculture industry. In addition, out of the total beneficiaries who underwent training, only 6.2% of them effectively implemented the adopted lessons. However, when compared to the overall number of those trained, 87.3% of the beneficiaries had integrated the lessons from the training into their practices. These findings provide compelling evidence of the training program's effectiveness. Refer to the figure 9.

Figure 9: Beneficiaries trained against those adopting the training lessons (%)



Sub component 1.3 Crop Diversification and Intensification

Crop diversification and intensification are critical agricultural practices that have a two-fold benefit of yielding high crop production while also ensuring environmental sustainability. By strategically diversifying crops on a single plot of land and adopting modern farming techniques and technologies, farmers can significantly improve their effectiveness and profitability. The project has demonstrated its effectiveness in promoting crop intensification through its implementation of Conservation Agriculture (CA) techniques. Not only did the project surpass its initial target of 32,730.0 ha of an area under CA but it also achieved an impressive 40,548.2 ha, resulting in a success rate of 124.0%.

Figure 10: Mechanised land preparation at Lusiwasi Irrigation Scheme

Furthermore, the project proved to be successful in facilitating the adoption of mechanisation techniques by farmer cooperatives. As a result, an impressive area of 34,390.0 ha of land was under mechanisation, accounting for 49.8% of the intended target of 69,000.0 ha. This accomplishment showcases the project's effectiveness in aiding the agricultural sector and ensuring sustainable farming practices.

According to the findings, the average area allocated for maize cultivation by individual farmers during the 2020/2021 farming season was 1.8 ha, with 1.1 ha under CA and 0.3 ha utilized for mechanization techniques. However, during the subsequent farming season, the average planting area decreased, along with a decline in the adoption of CA and mechanization techniques. Furthermore, upon a cost assessment, it was revealed that expenses increased among beneficiaries who cultivated maize and rice crops. See **Table 4.**

Table 4: Summary of land under conservation agriculture and mechanization at an individual level

Crops	Average area planted (Ha)		Average Area under CA (Ha)		Average Area under Mechanization (Ha)		Cost of Mechanization (ZMW)	
	2020/2021 Farming Season	2021/2022 Farming Season	2020/2021 Farming Season	2021/2022 Farming Season	2020/2021 Farming Season	2021/2022 Farming Season	2020/2021 Farming Season	2021/2022 Farming Season
Maize	1.8	1.0	1.1	0.5	0.3	0.2	660.00	671.80
Rice	1.4	1.3	0	0.1	1.3	1.2	3506.25	4662.50
Cassava	0.6	0.6	0.3	0.4	-	-	-	-

The decrease in the mechanization of land can be attributed to various factors, including the apparent breakdown of the tractors and related components offered by the project. Unfortunately, the cooperatives lacked the means to service these machines, which resulted in their eventual malfunction and, subsequently, rendered them inoperative. Furthermore, the machinery provided by the project had fallen short of the community's expectations with regard to long-lasting durability. During the community meeting at the Lusiwasi Scheme, respondents shared their experiences regarding the tractors provided to them. It was mentioned that initially, they were provided with a functional tractor from 2019 until 2021. However, later on, another tractor was provided to them with additional components such as the disc, harrow, and planter. Unfortunately, the usage of this tractor was short-lived as it malfunctioned soon after. Similarly, the second planter provided to them could not be utilized due to damages. Furthermore, the combine harvester provided to them was also unsuccessful in its operation. This highlights the difficulties faced by the community in accessing equipment that can aid in their agricultural activities. Furthermore, the dissatisfaction with the provided equipment was narrated by a respondent who added that "*the machinery that was delivered to us appears to be fraudulent and had proven to be unreliable. Despite our best efforts, we have not seen any benefits from their use, and their faulty nature has caused numerous setbacks. Even the combine harvester, which was examined by CAMCO, has not been repaired and remains non-functional*"

Figure 11: Nonfunctional equipment at the Lusiwasi Irrigation Scheme

Certification Institute (SCCI). The project also supplied various seed crops such as rice, iron-rich beans, orange maize, etc. to farmers who participated in conservation farming and nutrition. The project's other notable activities included securing seed for a rain-fed crop in 2018 (limited to 5 schemes), 2019, and 2020 (across all schemes). As of 2020, the project had distributed 146,134 bags x 50kgs (7306.7 tons) of seeds to farmers against the target of 13,500 tons, equivalent to 270,000 bags of 50 kgs. However, for the 2021/22 season, the project did not provide any inputs to farmers as they were encouraged to procure their inputs from the profits generated in the previous season.

In terms of production, there was a higher level of production during the initial period of the project as compared to the following years. The low production among the beneficiaries was attributed to various factors including rainfall patterns, diseases, and inadequate inputs.

Regarding sales, the rice growers cited low prices as a major predicament. Furthermore, the low cultivation of rice in 2022, was narrated by one respondent from the Luombwe cluster in Chitambo who narrated that "*When we initially ventured into rice cultivation, our harvests were plentiful. However, since the decrease in fertilizer distribution, our yields have significantly decreased as we are unable to afford to fertilize all our fields. Unfortunately, the newer members of our cooperative have not been able to reap any benefits from our diminishing harvests*." Further, the harvesting of the rice was another challenge among the beneficiaries. One of the beneficiaries narrated the challenge thus "*in the year 2022, we incurred a loss due to poor sales. To assist us, APMEP provided us with a combine harvester. Unfortunately, this was during a period when the rice was dry, and the use of the combine harvester resulted in considerable damage to the crop. Consequently, we cannot utilize this harvester since it is not designed to operate in water. Thus, we require a specialized harvester that can function in water to enable us to harvest the crop before it dries up."*

Table 5: Summary of crop harvested vs revenue generated from sales

Crops	Crop Harvested (50kg bag)		Crop Sold (50kg bag)		Mone Earned (ZMW)	
	2020/2021 Farming Season	2021/2022 Farming Season	2020/2021 Farming Season	2021/2022 Farming Season	2020/2021 Farming Season	2021/2022 Farming Season
Maize	534	47	42	44	6296.94	8887.49
Rice	121	106	107	95	21502.25	1382.90
Cassava	45	46	35	42	10521.12	14,700

One of the biggest impacts the project has had is the Rice project in Chitambo. The crop was first introduced around 2016/2017 and went on to become the biggest plantation in Zambia (2020/21). The incomes resulted in many farmers buying assets such as bicycles, solar panels etc. This story needs to come out clearly

Sub component 1.4 Livestock Development

The activities carried out in this component focused on empowering 180 women groups, accommodating 3,600 women, along with 30 youth groups, comprising 600 youths. To oversee the livestock pass-on program, the services of Heifer International, a non-governmental organization, were engaged. The outcome of this collaboration led to the mobilization and evaluation of 80 livestock pass-on groups, consisting of 71 women and nine youths.

Based on the finding, it was reported that 30% of the respondents claimed to have associated with a livestock scheme with a greater number of male beneficiaries (36.0%) than their female counterparts (21.8%). These results indicate the existence of gender inequality within the realm of livestock schemes. In relation to age, the finding revealed that a higher percentage of youths were affiliated with the livestock program in comparison to the adult demographic (46.7% versus 25.7%).

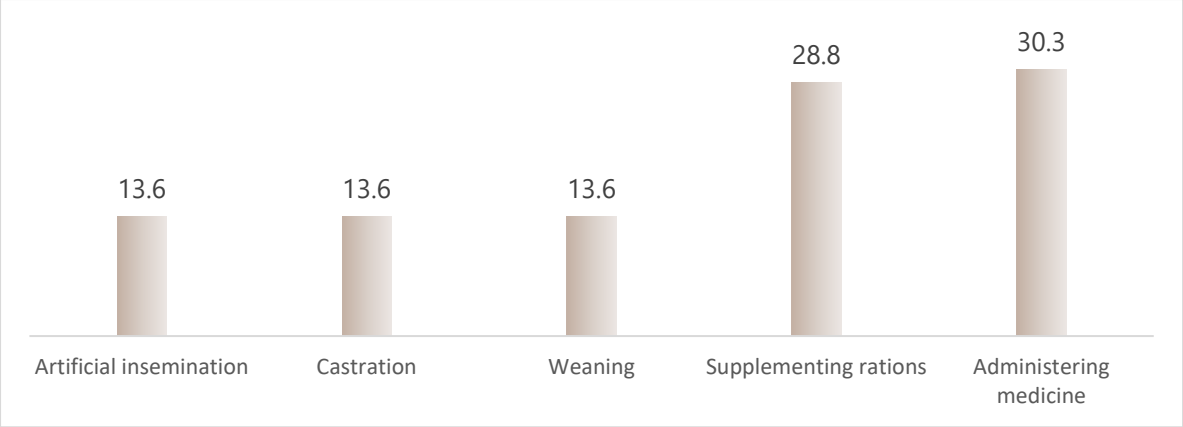
The project also established 6 livestock service centres across the 6 districts and provided training to beneficiaries in collaboration with Heifer International. In terms of training on livestock development, the finding revealed that 59.6% reported having received training on livestock with the male being higher than their female counterpart (68.8% vs 40.0%). In relation to the distribution of age, the finding revealed that the youth population had a higher attendance rate in training compared to the adult population (66.7% vs 57.9%). The finding also revealed that 92.9% of respondents who have received training have implemented the lessons/practices acquired, with a greater proportion being male and adult beneficiaries. See **Table 6** for details.

Table 6: Proportion of beneficiaries trained/adopted lessons on livestock development (%)

Description	Male	Female	Youths	Adults	Total
Received training	68.8	40.0	66.7	57.9	59.6
Adopted the practice from training	95.5	83.3	83.3	95.5	92.9

Based on the findings obtained from the training sessions received by the beneficiaries, it can be inferred that a substantial proportion of the lessons were focused on enhancing the quality of rations and administering medications, with a notable emphasis of 38.8% and 30.3%, respectively. These results signify that the training program accorded the highest priority to these areas. See Figure 12 for details.

Figure 12: Lessons learnt from the training on livestock development.



In terms of accessibility to livestock service centres and other supported services, such as chaff cutters, the finding indicated that 80.0% of the beneficiaries were able to access livestock service centres, while 14.9% had access to chaff cutters. It was observed that males and youths had a higher rate of access to these services compared to females and adult beneficiaries. This trend was also noted in the beneficiaries who had access to chaff cutters, with male and youth demographics having greater access than their female and adult counterparts.

Table 7: Access to Livestock services supported by the project (%)

Description	Male	Female	Youths	Adults	Total
Access to Livestock	84.6	50.0	100	76.9	80.0
Access to the government chaff cutters	18.8	6.7	11.1	15.8	14.9

in terms of cattle ownership as of 2020, it was reported that 58.3% of the beneficiaries had cattle. On average, each beneficiary owned 7 cattle in 2020 and 2022. The capacity for cattle ownership was also reported to have increased among the beneficiaries, with the maximum capacity increasing from 25 in 2020 to 42 in 2022. Furthermore, the findings indicated a noticeable increment in earnings among the beneficiaries. On average, the earnings increased from ZMW 5,666.67 to ZMW 5,983.33. These results indicate a positive trend in the beneficiaries' financial status and their capacity for cattle ownership. See Table 8 for details.

Table 8: Cattle Ownership among the beneficiaries

	HH owned in 2020	HH owned in 2022	HH sold in 2020	HH sold in 2022	Earning 2020 (ZMW)	Earning 2022 (ZMW)
Average	7	7	2	2	5666.67	5983.33
Minimum	1	1	1	1	5000.00	1100.00
Maximum	25	42	2	10	7000.00	8000.00

Regarding the beneficiaries being able to pass on the cattle, it was acknowledged by the community that the project had distributed dairy cows specifically for the pass-on scheme. One respondent shared their positive experience, stating that "*APMEP provided us with dairy cattle, which has allowed us to engage in milk production activities. These dairy cattle were provided to us on a Pass-on Scheme Basis*." Additionally, Kamutonka Multipurpose Cooperative in Chongwe testified to the effectiveness of the pass-on scheme, citing that "as of 2020, we are now in the third round of the pass-on scheme."

During the evaluation of the cooperatives' methods for ensuring an equitable distribution of cattle, it was revealed that selection mechanisms were put in place. This was cited by respondents from Kamutonka Multipurpose Cooperative who stated as follows, "*we utilize a random selection procedure, whereby papers with "YES" or "NO" written on them are placed in a box, and the individual who selects a paper with "YES" is assigned an animal." This demonstrates a conscious effort on the part of the cooperatives to implement a transparent and unbiased procedure for cattle allocation*. Similarly, the selection process at the Sola-Sola Multipurpose Cooperative in Gwembe, was the lottery method. As per the Gwembe district completion report, the procedure involved the recording of both the names of the calves and the beneficiaries who were passing them on, onto small pieces of paper. These papers were then deposited into a container, following which the beneficiaries were requested to pick a paper from the container. The name written on the selected paper would correspond to the animal that the beneficiary would receive.

As for milk production, the findings showed milk yield during both dry and wet seasons, from 2020 to 2022. Despite the consistent production, a rise in milk supply was observed, from 11.5 to 12.5 litres. Furthermore, the average price and daily revenue earned per litre of milk demonstrated an upward trend. These results reflect a favourable trajectory in the industry and are suggestive of a bright future for milk production.

The project also provided pasture seeds and in addition training for farmers

Artificial insemination kits and veterinary sets were provided by the project, also training was provided

Table 9: Summary of milk production and sales

	Average milk yield per day (Dry Season)	Average milk yield per day (Wet Season)	Average litres Supplied for sale/day	Avegae unit price	Average money realised per day
2020	8.4	14.0	11.5	8.8	102.46
2022	8.3	14.0	12.5	9.6	118.42

The Project achieved a significant milestone by procuring 88 Vet Kits for the districts. In addition, the beneficiaries were allocated 30 Artificial Insemination (AI) Kits and 20 motorized folder equipment, further enhancing their productivity. As a way of providing additional support to the farmers in Chongwe and Gwembe Districts, the Project also distributed approximately 600 kg of pastures and fodder bank planting materials.

Figure 13: Beneficiaries of local chickens under the pass-on scheme

The Project had an additional objective of providing support to activities such as the management of village/local chickens, provision of stable thermal Newcastle vaccine, and execution of vaccination campaigns through community animal health workers and community livestock assistants. As a result of the implementation process, 65 groups focused on poultry-keeping were established, and the pass-on programs for poultry, which were introduced in 2018, initially distributed 5,000 chickens. Currently, the pass-on scheme continues to benefit over 1014 families, with a substantial number of pass-ons witnessed, distributing an impressive 4,550 chickens in Serenje and Chitambo..

Component 2: Value Chain Development and Market Linkages

Sub component 2.1 Agro-processing Infrastructure Development

- Establishment of Chitambo Cassava Milling Plant

Under this sub-component, the Project was to establish two small-scale maize and feed mills, as well as two small-scale cassava mills, managed by dedicated business entities. A milestone was achieved under this component, as the Project successfully established a medium-scale Cassava Processing Plant in the Chitambo District. The plant has an impressive processing capacity of 30 metric tons of cassava daily.

Figure 14: Cassava Milling Plant in Chitambo

Despite facing financial constraints, the Project exhibited resourcefulness and innovation by modifying the original design. This led to the

redirection of funds previously allocated for small-scale maize mills towards the acquisition of a medium-scale cassava mill. On September 15, 2021, the Government officially took possession of the Cassava Mill, which is constructed and equipped with a warehouse, factory, receiving area, concrete water tank with two boreholes and tank stand, perimeter fence, guard house, dry and wash area, boiler, shelter, and generator set shelter, restaurant, wastewater treatment reticulation, and offices.

To ensure proper management and ownership of Chitambo Cassava Milling, the plant was registered as a Private Limited Company owned by the Government through the Industrial Development Corporation (IDC). The establishment of the Chitambo Cassava Milling plant was regarded as a noteworthy achievement by one of the respondents, who stated that *"the Chitambo cassava milling plant has been the only success story under APMEP's marketing and business domain. This is because the Project has invested all its resources in ensuring that the plant can efficiently process cassava from Serenje, Chitambo, and, potentially, Luapula Provinces."*

- Agriculture Service Centres

The Project was to establish 6 small-scale agriculture services (agro markets) and revamping 12 existing road markets. Additionally, the project aimed to rehabilitate 50 km of rural feeder roads. The engineering design phase was completed. However, the tendering process was unfortunately suspended due to resource constraints. The adjustment on this component was also highlighted by a respondent who narrated that *"the project activity of establishing a roadside market for the farmers to sell their agricultural products was designed with the objective of upgrading the facilities, shelters, sanitation, and lighting to enable the farmers to sell their products throughout the night. However, it was discovered that the allocated funds fell short of the required amount, eventually eliminating these activities."*

- Community level-processing equipment

The Project was to acquire value-addition equipment for women and youth groups at the community level. As part of this initiative, the Project successfully procured 40 honey presses and 70 solar dryers, which were efficiently distributed among the intended beneficiaries. It is a thing of joy that the Project's success rate has been a commendable 100%. However, the finding indicated that only 23.8% of the beneficiaries found the value-addition equipment beneficial. Among the beneficiaries, males reported a higher rate of benefit (27.5%) compared to females (18.9%). The youth category reported a higher rate of benefit (31.6%) than the adult population (22.6%).

The outcomes of the project's value-addition equipment revealed that the Rice Polishing Machine (64.7%) provided the most benefits among all the equipment. Notably, most of the female beneficiaries were the primary beneficiaries of this equipment as compared to their male counterparts. However, the groundnut roaster, on the other hand, had the lowest number of beneficiaries, with only 5.9% of the population having benefitted from the equipment. See **Table 10**.

Table 10: Types of value-added equipment that respondents benefitted

Value addition Equipment	Male	Female	Youths	Adults	Total
Oil Expeller	25.0%	10.0%	0.0%	25.0%	20.6%
Groundnut Roaster	8.3%	0.0%	0.0%	7.1%	5.9%
Rice Polishing Machine	58.3%	80.0%	100.0%	57.1%	64.7%
Vegetable Solar Drier	8.3%	10.0%	0.0%	10.7%	8.1%

Upon evaluation of the beneficiaries' ability to utilize the value-addition equipment provided to their cooperative/scheme and their capacity to raise funds from the equipment, the finding revealed that a majority, 72.1%, found the equipment unsuitable for their community. Furthermore, 77.6% of the beneficiaries reported inability to generate any revenue from the equipment provided.

Market Linkages

The project aimed to extend support to 60 proficient Agro dealers via matching grants. This activity could not be carried out and funds for it were effectively channelled towards other pivotal activities.

Component 3: Institutional Strengthening

Sub-component 3.1 Nutrition Security and Capacity Building

- Nutrition education and outreach to the participating communities.

The Project was to provide nutrition education and outreach to the communities involved through a food-based approach. This was achieved by training community nutrition and health workers, with particular focus on empowering the female population, which comprised 80% of the target audience. The project's scope included 550 female-headed households (FHH) and 1,210 male-headed households (MHH) in nutrition. Remarkably, the project achieved an outstanding result of 112% by successfully training 653 FHH in nutrition. Similarly, 7,658 MHH were trained, achieving an impressive 633% target completion rate.

Figure 15: Cooking demonstration for mothers with undernourished infants

According to the finding obtained from the sampled population, it was revealed that 54.24% of the beneficiaries received training, with a higher percentage of female beneficiaries (88.6%) compared to male beneficiaries (21.6%). In terms of age distribution, the findings showed that a larger number of youths received training (88.2%) compared to adults (43.6%). Furthermore, the finding revealed that majority of beneficiaries (97.4%) adopted the practices learned from the training on nutrition enhancement.

- Orange-fleshed sweet potato vines and other inputs

The Project had set out to provide orange-fleshed sweet potato vines to a total of 13,000 women and 2,000 men across all 6 target districts. While approximately 400 bundles of these vines were successfully distributed, the initiative showed itself to be both costly and unsustainable. Inputs were sourced from a centralized research station in Luapula Province (ZARI Mansa) and then dispatched to the respective APMEP implementing sites. To encourage local involvement, farmers in each district were identified and selected for vine multiplication training, to enable them to supply vines to fellow farmers within their communities at a reasonable cost. Unfortunately, this approach did not prove to be a long-term solution, as vine multipliers were unable to continue production due to the limited market demand.

In addition to achieving its objectives, the Project successfully delivered a combined total of 3284 kg of orange maize, 6568 kg of 50 kg D compound, and 6568 kg of 50 kg Urea fertilizer to all 6 districts. In addition, the program allocated 1,735 kg of iron bean seeds for multiplication to beneficiaries, mostly female beneficiaries, at both individual and group levels. These beneficiaries were primarily those with malnourished children based in the child feeding centres and other APMEP-supported sites. Furthermore, the initiative provided various types of vegetable seeds and fruit seedlings, along with accompanying chemicals. These beneficial

provisions were mainly directed towards the 4 main schools and 2 child feeding centres within each district.

- Infants (6-24 months) on feeding programme

The Project also facilitated the rehabilitation of malnourished children and provided comprehensive training to affected households on optimal infant and young child feeding practices. In addition, the project implemented the distribution of food rations such as soya beans, cowpeas, groundnuts, milk, cassava milk, kapenta, caterpillars, and sugar. Furthermore, cooking utensils and anthropometric measuring equipment were procured and distributed to the Child Feeding Centres, ensuring proper and accurate measurements of the children's progress.

A comprehensive scheme was implemented to train and equip 120 members of the community to identify and manage cases of malnourished children. A fraction of these volunteers received 60 bicycles as a means of transportation. During feeding sessions, mothers or caregivers received training on appropriate feeding practices for infants and young children. Also, infants between 6 and 12 months of age, who were malnourished, were enrolled for feeding while their weight was closely monitored for potential discharge after rehabilitation. The project achieved an enrolment of 1,356 malnourished children (aged 6-24 months) across 12 facilities, representing 63% of the set target of 1,600 malnourished children.

Despite the efficacious enrolment of children and procurement of equipment for anthropometric measurements, the children centres demonstrated inadequacies in their record-keeping practices. This insufficiency was apparent in the incomplete and missing data that was detected in the anthropometric measurement records. Additionally, the utilization of a single book for recording attendance, minutes, and anthropometric measurements posed a challenge due to the absence of a well-defined record-keeping system.

Overall Sub-Component Rating

The evaluation of the Project's effectiveness yielded a satisfactory rating, with all criteria being met. However, the assessment did identify a few minor shortcomings. One stakeholder highlighted that there were some implementation challenges due to country systems with inherent delays. Despite this hurdle, the project's overall performance was still deemed satisfactory. Additionally, another stakeholder commented that while the project was well-designed, some coordination and management issues hindered the achievement of desired outcomes.

5.1.3 Project Efficiency

This evaluation criterion serves as a valuable tool for stakeholders to comprehensively comprehend the strategic allocation of project resources, including funds, human resources, time, and expertise, to effectively achieve desired outcomes. A pivotal question addressed by this criterion is the level of efficacy with which inputs have been transformed into corresponding outputs and outcomes. Inputs include financial resources, time, and staff while outputs are actual results such as Area under mechanized agriculture (ha), No of scheme management entities etc

- Project Implementation against the work plan

The Project experienced a series of setbacks that impeded its progress, leading to several extensions to complete outstanding tasks. The delays were attributed to several factors, including delayed project inception that required significant time to establish the Project Implementation Unit (PIU), procurement delays, and the challenging circumstances brought about by the Covid-19 pandemic and the 2021 General Elections in Zambia. These factors significantly disrupted the project's original work plan.

The Aide-Memoire of Project Supervision of 2020 brought to attention delay in procurement, emphasizing that the procurement plan's implementation exhibited weak adherence to the specified timelines, consequently posing a challenge to the overall implementation. In addition, the PIU was advised to remain vigilant of the remaining procurement window and take necessary measures to process all pending contracts within the set time.

The project's execution was significantly disrupted by the global Covid-19 pandemic in 2021. Like many other countries, Zambia enforced Covid-19 restrictions that mandated social distancing measures. Consequently, numerous organizations ceased operations and adjusted to the Covid-19 guidelines temporarily. Furthermore, 2021 was an election year in Zambia, which led to a change in government and subsequent management changes at both the Ministerial and Permanent Secretary levels. These factors significantly affected the Project's implementation, resulting in the transfer of the Project Coordinator and some SMSs from the Ministry of Agriculture. As a result, the program encountered negative consequences, and the situation caused a stall in program implementation, ultimately resulting in the project being red flagged. The PIU left in March 2022 and a new team appointed to manage the new project. The project Coordinator was also transferred bringing in a new team altogether

- Relationships and Coordination with Partners

The implementation of certain activities of the project relied heavily on the expertise of subject matter specialists (SMS). Unfortunately, this dependence on their availability hindered progress on multiple occasions since their primary work commitments took precedence. As a result, the project faced delays beyond its control. The importance of SMS cannot be overemphasized, as highlighted by a respondent who expressed that the SMS has the responsibility of providing the appropriate specifications before any procurement takes place. For example, if one needs a goat, the SMS should furnish the procurement team with precise

specifications. Similarly, in case of engaging a consultant, the SMS should develop detailed terms of reference.

- Project Expenditure

The funding for the Project amounted to a total of US$36.26 million. This includes a significant sum of US$31.12 million that originated from the original grant, along with US$3.6 million in Counterpart funds and US$0.14 million allocated for beneficiaries' contribution through the provision of community-level structures and associated maintenance. Another US$1.4 million was committed to Mitigate the Impact of COVID-19 on Household Food Security, resulting in the project's duration being extended to June 30th, 2023.

As of 31 May 2023, the current disbursement rate was at 89% (98.92% on the original grant and 18.87% on the additional grant with another US$ 406,387 committed to contracts already sent to the Bank bringing the disbursement rate to (48 %)

Overall Sub-Component Rating

Based on the stakeholders' assessment of the Project's efficiency, it was deemed Unsatisfactory, indicating that some of the project objectives were not met. Specifically, the stakeholders have identified that the processing of critical resources was unreasonably time-consuming, leading to impractical procurements.

5.1.4 Project Impact

The evidence of emerging impacts has been methodically classified into distinct sub-components, as per the project's design. Additionally, the report has incorporated feedback from beneficiaries and other stakeholders, along with relevant sections of monitoring reports, to provide concrete evidence of the transformations taking place and the potential challenges they present to their impact. This comprehensive approach reinforces the report's principal finding. What are the main reasons for this? One of the major issues were procurement delays and change of government

Irrigation Development

The Shikabeta Irrigation scheme has the potential to increase crop production and improve the livelihood of the community with all operations as intended in the project design. Some of the aspects affecting the optimum impact were the models/structures (management entities) that were planned to manage larger-scale facilities and infrastructure established under the Project were not as adequate as envisioned. This has resulted in schemes not utilising the support to capacity as the management entities had challenges in raising funds to optimum run the irrigations. In the case of the Shikabeta Irrigation Scheme, the management entities experienced difficulties in funding their operations, leading to a situation where they were unable to pay their salaries and ultimately had to stop working. This unfortunate development has hindered the progress of the Project and has prevented the community from reaping the full benefits of the irrigation system.

The insufficient financial resources allocated for the electrification of the Shikabeta Irrigation project have had a detrimental effect on the performance of management entities and the scheme's ability to fully utilize its production capacity. The cleared land has become overgrown with plants and grass, which ultimately undermines the cost-effectiveness of the project activities since the land will have to be cleared again when operations recommence. See **Figure 16** for details. Additional adverse effects of the Shikabeta Irrigation Scheme include the delegation of the responsibility for overseeing the facilities and equipment to the camp extension officer and the guard, resulting in insufficient supervision, and leaving the equipment and facilities vulnerable to potential perils such as theft, fire, and vandalism. The community raised concerns over this threat during the

Figure 16: Shikabeta Irrigation Scheme's Centre Pivot submerged in dense vegetation.

community meetings, citing the overgrown grass and inadequate supervision as contributing factors that put the equipment at risk of catching fire.

The clearance of land for irrigation had both beneficial and detrimental effects. On the positive side, the Project facilitated the adoption of rain-fed agriculture by the intended beneficiaries, as the cleared land allowed farmers to avoid expenses associated with land clearing. However, on the negative side, this had an adverse unintended impact on the beneficiaries in cases where irrigation systems were not implemented according to the project design. This led to dissatisfaction among community members who felt left behind as their land was cleared, resulting in the loss of non-forest products. The insight into the loss of non-forest products was cited by some of the beneficiaries thus "*The land from which we once gathered mushrooms has now been depleted of them. Even to this day, mushrooms remain absent from the area*."

Aquaculture development

The implementation of fish cages and pens in the project has yielded a positive impact on the revenue earned by the beneficiaries, presenting an opportunity for the conservation and expansion of the fish population. This has led to an increase in profits, as stated by a respondent during an interview. The respondent emphasized that "the implementation of fish pens and cages has played a pivotal role in generating income for the beneficiaries." Another respondent added that "it has been observed that poverty can be alleviated through diligent effort in fish farming, given the challenging circumstances of crop farming due to recurring droughts. The introduction of fish farming has enabled us to provide education for our children." The initiative has proven to be a sustainable solution for the community, generating economic development and promoting education.

The implementation of fish cages and pens has presented an opportunity for beneficiaries to secure loans from the Citizens Economic Empowerment Commission (CEEC). This was shared by members of the cooperative in Chipepo, Gwembe district, who recounted that "*following a significant loss due to fraudulent activities, we collaborated to devise a solution. This led us to consider the possibility of obtaining a loan from CEEC to fortify our business. We are pleased to report that some members were able to successfully access the funds.*" In terms of the sum received, records from the Fisheries office in Chipepo showed that an aggregate of ZMW 115,000.00 was loaned per individual.

Crop Diversification and Intensification

The mechanization component of the project had a positive impact on the beneficiaries, as it enabled them to expand their fields using the provided tractor efficiently and effectively. Despite the farmers' prior knowledge of mechanization innovations, the Project provided a significant opportunity for them to access this valuable resource. The benefit was evident from a KII interview at the district level, who narrated that "*due to the implementation of mechanization within the project, the procurement of tractors has allowed farmers to expand their workable land, which previously could not have been done with the use of traditional hoes. As a result, the automation of the project activities has greatly aided in its productivity and success*."

Mechanization has proven to be a pivotal factor in the diversification of crops. The emergence of modern equipment has provided farmers with the ability to cultivate a diverse array of crops, once challenging to grow. In the past, the dearth of efficient tools had forced farmers to rely on growing only a few staple crops. However, with modern equipment, farmers can expand their crop range and significantly improve their harvest yield. The importance of tractors among rice farmers has increasedand private service providers have started offering tractor rental services to meet the demand for tillage services. This development underlines the private sector's significant role in addressing the agricultural industry's operational needs, particularly in the rice production sector. This was evident from the KII discussion at the district level, where it was statedthat "*as the utilization of rice production increased, the tractors previously procured became inadequate, leading to the involvement of private service providers. Due to the high demand for tillage services, this opportunity has benefited 11 service providers who currently offer their services to the farming community as a business*."

Livestock Development

Livestock Service Centers (LSCs) hold immense potential for providing significant benefits to their beneficiaries. These centres serve as a valuable resource for livestock farmers, offering them enhanced access to training, capacity-building opportunities, and top-tier veterinary services. Despite encountering certain challenges, LSCs have emerged as indispensable assets for farmers, equipping them with the necessary tools and expertise to augment their farming practices. Furthermore, the availability of veterinary services has remarkably improved the quality of care and treatment extended to livestock, guaranteeing their overall health and well-being. A respondent cited the benefits, stating *that livestock farmers have gained increased knowledge and access to information on how to care for their livestock*. The success story of the Muchinka Multi-Purpose Cooperative in the Chongwe district highlights the advantageous outcomes of the Project. As reported by the cooperative, the Project has facilitated the implementation of a 'spray-race' facility which has drastically reduced the prevalence of cattle ailments such as anthrax, corridor disease, lump skin, and other related diseases. Although initially unfamiliar with this innovative technology, the Cooperative has since acknowledged its value and benefits.

The training guided chicken production, including the proper set up of poultry houses with recommended width and length, techniques for preventing diseases such as Newcastle, worms, and gumboro, as well as vaccination and nutrition strategies. According to the findings, most recipients reported adopting the training and experiencing its impact. This comprehensive training increased the awareness of beneficiaries in terms of poultry care and resulted in positive outcomes. One of the beneficiaries shared his experience as follows, "*Our village used to experience a high mortality rate among our chickens prior to the Project. However, after receiving the training and support from the officers, we have witnessed a significant improvement in the health and survival rate of our chickens*."

Value chain development and Market Linkages

The implementation of the Chitambo Cassava Milling (CCM) is a clear indication of the initiative's effectiveness in augmenting the value-addition process of cassava. Although the milling operation is yet to begin, its advantages have already made a significant impact on cassava cultivators in the Chitambo district. The establishment of the CCM has acted as a catalyst for enterprising farmers who are keen on expanding their fields, offering them a fresh avenue to market their cassava.

This pioneering endeavour inspired farmers to seize the opportunity presented by the CCM initiative and harness its potential for their benefit. The benefit was also highlighted by the district's personnel indicating *that "Cassava is a major crop in Chitambo district, and the introduction of a milling plant has created exciting opportunities for farmers. With the plant set to open soon, farmers will have a guaranteed market for their harvest. Witnessing the start and finish of the plant has already resulted in many farmers expanding their fields, eager to capitalize on this new opportunity. As a result, the fields of Cassava in the Chitambo district continue to grow, promising a prosperous future for local farmers."*

The CCM Five Year Strategic Business Plan puts the spotlight on the immense potential of Chitambo Cassava Milling. The plan outlines a comprehensive strategy to introduce a line of top-quality products such as cassava flour meal, starch, and animal stock feed into the market. The implementation of this strategy involves engaging with various players in the industry, like transporters, retailers, and wholesalers, to create a multi-value impact on the economy of the area. This plan presents a significant opportunity for the region's economic growth and prosperity.

The prime location of Chitambo, which is near neighbouring countries, presents a compelling investment opportunity. This strategic placement provides an ideal export market for the company's cassava products, as transportation and distribution will be more efficient with easier access to both the Tuta Road to Mansa - linking to the Democratic Republic of Congo - and the Tanzam Highway leading to Lusaka and Dar es Salaam in Tanzania. Chitambo district's straddling of these critical transportation routes makes it the perfect site for investing in the production and distribution of cassava products.

Regarding the creation of job opportunities, the milling plant possesses the capability to hire a total of 31 personnel to manage the plant's daily operations. This projected workforce is anticipated to earn a combined monthly salary of ZMW 249,060.00, thereby showcasing the potential to enhance the standard of living through increased income generation.

<u>Nutrition Security and Capacity Building</u>

The establishment of Child Feeding Centers across designated?, resulted in the rehabilitation of 1,356 malnourished infants. Moreover, the project provided crucial training to affected households on appropriate Infant and Young Child Feeding practices. These achievements have significantly contributed to addressing the issue of malnourishment in the targeted communities.

<u>Overall Sub-Component Rating</u>

As per stakeholder feedback, the project has been rated as satisfactory, with all criterion dimensions met. However, minor shortcomings were noted in some areas. This feedback informs us that while the Project has positively impacted stakeholders, there remains room for improvement.

5.1.5 Project Sustainability

This section outlines the assessment of the Project's projected benefits and risks, focusing on the potential long-term impact beyond the project's duration. The goal is to present a comprehensive analysis of the anticipated benefits, considering the potential risks associated with the Project. The Consultant aims to provide a clear understanding of the extent to which the project benefits extend beyond its lifespan.

The utilization of the Project to conduct training for district and community personnel by enhancing capacity across the various components presents a model that can sustain continuous sensitization through the district action plans. This approach serves as a viable means to build and reinforce skills and knowledge among beneficiaries, thereby fostering long-term growth and development for the greater community. As such, this strategy demonstrates the considerable potential for creating lasting impact and achieving meaningful outcomes.

The sustainable pass-on scheme initiative implemented by the project has proved to be a promising model that operates under sustainable principles. The beneficiaries who received chicken and dairy cattle have passed them on to others, and the results have been impressive. The implementation has been a great success and a demonstration of the diligent adherence to the principles of sustainability by the beneficiaries. However, it is important to note that the pass-on scheme model was facilitated through the guidance of an NGO, Heifer International Zambia. This raises the question of whether the momentum will remain once the NGO is no longer involved.

The collaboration between Cooperatives and Community Markets for Conservation (COMACO) was a commendable approach towards establishing a sustainable market for all the produce. This partnership has the potential to inspire the growers to participate actively, promoting healthy competition and ensuring improved quality among them. Furthermore, a notable sustainability strategy with the potential for widespread adoption is the utilization of the CEEC as a source of capital for beneficiaries. By intensifying this approach, beneficiaries can unlock opportunities for scalability. This presents a promising avenue for businesses seeking to expand and succeed.

The CCM project is set to become a highly profitable endeavour for cassava growers. Its well-defined objectives and potential to generate ZMW 75,180,000 in revenue in the first year and ZMW 150,360,000 in the fifth year make it a vital market for cassava farmers not only in Chitambo but throughout the entire country. Not only will this project provide a much-needed market for cassava farmers in Chitambo and throughout the country, but it will also lead to significant growth in the agricultural industry and boost economic activity. The seamless operation of the CCM project will play a vital role in the development of the agricultural sector and contribute to the overall economic growth of the region.

Other interventions, such as the establishment of a child feed centre, have demonstrated their efficacy and provided valuable frameworks for similar projects to draw insights. While the provision of food rations played a critical role in achieving successful enrolment rates, the sustainability of these feed centres poses a significant challenge. The issue of sustainability

must be addressed to ensure their continued success, as challenges arose when the rations were exhausted, which served as the sole source of food for those being served. Therefore, it is imperative to institute measures that guarantee the sustainability of these centres.

Overall Sub-Component Rating

The project has received a satisfactory rating based on stakeholder feedback on sustainability, with all criterion dimensions having been met. Nonetheless, minor deficiencies were identified in certain areas.

6.0 CROSSCUTTING ISSUES

- Gender

The inclusion of gender in the project implementation was a crucial aspect carefully considered and incorporated into the project design across all components. The remarkable results indicate that the Project meticulously adhered to and followed the lesson highlighted in the Zambia GAFSP APMEP Appraisal Report Volume? Regarding male involvement, it was observed that men tended to be particular in some activities pertaining to the nutrition component. For example, while men dominated agricultural-related activities, their participation in cooking activities was comparatively lower. This underscores the fact that men tend to choose their areas of involvement based on traditional gender roles. This was evident from the KII interview, where the respondent narrated that "*We organized a cookery demonstration where most of the participants were mothers who functioned as caregivers. However, it was observed that male participation was quite minimal as they tend not to consider cooking as part of their responsibilities, particularly in rural areas*."

The gender discussion during KII reviews shed light on crucial considerations for gender inclusion. According to the review, The Bank Group Gender Strategy for 2014-2018 laid out essential minimum standards for the integration of women and youth in all project activities. Project implementers were urged to ensure that at least 40% of women were invited to participate in training sessions, and a specific percentage of receipts were allocated to women for input. However, due to the physical and social impediments faced by women and youth, achieving these standards was not always feasible. Despite this, there was a recommendation for those responsible for project implementation to present data separated by gender in their reports. It was deemed essential to pay adequate attention to gender-related aspects to guarantee inclusivity and gender equity in the project's implementation. This commitment to such considerations was evident in all relevant reports and outcomes, and it played a vital role in creating an environment of fairness and equity.

- Environmental and Social Management

The Project's direct impact on the environment, particularly on ecological changes and land degradation due to civil works and agricultural intensification, posed significant environmental and social risks, including groundwater pollution caused by the increased use of pesticides and fertilizers. Therefore, the project conducted a comprehensive Strategic Environmental and Social Assessment (SESA) report and an Environmental and Social Management Plan (ESMP) to address these concerns. These measures were implemented to guide the project's implementation, outlining steps to avoid, minimize, and mitigate any identified environmental and social risks. The Project aimed to ensure responsible and sustainable environmental practices by taking these measures.

The Project successfully integrated the Environmental Project Brief (EPB) into the irrigation system and farming operations. This entailed a comprehensive and objective assessment and evaluation of the potential environmental impacts that could arise from the project's implementation. The EPB further proposed appropriate mitigation and enhancement

measures to counteract any potential negative impacts derived from the project's development.

One of the evident downsides of the Project was the delayed involvement of an Environmental and Safeguard Expert. Despite being outside the PIU's scope, this position was deemed critical due to its extensive duration, prevalent non-compliance, and categorization as a medium-risk E&S project. Consequently, the bank resolved that the PIU must enlist an expert to oversee the remaining project period. In addition, it was found that the Project lacks a formal Grievances Redress Mechanism (GRM) to address and manage any concerns regarding the Project's E&S performance in adherence to the bank's regulations. The absence of a GRM presented a risk to the Project and its beneficiaries.

- Procurement

The Project placed a strong emphasis on strict adherence to rigorous government procurement regulations throughout its implementation. The Project's steadfast commitment to following established protocols facilitated the execution of the project with utmost diligence and professionalism.

The project implementation and results were impacted by procurement issues, particularly in contract management and late procurement of service providers. Unfortunately, two contracts were terminated due to the inability of contractors to deliver according to the contractual requirements. Some contracts surpassed their defects liability period and automatically lapsed. These difficulties resulted in delay in the project's execution and had a negative effect on the overall outcomes achieved.

- Quality of Monitoring and Evaluation (M&E)

The Project Results-Based Logical Framework (project matrix) was designed with precision, ensuring that the indicators were easily quantifiable and directly connected to both district and community levels. However, upon reviewing the M&E plan submitted to the Consultant, it was observed that the plan exclusively focused on data collection tools for irrigation and aquaculture components, with other forms of data not being considered in the plan. Also, the project's progress reporting was inconsistent, despite having a schedule of routine reporting in the M&E plan. For instance, in 2021, only one progress report was issued, and this posed a significant challenge to the Project. Furthermore, the validity of the data was called into question since the database submitted lacked a consistent flow, and results outputs like training among beneficiaries could not be verified to The Excel matrix does not show how the total beneficiaries were calculated casting doubt on the validity of some numbers captured in the progress reports.provide tangible results as presented in the project matrix.

7.0 CHALLENGES

The following section sheds light on the major obstacles faced during the implementation process and their impact on the project's operations. Although this is not an all-encompassing list, the challenges highlighted here are the most significant ones identified throughout the project's duration. It is important to note that the numbers assigned to each challenge are sequential and do not imply any hierarchy of importance.

7.1 Project Level

- Overambitious Project Design: During the implementation of several Project components, unanticipated challenges were encountered while trying to meet certain targets. The underlying cause of these challenges can be attributed to an overly ambitious project design that surpassed the available resources, expertise, and time constraints. The project was initiated during the Ministry's integration with agriculture and livestock, which resulted in a sharp increase in operational demand and a strain on the budget. As a result, unattainable targets were established that proved to be difficult to accomplish within the designated timeframe and available finance. This also resulted in the project undergoing multiple modifications for key infrastructures like irrigation systems, which caused delay in the implementation schedule and budget. The project design required adjustments, leading to cost variations and time overrun. As a result, the small-scale irrigation schemes were reduced from 10 to 1, and the plans for Agro-market Centers and Roadside Markets were discontinued. To ensure successful implementation, the remaining irrigation schemes adopted the TAAT model, among other modifications.

- Lengthy procurement procedures**.** Procurement procedures proved to be a major obstacle in the project's implementation, as they were lengthy and had to be followed to the letter. This caused delays in the acquisition of goods and services, hindering progress. For instance, engaging the Consultant to implement engineering and market structure designs was delayed due to the procurement process.Also, the delivery of feed preceded that of fingerlings, which was problematic since feed has a limited shelf life and expired before fingerlings were delivered. Therefore, having both supplies delivered simultaneously would have been more efficient to ensure optimal conditions for the fingerlings.

- Inadequate contract management: Due to inadequate contract management, some suppliers did not fulfil their contractual obligations, resulting in improper installation of value-addition equipment. Unfortunately, the beneficiaries were not provided with sufficient training on the equipment as the defect liability period had already expired when they were gathered for the training. Consequently, this led to faulty installation of the equipment, causing some beneficiaries to miss out on the training completely. For instance, certain equipment, such as oil expellers, was delivered to the designated location in Lusaka, as specified in the contract, instead of the intended site in the district. Unfortunately, by the time the project's location was finalized, the liability period had already ended, significantly impacting the training process for equipment

usage. Ineffective utilization of the defect liability period poses a substantial obstacle to infrastructure development initiatives. The failure to optimize this period may lead to missed chances to learn from and address defects encountered during operations, which can ultimately compromise the project's value for money. The recent instance of Chitambo Cassava Milling serves as a clear illustration of this obstacle. As operations have yet to commence, the project runs the risk of forfeiting valuable opportunities to rectify defects.

- Covid–19: The Covid-19 pandemic resulted in a significant delay in the execution of various tasks, particularly those that required physical assembly in a single venue which was prohibited by Covid-19 rules and regulations. Training sessions and other undertakings that necessitated physical presence were significantly impacted by this situation.

- Lack of commitment among SMS**:** The Project encountered significant impediments due to a marked lack of commitment among certain subject matter experts. This hurdle was mainly attributed to the specialists' pre-existing obligations, which impeded the efficient implementation of the project activities. This deficiency in dedication unquestionably had adverse implications on the project's overall implementation.

- Inadequate funds to conduct due diligence**.** The Project encountered the challenge of insufficient funds, which hampered the technical committee's ability to perform due diligence on potential suppliers. Consequently, the procurement process heavily relied on supporting documents provided by the suppliers, leading to the involvement of suppliers who caused delays or could not fulfil their obligations during the implementation process. For instance, a local supplier tasked with sourcing of goats could not procure the specific breed required by the Project, resulting in the termination of their contract.

- Lack of Grievances Redress Mechanism**.** The lack of a formal Grievance Redressal Mechanism within the Project posed a potential threat. Without an established procedure in place, stakeholders are left without a means of effectively addressing any grievances or concerns from the inception of the Project.

- Inadequate coordination among the technical team: The Project's framework, which comprised critical components such as livestock nutrition, fisheries, crop diversification, and irrigation, was well-structured. However, there was inadequate coordination among these elements. The lack of cohesive collaboration among the different components led to reduced efficiency, ultimately impacting the project's overall implementation.

7.2 Scheme Level

- Lack of operational funds**:** Managing finances for tractor maintenance has been challenging for the Cooperatives as each was required to maintain an account with a minimum balance of ZMW25,000. The maintenance expenses include diesel, breakdowns, and other related costs. However, despite the operational tractors,

Cooperatives did not have the required minimum balance of ZMW25,000. This created additional financial pressure on the Cooperatives, making it difficult to manage their accounting and money administration effectively.

- Coordination among Cooperative/Scheme Members: Collaborating on projects as a team was a challenging experience due to the lack of full commitment from some group members. This resulted in disparities in effort and output, significantly impacting the overall performance of certain Cooperatives.

- Vandalism of equipment. The project encountered incidents of vandalism and theft due to the failure to move equipment to their designated locations. A notable incident involved the theft of solar dryer panels in the Rufunsa district. This unfortunate event could have been averted had the solar dryer been delivered and installed in its intended location.

- Maintaining full-time employees: Cooperatives and schemes face the challenge of maintaining full-time employees during seasonal fluctuations in activity. This has led to a strain on the finances of the Cooperatives as salaries, and wages must still be paid despite a decrease in work availability. The financial burden has been significant for the Cooperatives/scheme, making it difficult to manage.

- Inadequate training of members of the Cooperatives: Insufficient training among the Cooperative members on the equipment provided by the Project resulted in inadequate utilization of the equipment. Members of the Cooperatives were not trained on how to service the equipment and as a result, the equipment was not used to its full potential, leading to a loss of productivity and revenue.

7.3 General Challenges

- Insufficient cooperation among Cooperative members: Insufficient collaboration among members of the Cooperatives is one of the challenges faced in the Project. Unequal work allocation is a prominent issue, as some members perform more tasks than others. A respondent cited this challenge, highlighting that some individuals are not involved in the day-to-day management of the cages but only participate during sales.

- Inadequate access to the market. Insufficient market access presented a significant challenge for beneficiaries, who are unable to sell their commodities regularly due to lack of access to potential buyers. The members therefore are forced to wait for buyers to come to them , creating room for unfair prices for the Cooperative members. This situation was exemplified by the unfortunate experience of Chipepo Cooperative members, who were defrauded of their hard-earned money.

- Insufficient inputs: Insufficient inputs proved to be a significant obstacle to agricultural production. The inadequacy of vital resources, including seeds, fertilizer, and fish feed, among other essential inputs, hampered the farming process. As a result, Cooperative members were looking forward to the free allocation of these inputs, which had a direct

impact on their planning for the upcoming farming season when the free inputs were not accessible.

- Lack of cold storage facilities. Absence of cold storage facilities significantly contributed to the beneficiaries' inability to access the market. Consequently, they are constrained to sell their harvest immediately, and in the absence of willing buyers, the produce goes waste. Some beneficiaries complained about the exorbitant pricing of the cold storage facility by private owners, which charge ZMW100 per hour, translating to a daily requirement of ZMW 2,400.00 for 24 hours.

- Poor Road Networks. Lack of road infrastructure posed a significant obstacle to the beneficiaries, hindering their ability to obtain inputs and market their produce. A respondent recounted this challenge thus, *"during the transportation of fingerlings, losses occur, resulting in a reduction in the overall number received. While one would typically expect around 18,000 fingerlings, these losses can decrease the final number received to 16 or 15 thousand."*

8.0 LESSONS LEARNT

The deployment of irrigation systems typically involves a phased approach, This section highlights key lessons learned during the Project's implementation. These insights may prove valuable for future stakeholders and decision-makers involved in a similar Project.

- commencing with the uptake of rain-fed farming. In the initial stages of the irrigation sub-component project, efforts were concentrated on setting up modest irrigation systems, eventually progressing to the utilization of land for rain-fed agriculture. Nonetheless, this methodology proved less fruitful than beginning with rain-fed agriculture.

- The uniform application of irrigation practices throughout a field is not a feasible approach. It demands a thorough assessment of the terrain to implement these practices selectively alongside rain-fed agriculture. The undertaking posed a significant challenge and was inadequately overseen, ultimately resulting in unsatisfactory outcomes for the project.

- To achieve a smooth project initiation, it is essential to have comprehensive designs in place for all upcoming projects. This critical step will help streamline the project execution process and ensure successful outcomes. Therefore, in future, the Bank should strongly recommended integrating detailed designs as an integral part of the project planning process.

- The implementation of Cooperatives as a viable business channel was met with challenges due to the insufficient institutional capacity of many Cooperatives. To overcome this predicament, it is imperative to reassess the utilization of Cooperatives and introduce strategic measures to bolster their capacities. Through these measures, Cooperatives can efficiently engage in various project plans, paving the way for greater success and sustainability.

- Ensuring due diligence and acquiring references from previous clients are of utmost importance when selecting optimal service providers. A recent case involving the procurement of goats and fish cages highlights the risks associated with hiring service providers lacking the requisite capacity to fulfil their obligations. Therefore, conducting a thorough due diligence process will be critical to avoid potential pitfalls in future projects.

- To achieve optimum results in the training of beneficiaries, the incorporation of a nurturing stage will be important, whereby technical and business skills support are provided throughout the entire production and marketing chain. Such can be facilitated by established agencies, which can offer holistic assistance to ensure the success of the beneficiaries. By adopting such an approach, the beneficiaries are not only equipped with essential skills, but also acquire valuable knowledge and experience that can aid their future growth.

9.0 CONCLUSION AND RECOMMENDATIONS

This section presents the evaluation's conclusion along with recommendations for future projects. It is pertinent to mention that the recommendations are numbered sequentially and do not imply a hierarchy of importance.

9.1 Conclusion

The Project's objective to contribute to economic growth and poverty reduction by ensuring food, income, and nutrition security was well-aligned with Zambia's national development plans and policies, AfDB Country Strategy for Zambia, and the SDGs. The Project's three Components, namely Agricultural Production and Productivity, Value Chain Development and Market Linkages, and Institutional Strengthening, effectively met the needs of the beneficiaries and were harmonized with existing efforts and structures. The stakeholder assessment revealed a satisfactory rating for the Project's development objective and design. Overall, the project was successful in fulfilling its objectives and contributing to the economic development of Zambia.

While the Project's effectiveness was rated as satisfactory by stakeholders, there were some minor shortcomings identified in the assessment. Some implementation challenges caused delays, and coordination and management issues hindered the achievement of desired outcomes. However, these issues were not significant enough to impact the overall satisfactory rating. On the other hand, the project's efficiency received an unsatisfactory rating, indicating that certain objectives were not met, particularly around processing of critical resources. The stakeholders have identified the lengthy procurement process as impractical, leading to this rating.

Overall, the Project has demonstrated some positive impact on the intended and unintended beneficiaries. However, it is important to note that certain components of the project have only served as triggers for potential impact, which can only be fully realized with further implementation following the Project design. As such, it is recommended that the MoA and MFL continue to monitor and evaluate the outcomes of the interventions, to ensure that its intended impact is realized.

9.2 Recommendations

- To ensure a more streamlined and focused Project design, it is recommended that interventions of a similar nature be structured to narrow their focus to a single sector. Attempting to address multiple sectors in a single project may lead to an overambitious design and ultimately compromise the Project's success. It is strongly advised that Projects be approached with careful consideration and deliberate planning to ensure the best possible outcome.

- Cooperatives are valuable delivery channels for businesses but may not be the best fit for running enterprises. Instead, supporting individual farmers and entrepreneurs through accessible loan programs would be more effective for similar initiatives. By investing in such loan programs, committed farmers can apply for funding and acquire

essential resources such as tractors, irrigation equipment, fence materials, and animals. Operating as independent business owners rather than Cooperatives or Organizations allows farmers to achieve greater autonomy and success. Thus, investing in individual farmers through accessible loan programs can pave the way for a thriving agricultural community.

- The current model of engaging SMSs warrants re-evaluation, and it is highly recommended that the future Project engages full-time specialists while utilizing government personnel in an advisory capacity.

- To ensure the seamless integration of various components, it is imperative to intensify technical review meetings among stakeholders. This will help identify and address any potential issues or conflicts, ultimately resulting in a more efficient and effective collaboration among the teams involved.

- To guarantee the procurement team's successful engagement with competent suppliers, allocating adequate funding for conducting due diligence will be paramount. This diligent process will enable the team to verify the potential supplier's capabilities and ensure they are well-equipped to perform the task.

- The MFL should consider intensifying the training on aquaculture development among female and youth beneficiaries. This is particularly essential as the findings have reported low participation regarding training. Therefore, the Ministry must prioritize this issue to ensure that female and youth beneficiaries are adequately equipped with the skills and knowledge necessary to participate in the aquaculture industry.

- The MoA and MFL should strengthen their monitoring strategies to identify potential risks that might jeopardize the success of those interventions. It will be important that proactive measures are taken to ensure that any potential threats are detected and addressed in a timely and effective manner. This will not only safeguard the welfare of the beneficiaries of these interventions but also enhance accountability and transparency in the delivery of agricultural and fisheries services.

- To enhance market linkages within the aquaculture industry, the MFL should consider the establishment of cold storage facilities, which would be managed by a committee with the assistance of GRZ officials. This strategic move will promote improved coordination and collaboration amongst stakeholders, leading to enhanced operational effectiveness and ultimately, increased profitability.

- The MoA must prioritize the timely rectification of defects on certain schemes. One such case is the Shikabeta Irrigation Scheme where electrification of the scheme is still pending. This delay in electrification has caused a lot of inconveniences and hindered progress.

10.0 ANNEX

10.1 Indicator Matrix Review

Indicator	Indicator Measure	Target Year	Target Value	Actual Year	Actual Value
Average Crop Yield - Maize	Ton/Ha	2014	2.4	2023	3.6
Average Crop Yield - Cassava	Ton/Ha	2014	10.0	2023	12.0
Average Livestock Offtake per year - Goats	Number	2014	3900.0	2023	3200.0
Average Livestock Offtake per year - Poultry	Number	2014	250000.0	2023	260000.0
Percentage of primary products processed locally by women and men	%	2014	30.0	2023	20.0
Value of processed products by women and men	ZMW	2014	2000.0	2023	2000.0
Number of beneficiaries (farmers)	Number	2014	14565.0	2023	11,360
Number of beneficiaries (farmers) - of which women	Number	2014	6554.0	2023	4454.0
Number of scheme management entities	Number	2014	10.0	2023	10
Number of fish pens	Number	2014	280.0	2023	280
Number of fish cages	Number	2014	340.0	2023	170
Fish production	Ton/Year	2014	400.0	2023	117.54
Number of livestock pass-on scheme women groups	Number	2014	48.0	2023	60
Number of poultry-keeping groups	Number	2014	120.0	2023	65
Area under conservation agriculture	Ha	2014	32730.0	2023	40,548.2
Area under mechanised agriculture	Ha	2014	69000.0	2023	34,390
Number of maize mills	Number	2014	2.0	2023	0
Number of cassava mills	Number	2014	2.0	2023	1

Indicator	Indicator Measure	Target Year	Target Value	Actual Year	Actual Value
Number of community level processing equipment - honey presses	Number	2014	40.0	2023	40
Percentage of reduction in cassava losses	%	2014	2.0	2023	3%
Number of roadside markets	Number	2014	327.0	2023	0
Number of Agro-dealers supported	Number	2014	60.0	2023	0
Number of households trained in nutrition activities - male headed	Number	2014	1210.0	2023	7,658
Number of households trained in nutrition activities – female-headed	Number	2014	550.0	2023	653
Number of infants fed	Number	2014	1600.0	2023	1,600
Rural population trained/recruited/using improved technology	Number	2014	1210.0	2023	1089.0
Rural population trained/recruited/using improved technology - of which women	Number	2014	550.0	2023	500.0
Project Technical Team supported	None	2014	Project Implementation Unit (PIU) set up	2023	Project Implementation Unit (PIU) set up
M&E system established	None	2014	M&E system functional	2023	M&E system partly functional
Feeder roads constructed or rehabilitated	Km	2014	50.0	2023	0.0
Average h/hold income	$/Year	2014	1600.0	2023	1512.0
Average period of h/hold food scarcity	Month/Year	2014	3.0	2023	3.0
Malnutrition (stunting) in under-5 children	%	2014	30.0	2023	32.0
Primary products processed locally by women & men	%	2014	16.0	2023	16.0
Scheme area under irrigation	Ha	2014	3337.0	2023	3,344

Indicator	Indicator Measure	Target Year	Target Value	Actual Year	Actual Value
Seed supplied	Ton	2014	13500.0	2023	149,134
Number of community-level processing equipment - solar dryers	Number	2014	70.0	2023	70
Agriculture service centres	Number	2014	6.0	2023	0
Number of farmers trained, based on needs assessment	Number	20	16800.0	2023	22, 549

10.2 Success Stories

Modern Farming Technologies Boost Farmer's Yield: Mr Philip Miselo Credits APMEP Equipment for His Success in Agriculture

Mr Philip Miselo, a seasoned farmer at the age of 41, has gained significant strides in his farming activities through the adoption of modern farming technologies. Such technologies have enabled him to increase his yield with ease and attain a profitable business. He acknowledges APMEP equipment's immense contribution to his success in agriculture. Mr Miselo has embraced the use of a tractor from APMEP in his farming activities. In the 2022/2023 farming season, he paid ZMW2400 for fuel to operate the tractor on an 8ha piece of land. Despite reducing his cultivated acreage in the 2022/2023 farming season, Mr Miselo is optimistic about harvesting 80 to 90 bags x 50kg of soya beans on 5 ha and 60 to 70 bags x 50kg of maize on 3 ha. Notably, he indicates that he would have recorded better results had he not planted maize late.

Mr. Philip Miselo, a dedicated farmer, stands confidently beside his reliable APMEP tractor - a key tool in his successful farming operations.

The previous farming season was quite successful for Mr Miselo as he managed to harvest 695 x 50kgs bags of maize on 9ha and 82 x 50kg bags of soya beans on 3ha. As an experienced farmer, Mr Miselo understands that time is money and, therefore, opted to sell all his soya beans to FRA and some bags of maize to briefcase buyers and FRA. This decision earned him a total of ZMW133,000.00, with ZMW51,000.00 coming from the sale of maize and ZMW82,000.00 from the sale of soybeans.

It is noteworthy that Mr Miselo has had to skip cultivating some hectares of his farm due to sharing the tractor with other farmers. He attributes his success in farming to the use of modern technologies as exemplified by the adoption of APMEP equipment in his farming activities.

It is evident that Mr Miselo's dedication to embracing modern farming technologies has paid off significantly. His story is a beacon of hope for farmers who may be struggling to make ends meet. Through his example, Mr Miselo has proven that it is possible to achieve a profitable business through the adoption of modern farming technologies.

Rice Seed Grower Defies Age Stereotypes: 63-Year-Old Proves It's Never Too Late to Learn and Succeed in Agriculture

Mr Chesha Kunda, a seasoned 63-year-old rice seed grower, has come a long way since his first encounter with rice cultivation. It was back in 2016 when he participated in a demonstration field set up by the APMEP in the Luombwa cluster, located in the Chitambo district. The purpose of the demonstration was to inspire and encourage people to start rice production, and it was a huge success. Many locals were motivated to join in, and Mr Kunda was one of them. As a result of his participation in the demonstration, Mr Kunda witnessed firsthand the numerous benefits of rice cultivation. He saw its potential to positively impact his livelihood and those of his fellow farmers. Seeing such a positive effect motivated him to invest more of his time and resources into rice growing.

Meet Mr Chesha Kunda, an expert rice seed grower, tending to his field with precision and care."

Over time, other organizations such as the Japan International Cooperation Agency (JICA) and the Seed Control and Certification Institute (SCCI) were impressed by the success of the APMEP program and offered training programs to local farmers. Mr Kunda was one of the many participants who took advantage of this opportunity and attended the training courses in 2022. Through the SCCI training, Mr Kunda was able to produce an impressive 12.5 kg of seed.

One of the many advantages of becoming a seed grower was the added value it brings compared to producing commercial rice grains. With a 50kg bag of rice seeds, one can plant a whole hectare of land, which generates more profit in the long run. Additionally, selling a 50kg bag of rice seeds is equivalent to ZMW 1000, much higher than the average price of ZMW 200 to 300 per commercial rice grain bag.

"One advantage of being a seed grower is the substantial financial gain that comes with producing seeds".

Chesha Kunda

For Mr Kunda, the journey to becoming a successful rice seed grower has been challenging but fulfilling. His dedication and hard work have paid off, not only for himself but also for his community. Through his success, he has become an inspiration to others who wish to follow in his footsteps.

Livestock Service Centre Brings Hope and Security to Farmers: One Beneficiary's Testimony

Edward Mwilye, a 39-year-old farmer, hails from the Serenje district. He is one of the beneficiaries of the livestock service centre at Chibobo Cooperative. Mr Mwilye recalls a time when he lost 6 cattle due to poor animal health management leaving Mr Mwilye disheartened and concerned for the remaining livestock. However, he expresses immense gratitude towards the livestock service centre for their assistance. The centre has made a significant difference in his livelihood by greatly improving the health of his animals. Mr Mwilye's cattle are now in good health, a fact he attributes to the establishment and operation of the livestock service centre.

> ***"Initially, my livestock appeared to be in poor condition and not thriving. If the facilities had commenced functioning earlier, I would have suffered losses.".***
>
> **Edward Mwilye**

A sense of relief fills Edward Mwilye's heart as his cattle thrive under improved health conditions.

With heartfelt regret, Mr Mwilye muses that if the centres had been operating much earlier, he would not have lost any of his valuable cattle. It is evident that the establishment of the livestock service centre has brought about a sense of hope and security in Mr Mwilye's farming endeavours.

The story of Mr Mwilye serves as a poignant reminder of how crucial these agricultural support systems are in uplifting farmers' livelihoods. The government's continued investment in such institutions is of great importance, especially for small-scale farmers like Mr Mwilye, who depend solely on their livestock for income.

10.4 Data Collection Tools

10.5 Terms of Reference