



Final Project Evaluation Report For

Enhanced climate change adaptation for improved agricultural production for 1090 farmers in Tharaka North and South by end of December, 2023

IAS KENYA

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This report was prepared by Prof. Levi Musalia, an animal scientist and climate change consultant, who led the evaluation team consisting of Prof. Mary Karuri a social Scientist, Dr. Marciano Mutiga, an ecologist and Mr. Kennedy Mutugi, a water resource management specialist all from Tharaka University. I sincerely convey my appreciation to this team for their inputs that saw this exercise take shape. The team worked under the overall guidance of Bernard Omondi, the acting Programme Manager IAS K and Mr. Absalom Edewa the Project Officer. IAS K, who I thank for their assistance and availing the required information.

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EXCECUTIVE SUMMARY

The project evaluation was carried out to gather essential data for the project's transition to the next phase and pinpoint key areas for advancing climate change adaptation in Tharaka North and South Sub-Counties. The study was limited to five villages; Chiakariga and Kamanyaki in Tharaka South Sub County and Maragwa, Kathanganchini and Kanjoro in Tharaka North Sub County. A survey was conducted through questionnaires, focus group discussions, key informant interviews as well as desk research to generate information on effectiveness, constrains and challenges in implementing the project.

In terms of relevance of the project, it addressed knowledge gaps in the areas of poor agricultural practices, access to knowledge and information and water harvesting and conservation which are key in building resilience of climate change scenarios of unreliable rainfall, prolonged droughts and limited information on climate change in the area. The project was found also to conform with both the National government development blue print, the Vision 2030 and the County government of Tharaka Nithi County integrated development plan (CIDP) 2018 – 2022. Specifically, the potential of natural resources located within Arid and semi-Arid lands (ASALs) were recognized in the project. The County government of Tharaka Nithi in its blue print strategizes on the development of the agricultural sector prompting a technical strategic focus, including conservation agriculture and water harvesting as well as improved production through better-adapted seeds and breeds, pests and disease control, and capacity building.

The Project involved stakeholders through a participatory approach by organized meetings and forums, FGDs and consultations that was employed right from design of the project with community taking lead. According to the Project implementers, the responses of farmers were positive with adequate cooperation, support and effective participation in project activities. They even recommended for an extension of the project to create more impact. The project targeted 27 activities, to achieve its outcomes, of which 22 were implemented whereas, five are currently on going after sourcing through the procurement process.

Almost all respondents (94.4%) benefitted from the project by trainings on modern agricultural practices, water harvesting & conservation and accessing information on early warning systems for improving livelihoods. In this project more effort was directed towards building capacity of farmers, however they did not have access to capital to implement the practices learnt. Lack of inputs, more so planting materials, featured prominently as a major challenge. However, it

is also worth noting that despite the number of trainings, capacity building was still mentioned as a major intervention for the success of the project.

Inadequate rainfall and water continued to feature as obstacles hindering the implementation of new farming methods by farmers. The farmers preferred earthen dams, plastic tanks and water pans in that order. However, it was noted that water harvesting and conservation was costly both in terms of tools and machinery involved.

The farmers had been advised on where to retrieve information; extension officers, google, partners like Tegemeo, Farm Africa, Government departments, Academia- University, Tharaka Technical, KeWI etc.

Regarding the general impact of the project, there was enhanced crop and livestock feeds production and water conservation practices but due to the short duration of the project, the impact of the project on livelihoods could not be measured.

The project did well in applying vertical integration by bringing on board different stakeholders including; farmers, service providers, academia and top government decision makers to work together for the success of the project. However, providers of inputs need to be strongly represented in this working group.

From the findings, it was concluded that the project addressed knowledge gaps in the areas of poor agricultural practices, access to knowledge and information and water harvesting and conservation which are key in building resilience on climate change scenarios of unreliable rainfall, prolonged droughts and limited information on climate change in the project area. It was recommended that IAS K to consider starting a long-term project within Tharaka North and South on climate change adaptation program. This project should engage the local communities giving space to the identified challenges and recommendations mentioned in this report. It was also recommended that IAS K implement the project in partnership with County Government of Tharaka Nithi and have the project entrenched in the county integrated development plan for purposes of upscaling and sustainability.

TABLE OF CONTENTS

ACKNOWLEDGEMENT	i
EXCECUTIVE SUMMARY	ii
LIST OF TABLES	vi
LIST OF FIGURES	vii
ABBREVIATIONS/ACRONYMS	viii
1.0 INTRODUCTION	1
1.1 Vision	1
1.2 Mission.....	1
1.3 Background, Context and Description of the Project.....	1
1.4 Project Stakeholders.....	2
1.5 Purpose and Objectives of the final evaluation.....	3
1.5.1 Purpose of Evaluation.....	3
1.5.2 Specific objectives of Evaluation	4
1.5.3 Evaluation Research questions	4
1.5.4 Evaluation Scope	5
2.0 METHODOLOGY	6
2.1 Desk Review	6
2.2 Design.....	6
2.3 Data Collection.....	6
2.3.1 Focus Group Discussions	6
2.3.2 Key Informant Interviews.....	7
2.3.3 Project Coordinator Interview	7
2.3.4 Data Analysis Procedures	8
2.3.4.3 Observation and life stories	8
3.0 FINDINGS.....	9
3.1 Relevance of the Project.....	9
3.2 Effectiveness	9
3.2.1 Implementation of Project Activities	10
3.3 Beneficiaries Biodata	15
3.4 Project awareness	16
3.5 Benefits of the project	17
3.6 Access to information and Data on Early Warning	18
3.7 Improved agricultural production.....	20

3.8 Water harvesting and conservation.....	24
3.9 General impact of the project.....	28
3.10 Strengthening vertical integration.....	29
3.11 Sustainability.....	31
3.12 Gender/Youth.....	32
4.0 CONCLUSION AND RECOMMENDATIONS.....	33
4.1. Conclusion.....	33
4.2 Recommendations.....	34
APPENDICES.....	36

LIST OF TABLES

Table 1:Activities implemented in Tharaka North and South Sub Counties by the project	10
Table 2. Activities that were not implemented indicating the reasons/ or actions that is to be taken.....	15
Table 3. The Benefits of the IAS-K project on respondents	17
Table 4. Frequencies and percentages of main source of information on climate change and farming.....	19
Table 5. Frequencies and percentages on new farming methods introduced by IAS-K	20
Table 6. Frequencies of challenges in implementing new farming practices	22
Table 7. Participation in livestock feeds production	23
Table 8. Frequencies of challenges in fodder crop production and conservation	23
Table 9 Frequencies of proposed interventions by respondents to help improve farm yields .	24
Table 10 Water harvesting and conversation	24
Table 11. Structures or equipment used for water harvesting and conservation.....	25
Table 12. Challenges not addressed by IAS K.....	26
Table 13. Structures or equipment preferred by community for water harvesting and conservation	27
Table 14 Percentages of the general impact of IASK project on the community	29
Table 15. Grants offered to Postgraduate Students	30

LIST OF FIGURES

Figure 1. The percentage of respondents that benefited from the project according to the different villages under study	18
Figure 2. The percentage number of information sharing trainings each village received during the study.....	19
Figure 3. Pie chart represents the main challenges in accessing information.....	20
Figure 4: Use of Zai pits at Maragwa village.....	21
Figure 5: earths Dam at Maragwa.....	26

ABBREVIATIONS/ACRONYMS

ASAL	Arid and Semi-Arid Lands
CBOs	Community Based Organizations
CCAM	Climate Change Adaptation Modalities
CIDP	County Integrated Development Plan
CISU	Civil Society in Development
COVID-19	Corona Virus Disease of 2019
FGD	Focal Group Discussion
IAS K	International Aid Services Kenya
KALRO	Kenya Agricultural and Livestock Research Organization
KASCAP	Kenya Arid & Semi-arid Climate Adaptation Programme
KES	Kenya Shillings
LFA	Logical Framework Analysis
M&E	Monitoring & Evaluation
NAP	National Adaptation Plan
NDMA	National Drought Management Authority
NGO	Non-Governmental Organization
RIDEP	Rural Initiative Development Programme
SAPAD	Strategies for Agro-Pastoral Development
SHGs	Self Help Groups
SPSS	Statistical Package for the Social Sciences
ToT	Trainers of Trainers
ToR	Terms of Reference
TVET	Technical & Vocational Education & Training

1.0 INTRODUCTION

IAS K is a Non - Governmental Organization registered under the NGO Coordination Board in Kenya. The organization was re-registered as a local/national NGO in 2017 as an independent and autonomous with a local governing board.

1.1 Vision

"A World where Communities are empowered to Live Dignified Lives"

1.2 Mission

"We seek to empower communities through the promotion of access to education, sustainable livelihood, environmental stewardship, and human rights."

The aim is to empower the communities of Tharaka to adopt adaptive practices and enable IAS K to establish a long-term partnership with the government, academia, private sector, civil society and local communities on Climate Change Adaption. This project not only aims to increase the self-sufficiency and food security of farmers, but also serves as a piloting and capacity-building exercise for IAS K and its partners to play a vital role in future climate change adaptation efforts.

1.3 Background, Context and Description of the Project

IAS K has been working to integrate resilience in their development work since 2006 and is now building on the gains made and lessons learnt while incorporating available research findings and ensuring efforts complement existing government plans. The above project is in line with the Government of Kenya ASALs National Vision and Strategy: Vision 2030 Development for Northern Kenya and other Arid Lands. This project targeted farmers, agro-pastoralists, youth and women, different government ministries, students and tutors in higher learning institutions, CBOs/SHGs, local leaders and members of the community. The target group were therefore composed of mostly peasant farmers and vulnerable households surviving from hand-to-mouth and living on less than 1.90 dollars a day. They are mixed farmers practicing both crop and livestock production. The target groups had previously been implementing resilience focused interventions. However, this project sorted to fill in gaps that were identified through interaction and discussions with the communities. The purpose of this

intervention was to address the consequences of climate change in Tharaka and facilitate a process by which sustained adaptation policy and plans are prepared for the future. IAS K implemented disaster risk reduction, resilience programming and innovation through climate change adaptation approach together with vertical integration. In this short-term intervention, which served as pilot for a larger intervention sort to introduce drought tolerant seeds to replace previously failing seeds to enhance a sustainable value chain of seed selection, conservation, and propagation. Other result areas of focus were: a) Awareness creation on climate change and understanding of agronomic practices (crop rotations, intercropping, agroforestry, cover crops, and no-tillage) for propagating drought tolerant crops. b) Promotion of fodder to sustain livestock during the drought season and as an alternative for crop production. c) More knowledgeable water committee members d) Availability of resource people in the community to assist with water harvesting technologies. e) Increased volume of water retained to be used during the drought period. f) Partnerships for stronger climate adaptation and resilience building. g) Introduction of sustainable financial mechanisms for haymaking, liners, seed acquisition, and fodder production 6 The intervention focused on Agriculture as the main sector/theme in addressing climate adaptation and water supply as a sub-sector.

1.4 Project Stakeholders

The following were identified as the stakeholders of the project

- Farmers through Self Help Groups and Cooperative Associations
- GOK- Min of Agriculture & Livestock, Water Department, Kenya Forest Services, Min of Interior (especially sub-county levels and local administration), Environment Department
- National Drought Management Authority
- Community Based Organisations- Tumaini CBO, Tharaka Inventions Circle CBO, Tharaka Children & Women CBO, Tharaka Green Gold CBO, RIDEP CBO, SAPAD CBO
- Faith Based Organizations- Churches
- Academia- Tharaka University, Kenya Water Institute- Chiakariga, Tharaka Technical and Vocational College
- Private Sector- Tegemeo Cereals Ltd
- Tharaka County Steering Group
- NGOs- Plan International, WHY Kenya, Farm Africa

Roles played by Stakeholders

- Facilitating trainings to farmers
- Joint reporting forums e.g. CSG and NDMA
- Policy influencing and reinforcement
- Supporting in research and innovations- e.g. Tharaka University, Tharaka Technical
- Community mobilization and information dissemination
- Provision of security during project implementation
- Implementation of project activities
- Field monitoring

1.5 Purpose and Objectives of the final evaluation

The primary aim of this end of project evaluation is to gather essential data for the project's transition to the next phase and pinpoint key areas for advancing climate change adaptation in Tharaka North and South Sub-Counties. The evaluation outcomes will play a crucial role in elucidating the actual challenges, achievements, and lessons learned from the pilot project, providing valuable insights for the subsequent phase. A comprehensive end of project evaluation will highlight the impact of climate change, identify the most marginalized and vulnerable groups, and illustrate shifts in weather patterns affecting the communities. Employing a recall methodology covering the past five years will present the status, offering insights into the tendencies experienced by the target group regarding the consequences of climate change. This data will be disseminated to government departments, research institutions such as Tharaka Nithi University, Civil Society Organizations (CSOs), and local media.

1.5.1 Purpose of Evaluation

- i. To assess and bring out the outcome for the project in relation to climate change adaptation during the implementation period. Avail qualitative and quantitative data and information from the implemented activities focusing on both the primary and secondary beneficiaries.
- ii. Give recommendations to appropriate water resourcing methodologies for the area in relation to Climate Change Adaptation
- iii. Give recommendations for strengthening of vertical integration as per CISU definition to private sector, local government, civil society and academia

- iv. Give other recommendations for a new programme to be submitted to CISU CCAM February 2024.

1.5.2 Specific objectives of Evaluation

1. Enhance comprehension of the constraints and challenges encountered by target participants, along with an assessment of their current needs.
2. Establish benchmarks for outcome-level indicators that will serve as a basis for evaluating the program's future impact.
3. Strengthen program monitoring by extracting valuable lessons from the evaluation process and utilizing baseline information for assessment.
4. Explore opportunities for potential future projects within the realm of Climate Change Adaptation Modalities, with a specific focus on water harvesting, hereunder a focus on what types of water harvesting/water sources are best for the geology of the project area.
5. Give recommendations for strengthening of vertical integration as per CISU's definition with the private sector, local government, civil society and academia
6. Give other recommendations for a new programme to be submitted to CISU CCAM February 2024.
7. Give recommendations for how to make the program more youth friendly

1.5.3 Evaluation Research questions

Specifically, the evaluation was designed to answer key questions on the process of implementation, outcomes, impact and sustainability of the project:

1.5.3.1 Process Related Questions

1. How do stakeholders understand climate change?
2. What are the objectives of the project? How were they identified? Were they easily achieved?
3. What are the activities of the project?
4. What were the outcomes that stakeholders identified? How were they identified?
5. Is the project relevant to the national development agenda
6. How was the project implementation monitored?

1.5.3.2 Outcome Related Questions

1. How has the Project improved the farmers knowledge in crop production, water conservation and information sharing?
2. Farmers trained?
3. How many have been taken up? Why or why not?

4. What has changed, when and how in terms of participation?
5. What is the most significant change as a result of the project?
6. Are the changes sustainable?

1.5.3.3 Impact Related Questions

1. How has it improved the livelihoods of the community? What have been the challenges?
2. What are the success stories?
3. What has been learned from the pilot project?
4. what can be improved

1.5.3.4 Gender/Youth Related Questions

1. What were youth/women related issues of the highest priority?
2. How can the stakeholders be prepared to handle the issues?

1.5.4 Evaluation Scope

The final evaluation study was limited to the following villages: Chiakariga, Maragwa, Kanjoro, Kathangacini, and Kamanyaki of Tharaka North and Tharaka South Sub-Counties, of Tharaka Nithi County. The exercise engaged relevant project stakeholders and ensured that the views and perspectives inform the evidence and learning that was generated. The scope of the content of the assignment was derived from the activities and indicators for the project objectives outlined in the M&E framework.

2.0 METHODOLOGY

2.1 Desk Review

The initial phase involved a comprehensive content review to understand the available climate change information. A desk review was conducted to triangulate information, identify deliverables, and set parameters for the final evaluation. This entails reviewing project documents, past reports, and relevant secondary data, both accessible online and otherwise. Draw on experience and best practises of likeminded organisations for improving climate change adaption in ASAL regions and bring to attention of potential new elements.

2.2 Design

A survey design was used for this evaluation to allow both a broad and in-depth range of stakeholder views to be captured. This consisted of face-to-face interviews with farmers in five villages namely, Chiakariga, Maragwa, Kanjoro, Kathangacini, and Kamanyaki of Tharaka North and Tharaka South Sub-Counties, of Tharaka Nithi County. The project coordinator and local Government staff in the ministries of Agriculture and Environment (CEOs and county directors), were also interviewed. Both qualitative and quantitative data were captured with the later to provide evidence about project activities and outcomes. Ten key informants (2 from each location) were selected from villages and interviewed at the IAS K office.

2.3 Data Collection

The survey part of the evaluation was conducted through face-to-face interviews, by enumerators, using a structured interview questionnaire to collect information from farmers of the project. This survey captured beneficiaries' views for establishing impact indicators as reflected in the project documents and M&E framework. Twenty-one farmers were selected randomly under the guidance of a key farmer from each location, giving a total of 105 farmers (10%, of the targeted farmers)

2.3.1 Focus Group Discussions

The Focus Group Discussion (FGD) was used to generate information on effectiveness, constrains and challenges in implementing the project. Data on knowledge and learning climate change adaptation and optimized integration, coordination and alignment was also obtained from the FGD. A guided open discussion was used to provoke answers from respondents.

The following thematic areas were focused in the discussion in order to generate the required data:

1. Knowledge /awareness of climate change
2. Effect of climate change on agriculture.
3. Support offered by IAS-K in adopting to climate change challenges/drought.
4. Specific indicators or outcomes used to gauge success
5. Achievement of knowledge on farmers' way of crop production and water conservation
6. Engagement in information sharing activities
7. Challenges faced by farmers despite the support received.
8. Collaboration between the community, county government, and non-governmental organizations in addressing climate change challenges.
9. Areas of improvements to enhance collaborations.
10. Any youth/women related issues of the highest priority and how to prepare the stakeholders to handle the issues?

2.3.2 Key Informant Interviews

Heads of departments in the various government departments viz: water and agricultural departments and KASCAP were interviewed using the following guidelines: -

1. Approach and any policies on building resilience on climate change
2. Water- harvesting technology
3. Community level water harvesting
4. Effectiveness and challenges of water harvesting methods
5. Future concerns & planning
6. Policy recommendations

2.3.3 Project Coordinator Interview

The project coordinator was given guided interview questions to respond to. The interviews explored stakeholders' views and experiences of the implementation of the Project, the changes the project has brought, their identified outcomes and any evidence of these, and suggested improvements for the project. The interview guide is attached (Appendix C).

2.3.4 Data Analysis Procedures

Procedures for quantitative and qualitative data analysis were applied.

2.3.4.1 Quantitative Data Analysis Approaches

Numerical data was first coded and keyed in the SPSS spreadsheets version 25 to generate frequency data sheet output. Based on each variable under scrutiny in line with the research questions, data were presented in pie charts, tables and bar graphs in order to clearly illustrate the study findings.

2.3.4.2 Qualitative Data Analysis Procedures

Descriptive data and information recorded were carefully sorted out and transcribed in thematic issues drawn from the study objectives, key informants and focus group discussion guides. The recorded information was scrutinized thoroughly to capture the main surrounding climate change adaptation issues. The issues generated were then confirmed with the short notes in the questionnaires. Further, the key achievements presented by the respondents during the discussions along the study questions were explored accordingly. The main points of emphasis were captured in verbatim expressions throughout the data analysis and presentation to supplement the numerical values and percentages generated through the SPSS output.

2.3.4.3 Observation and life stories

Successful farmers were identified and selected for observations and recording of life stories.

3.0 FINDINGS

3.1 Relevance of the Project

The project addressed knowledge gaps in the areas of poor agricultural practices, access to knowledge and information and water harvesting and conservation which are key in building resilience of climate change scenarios of unreliable rainfall, prolonged droughts and limited information of climate change in the area. The project is in conformity with both the National government development blue print, the Vision 2030 and the County government of Tharaka Nithi County integrated development plan (CIDP) 2018 – 2022. Vision 2030 is a new development blueprint covering the period 2008-2030 which aims at making Kenya a newly industrialized middle-income country providing high quality life for all citizens by the year 2030. Specifically, the potential of natural resources located within Arid and semi-Arid lands (ASALs) has been recognized. In this regard, the blue print has provided a framework for action for various stakeholders that will lead to sustainable development using the ASAL's natural resource base. Further, Kenya's National adaptation plan 2015 - 2030 (NAP) outlines the Kenyan Government's ambitions for climate adaptation. It has the purpose for shaping a framework for coordinating and mainstreaming adaptation plans from the national to county level within respective development plans and budgets.

The County government of Tharaka Nithi has outlined budget allocation for climate adaptation through the County integrated development plan (CIDP) 2018 - 2022. The CIDP strategizes on the development of the agricultural sector prompting a technical strategic focus, including conservation agriculture and water harvesting as well as improved production through better-adapted seeds and breeds, pests and disease control, and capacity building. The National Drought Management Authority (NDMA), a government department, has identified selected target area and groups as the most underdeveloped locations in Tharaka Nithi County which were used to guide identification of the project area.

3.2 Effectiveness

The Project started with formulation of project objectives which involved stakeholders through a participatory approach by organized meetings and forums, FGDs and consultations that was employed right from design of the project with community taking lead. There were different types of stakeholders in this project who played different roles as listed in 1.4. According to

the Project implementers, the responses of farmers were positive with adequate cooperation, support and effective participation in project activities. They even recommended for an extension of the project to create more impact.

3.2.1 Implementation of Project Activities

The project targeted 27 activities, to achieve its outcomes, of which 22 were implemented (Table 1). This represents 82% of the total activities. The other five activities are currently on going after sourcing through the procurement process (Table 2).

Table 1: Activities implemented in Tharaka North and South Sub Counties by the project

Output 1.1: Increased adoption of drought-tolerant crops by 600 farmers in Tharaka North and South Sub Counties	
Inception meeting	41 stakeholders (30M & 11F) attended the launch of the Climate Change Adaptation Modalities (CCAM) project.
Activity 1.1.2: Identification/Profiling of 20 groups of Farmers and livestock keepers.	The following 21 groups with a total of 506 (213 M & 293 F) members, were identified and sensitized in meetings: Muramba wa Mbogo SHG, Kanjoro Disabled Self Help Group [SHG], Gatumi SHG, and Mwendani Livestock SHG from Kanjoro Location, Ntabuta SHG, KATD SHG, Kathuure Disabled SHG, and Twanathanju Folk Media SHG from Kathangacini Location, Gakea Seed Bankers SHG, Muguna SHG, Kugeria SHG, Mpingiro and Upendo SHG from Maragwa Location, Muchui SHG, Area Managers SHG, Chiakariga Farmers' Cooperative, and Kang'ombe SHG from Chiakariga Location, Mukathe SHG, Tunza Punda SHG, Wendo SHG and Kamanyaki Farmers' Cooperative from Kamanyaki Location.
Activity 1.1.3: Train 100 lead-farmers on appropriate agronomic practices for propagating drought-tolerant crops (who then train remaining group).	The project trained 116 lead farmers (47M & 69F) on appropriate agronomic and livestock production practices.
Activity 1.1.4: Hold 2 forums targeting 400 People on best agronomic practices and permaculture for farmers, youth and women.	The project worked with government officers from the Ministry of Agriculture to sensitize 466 farmers (161M & 305F) on best agronomic practices and permaculture, through organised fora at Chiakariga, Kanjoro, Kathangacini and Maragwa Locations
Activity 1.1.6 Engage a consultant to carry out drought-tolerant seed value-chain assessment.	The project successfully conducted a Seed Value-Chain Assessment, targeting 150 primary respondents, 27 KIIs/ secondary respondents, and 5 FGDs.

Output 1.2-Increased animal production through the adoption of drought tolerant fodder crops and pasture conservation by 600 farmers.

Activity 1.2.2: Establish 4 field learning demonstration plots for selected drought-tolerant seeds/fodder

The project sought the extension services of agricultural officers to establish the 3 demo farms, i.e. Wendo Farm, Ntabuta Farm and IAS K Farm.

Activity 1.2.3: Conduct 5 onsite training for 100 interested and motivated farmers on pasture/forage conservation

The project conducted onsite training for 173 Livestock Farmers (55M & 118F) livestock farmers on pasture/forage conservation.

Output 1.3 Develop and operationalize early warning for early Action communication systems for agricultural purpose

Activity 1.3.1: 2 Capacity-building sessions on early warning for early action to the County Steering Group, Kenya For Resilience (K4R), IAS K staff, and NDMA Field Monitors targeting 80 people.

The project organised for 2 workshops and trained 63 participants (44M & 19F) from government, CSG and CSOs, on climate change and early warning systems for early action

Activity 1.3.2: 2 local media engagements to raise awareness on early warning targeting at least 80% of the target groups and 100% of the indirect target group.

The project hosted a public awareness session on climate change and early warning systems on Weru TV and Radio. Approximately 2,568 people (1233M & 1335F) tuned in live, inclusive of 244 viewers watching via YouTube (see link below). https://www.youtube.com/live/bNVk8DDLs3k?si=uf7TbO_opifxXYP0

The project also engaged a number of media stations including Weru FM, KBC Radio, Mwendantu TV and Mwenge Radio, to feature the climate change training for staff and partners, and activities undertaken by IAS K in Tharaka community.

1. Two staff discussed IAS project activities and the purpose of the training.
2. Similarly, the journalists interviewed two (2) lead farmers in connection with the training and their affiliation with IAS K.
3. The project also hosted 1 lead farmer and 1 Climate change expert at Weru TV/FM to create awareness on Climate Change adaptation and Early Warning Systems

Output 1.4: Increased knowledge on water harvesting and set up rainwater harvesting technologies that withstand climate change for improved agricultural production

Activity 1.4.1: Train 20 ToTs on irrigation technologies and water harvesting

The project trained 20 ToTs (6M & 14F) on integrated water management, water resource allocation and coordination, pollution control, water availability, irrigation technologies and water harvesting methods. The TOTs embarked on training water committees and farmers on water harvesting, cost effective utility, conservation and storage.

Activity 1.4.2: Train group committees on water management targeting 45 people

The project trained group committees on water management 44 people (23M & 21F).

Activity 1.4.3: Lining of 3 water pans and installation of 3-foot pumps to enhance water retention

The project identified 3 farmers with water pans for support with dam liners and water foot pumps. The procurement of the linings and water pumps was in progress.

Output 2.1: Capacity and execution of adaptation plans by IAS Staff

Activity 2.1.1: Link farmers to locally available information about good agronomic practices

The project strategically linked 55 farmers (22M & 33F) to Kenya Agricultural & Livestock Research Organization [KALRO] and other available sources of reliable farming information. This included among others; Agriculture and livestock departments, Government websites, NGOs and media programmes (e.g., *shamba* or Farm shape up on Citizen TV) on agriculture and climate change adaptation.

Activity 2.1.2: Training staff, and partners as ToTs on climate change concept and international measurement parameters on climate change adaptation targeting 25 people.

IAS K staff and partners (30=14F & 16M) were trained on climate change concept and international climate change measurement parameters.

Activity 2.1.3 Exchange visit for IAS K staff and partners to a successful permaculture farm (25 people)

The project supported farmers, partners and staff to attend an Exchange visit at Christian Impact Mission (CIM) Yatta, Machakos County. The project supported 20 participants (4F & 16M) including farmers, government officers, professionals and staff.

Output 2.2 MEL and learning

Activity 2.2.1: Procurement of smartphones and establish a simple M&E system to report on climate change adaptation actions and indicators and support continued learning.

The project procured 5 phones for use on indicator reporting and data collection to enhance continued learning. The phones have been set up with a simplified M&E system to enhance this process. The phones will be useful in various data collection processes and indicator reporting for the project activities.

Activity 2.2.2: Establish relevant data collection tool aligned with national data collection

The M&E Officer and the Project officer held a meeting with National Drought Management Authority (NDMA) team 4 (3M & 1F) to get technical assistance on establishing relevant data collection tools aligned with national data collection.

Activity 2.2.3: Evaluation of CCAM activities and recommendation for scaled activities	NDMA provided IAS K 2 questionnaires for use in developing and customising its tools for future data collection. IAS K will host a meeting to review the developed tools when ready. Evaluation is in progress
Activity 2.2.4: Share Value Chain assessment with stakeholders	The assessment report has been produced and disseminated to stakeholders.

Output 2.3 Information sharing Set up systems and partners that facilitate adaptation information and knowledge for IAS partners and local government policy makers

Activity 2.3.1: Organize Climate adaptation Cafes for professionals and academia to share knowledge and lessons learnt.	<p>A professional cafe on climate change was hosted at Tharaka University. on the 17th October 2023 that was attended by 43 (32 M & 11 F) people inclusive of professionals and people from academic institutions, CSOs and community. The topic was “Climate Change in Our Midst: The Untapped Solutions”</p> <p>The objectives were:</p> <ol style="list-style-type: none"> i. In-depth look at the effects of climate change in Tharaka ii. Share roles played by Stake holders (initiator, active participant, funder, facilitator, professionals and learners) iii. Share blended indigenous/modern mitigation processes by various stakeholders iv. Identify the opportunities that must be leveraged in climate change mitigation v. Share the sort of processes that have been or needs to be created together with the best methodologies and tools to use vi. Identify the risks from such processes for marginalized or disempowered groups vii. Act as stimulus for a change in approach to climate change resilience by stakeholders.
Activity 2.3.2: Public meetings to share knowledge.	The project held Public Awareness meetings on climate change adaptation and early warning systems at Chiakariga, Kamanyaki and Kathangacini locations reaching 152 people (48M & 104F). Further, the project deliberately targeted 112 (70M & 42F) area managers and “ <i>Nyumba Kumi</i> ” (i.e. security committees) members with awareness session on their role in promoting community climate change adaptation initiatives, enforcing policy and early warning systems. It was noted that involving the structures on the ground enables implementation of adaptation and resilience initiatives, and village managers would be effective in policy enforcement.

Activity 2.3.3: Partial scholarship for 5 students to undertake a thesis on climate adaptation.

Tharaka University, in consultation with IAS K staff, identified five (5) scholarship beneficiaries (4M & 1F) through a competitive procedure and process. The 4 male students are doing their masters while 1 female student is undertaking her PhD, and all of them are doing research in climate change related areas.

IAS K Country Director (Ms Mary Githiomi) and Vice Chancellor (Prof Peter K Muriungi) officially launched the Partial Scholarship on 14th September 2023. The university will receive Ksh 375,000.00 to support 5 students to undertake their researches.

The beneficiary students are as follows:

- i. Mr. Emmanuel Ngoci Kiboro (Masters of Science in Environmental Science)- Topic: *Impact of water scarcity on the livelihoods of rural women in Tharaka North and Maara Sub-counties, Tharaka Nithi County, Kenya*
- i. Mr. Silas Njiru Mwira (Masters of Science in Biochemistry)- Topic: *Correlation between green grams metabolites and resistance to storage bruchids infections; a potential biomarker.*
- i. Mr. Kathenya Gitonga Muthike (Masters of Science in Botany-Genetics)- Topic: *Morphological and molecular characterization of duck weed in selected wetlands and pond waters of Tharaka Nithi County, Kenya*
- ii. Mr. Samuel Mutegi Njeru (Masters of Science in Horticulture)- Topic: *Effect of Moringa leaf extract on growth, yield and postharvest quality of watermelon in Tharaka South Sub-county.*
- ii. Ms Edna Abasi (PhD in Agronomy)- Topic: *Projecting the impact of climate change on soil quality and maize yield using Apsim under rhizomicrobiome-based nutrients management in Tharaka Nithi County.*

Output 2.4 Advocacy and vertical integration

Activity 2.4.1: Strengthening communication between local and national adaptation processes to overcome projectization

The County Steering Group [CSG] and stakeholders held a meeting at Methodist centre, to disseminate the draft report on Tharaka Nithi Drought, Food Security and Rainfall Assessment. 25 stakeholders (17M & 8F) attended the meeting.

- i. The meeting challenged stakeholders to create awareness in the community to enhance environmental conservation, land and water resource management, and conservation agriculture.
- ii. The assessment report appreciated IAS K effort in supporting the community with climate change adaptation initiatives, including resilience and climate smart agriculture, school feeding and water management projects.
- iii. The CSG meeting also appreciated IAS K for supporting the CSG meetings and for the strong partnership.

Activity 2.4.2: Stakeholders meeting in a shared lobbying plan for Tharaka Nithi County climate change Fund operationalization.

The project supported stakeholders to convene 2 meetings to lobby for operationalization of community structures as enshrined in the Tharaka Nithi County climate change Fund policy. 39 people (27M & 12F) attended the 1st meeting while the successive meeting was attended by 23 people (19M & 4F) representing various stakeholders, including the Chief Officer for County Agriculture Department attended.

The 2 meetings resolved as follows;

- i. Strive towards restoration of gazetted forests (27) in Tharaka, through tree planting initiatives. A racing event to restore Mutaranga

Forest took place on 10th of October 2023 by Tharaka Innovations CBO in partnership with IAS K and other stakeholders.

- i. Revival and strengthening of the Community Forests Associations and the Ward Climate Change Committees to enhance conservation of forest, environment and water towers.
- i. Sensitization of the public on climate change and forest management, which IAS K embarked on immediately.

There were 8 activities that were not implemented fully (Table 2). All of them were procurement related. This was due to under-budgeting, leading to inability to procure.

Table 2. Activities that were not implemented indicating the reasons/ or actions that is to be taken

Activity	Reason
Distribution/ purchase of drought-tolerant seeds to 15 groups targeting 200 interested and motivated farmers with a voucher system.	In progress (Supplier already on board, having signed MoU to supply)
Purchase and distribute drought-tolerant fodder seeds to 5 groups targeting 100 interested and motivated livestock keepers	In progress (supplier already signed MOU)
Purchase hay-making equipment for selected groups	In progress (It is at the design stage by Tharaka Technical)
Purchase of dam liners and water pumps for farmers	In progress (Supplier already engaged to supply by January 2024)
Purchase hay-making equipment for selected groups	
Establish relevant data collection tool aligned with national data collection	2 reporting Tools retrieved from NDMA. IAS K to customize the tools to suit the need

3.3 Beneficiaries Biodata

The research consisted of questionnaires administered to sampled farmers in five villages, Chiakariga, Maragwa, Kanjoro, Kathangacini, and Kamanyaki. The total number of respondents was 110 out of which 107 filled up questionnaires were received back. Majority of respondents

were females (62.6%) as compared to men (37.4%). In terms of ages, the highest number of respondents were drawn from age range of 36 – 45 years. Age range of 46 – 55 constituted of about 30% respondents while age range of above 50 years comprised of 17.8%.

Almost all respondents were married (90.7%). Single and widowed persons constituted of 7.5% and 0.9 % respectively. Among the respondent, those who had attained primary school level were 52.3%, while those who had attained secondary school level were 36.4% and the rest who had diploma and degree level were 9.3% and 1.9% respectively. The occupation of the respondent greatly varied with 70.9% being farmers, 14.95% being businesspersons, 8.41% being fishermen, 3.74% being teachers while 2.80% were pastoralist.

3.4 Project awareness

From the FGDs it was clear that farmers were knowledgeable about climate change. Some described it as drought/ change of weather. Others associated it with heavy rains that led to soil erosion. They recalled that ten years back, they used to receive rain from February to May and there were permanent rivers that never dried.

When asked about the effects of climate change on the community in the focal group discussions, they had many explanations to give: -

- i. Malnutrition due to lack of food and green vegetables
- ii. Teenage pregnancy after being enticed with money
- iii. School dropouts
- iv. Low honey production in extreme dry conditions
- v. Family violence and men deserting their families
- vi. Increased theft

The later four were attributed to the resulting poverty due to low food production which is the main source of livelihood. On the other hand, they associated the following positive effects with too much rain arising from climate change: -

- i. Increased honey production
- ii. Conflict resolution due to availability of more food

On whether the respondents were aware of the project, 97.2 % (Table 2) of them confirmed that they knew about the project. Majority of the farmers who confirmed awareness of the project were derived from Maragwa, Chiakariga and Kamanyaki. Only 3 farmers

constituting of 2.8 %, mostly from Kanjoro and Kathanganchini, indicated that they were not aware of the project. Most of the respondents (85.0%) indicated that Meetings conveyed by the IAS-K were the main source of information (Table 2). This implies that the project information was adequately disseminated within the project areas by IAS-K.

3.5 Benefits of the project

To assess overall impact of the project to the farmers, their opinions were sort on whether the project had benefited them. Almost all respondents (94.4%) agreed that project had some benefits to them (Table 3).

Table 3. The Benefits of the IAS-K project on respondents

Parameter	Frequency		Percentage	
	Yes	No	Yes	No
Awareness	104	3	97.2	2.8
Did the project benefit the respondents	101	6	94.4	5.6
Drought resistance crop varieties	23	84	21.5	78.5
Drought tolerant fodder crop	37	70	34.6	65.4
Access to data and information on early warning system	45	62	42.1	57.9
Trained on water harvesting techniques	91	16	85	15
Access to water harvested	29	78	27.1	72.9
Non-village beneficiaries not in the IAS-K project	71	36	66.4	33.6
Village beneficiaries not in the IAS-K project	76	31	71	29

The main benefits identified were; training in water harvesting methods (85%), Access to data and information on early warning system (42.1%), drought tolerant fodder (34.6%) and drought tolerant crop varieties (21.5%). It is worth noting that despite the large number that were trained on water harvesting methods (85%), only 27.1% had access to harvested water. This is well explained by the list of challenges listed by the respondents. Majority of the farmers from Kanjoro, Kamanayaki and Chiakariga, in that order, enlisted more benefits than those from

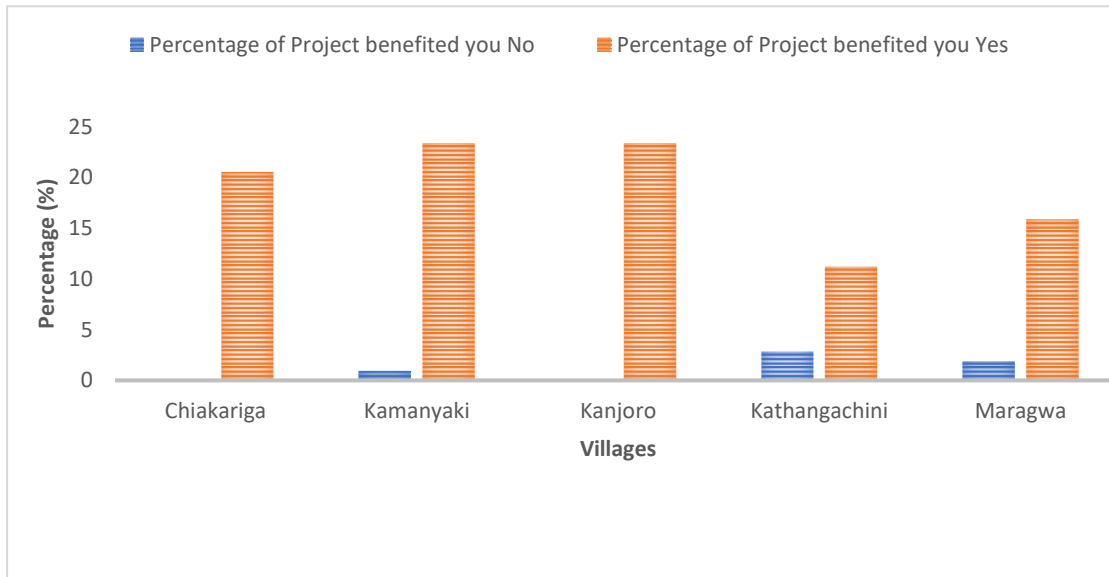


Figure 1. The percentage of respondents that benefited from the project according to the different villages under study

Respondents indicated that on average, 35 of the community members benefited from the project, majority of them being project members. Nonetheless, it was notable that farmers from Kanjoro had been trained on *Zai Pits*, a micro water catchment structure. Two farmers indicated that they did not benefit from the project because IAS K did not implement the project whereas one farmer did not have an idea how the project works. These are not valid considering the numbers we found to have participated and trained.

3.6 Access to information and Data on Early Warning

On whether information on climate change was shared, majority of the respondents in all the areas confirmed to have obtained information from IAS-K (85%) (Table 3.0). However, few people said that the information was obtained from other sources such as extension officers and mass media at 20.6% and 17.8% respectively. IAS K was the main source of information which is a threat to the sustainability of the project. Consequently, there is need to strongly bring other partners like Universities, TVET, and Government departments to be the main service providers. On average, information had been shared 3.8 times, which is too low to impact required knowledge and skills to rural communities whose levels of literacy is still low. Accordingly, more trainings on resilience and adaptation techniques, and appropriate methods of information sharing should be enhanced. Majority of the respondents confirmed that they

had received training on information sharing mainly through meetings called by IAS-K. On average, 4.0% of the respondents did not receive any training, 83.2% of the respondent received 1-5 trainings while only 12.9% received more than five trainings. Farmers from Kanjoro, Kamanyaki and Chiakariga received more training than those from Maragwa and Kathangachini. (Figure 2.0).

Table 4. Frequencies and percentages of main source of information on climate change and farming

Parameter	Frequency		Percentage	
	Yes	No	Yes	No
IAS K	91	16	85	15
Extension officer	22	85	20.6	79.4
Media	19	88	17.8	82.2
Baraza	7	100	6.5	93.5
Phone	4	103	3.7	96.3

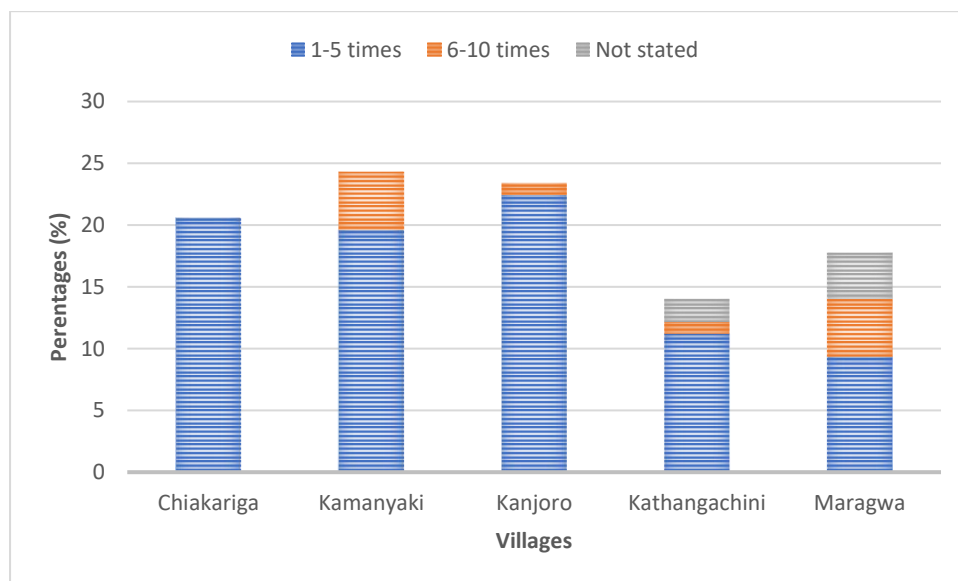


Figure 2. The percentage number of information sharing trainings each village received during the study

The main challenges in information sharing were identified in the following order; poor communication, poor network, poor infrastructure, unavailability of information, low level of literacy, low technological skills among others (Figure 3).

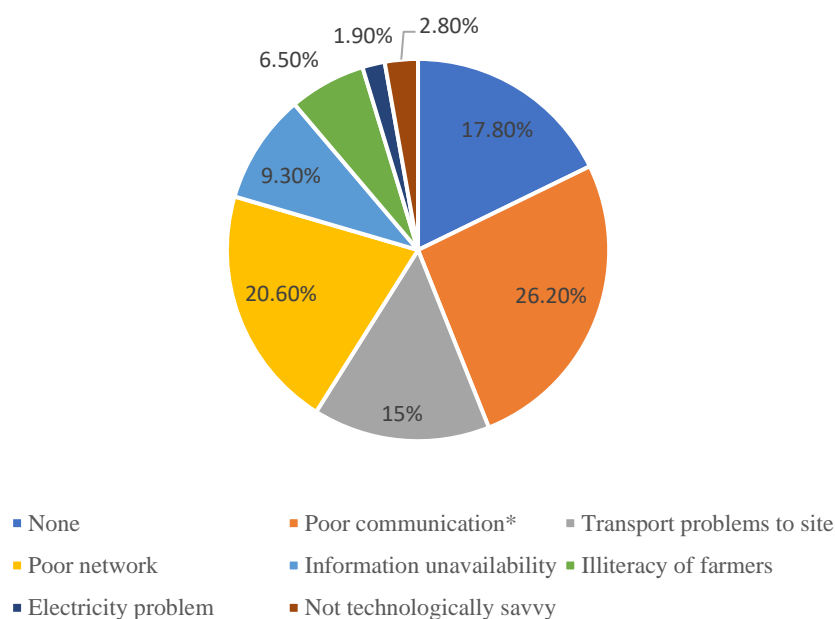


Figure 3. Pie chart represents the main challenges in accessing information

3.7 Improved agricultural production

Respondents who agreed to have received seeds for drought resistant crop varieties were 15 (14%). Most of them confirmed that they had received the seed more than once. The seeds apparently were those that were supplied by the county government. When asked whether IAS K introduced new farming methods, the respondent confirmed that they were trained on the use of early maturing varieties, crop rotation, contour farming, zai pits (Figure 4), zero tillage cover cropping, intercropping and agroforestry (Table 5).

Table 5. Frequencies and percentages on new farming methods introduced by IAS-K

Parameter	Frequency		Percentage	
	Yes	No	Yes	No
Crop rotation	96	11	89.7	10.3
Intercropping	83	24	77.6	22.4
Cover cropping	70	37	65.4	34.6
Early maturing var.	58	49	54.2	45.8
Contour farming	53	54	49.5	50.5
Terracing	53	54	49.5	50.5
Agroforestry	52	55	48.6	51.4
No tillage	36	71	33.6	66.4
Kitchen gardening	13			
Zai pits	4			



A s

Figure 4: Use of Zai pits at Maragwa village

A number of challenges hindering the implementation of the new farming methods were identified and summarized in Table 5. Inadequate capital to implement the new methods was mentioned by 29 respondents of whom 3 mentioned high seed prices, 5 indicated high cost of construction of terraces and 2 cited the cost of leasing machinery. The later involved the high cost of leasing excavating machinery that included transportation cost plus charges of KES 10000 per hour. In the FGDs, the high cost of excavation of earth dams was also mentioned. They also required between KES 80,000 – 120,000 to buy dam liners which they could not afford. Inadequate knowledge and training were raised by 9 respondents. Other challenges were found to be in the following order of importance; inadequate rainfall and water, lack of tool

and equipment for implementation, Inadequate knowledge and training, poor planting materials, early maturing varieties not easily accessed, and lack of certified varieties, lack of knowledge on available varieties (Table 6). Other challenges included lack of trained staff, lack of storage facility, lack of market.

Table 6. Frequencies of challenges in implementing new farming practices

Challenge	No. of respondents
Inadequate capital to implement	29
Inadequate rainfall and water	12
lack of tool and equipment	11
Inadequate knowledge and training	9
Poor planting materials	8
Early maturing varieties not easily accessed	6
Lack of certified varieties	6
Lack of knowledge on available varieties	1

Although 81.4 % of the respondents confirmed that the project had improved their awareness on best practices in crop production. However, majority of the respondents confirmed that they had received on average 3.7 trainings on livestock feed production, 65.4% never grew fodder (Table 7).

Table 7. Participation in livestock feeds production

Activity	Frequency	Percentage
Trained on livestock feeds production		
Yes	89	83.2
No	18	16.8
Total	107	100
Grow fodder crops		
Yes	37	34.6
No	70	65.4
Total	107	100
Approaches to fodder conservation		
Not stated	64	59.8
Standing hay	29	27.1
Bailed hay	12	11.2
Silage	2	1.9
Total	107	100

Summary of the main challenges in fodder crop production and conservation is given in Table 8. The main challenges cited was lack of access to seeds, inadequate rainfall, Knowledge/information, inadequate land for fodder crops and no bailing machines.

Table 8. Frequencies of challenges in fodder crop production and conservation

Challenge	No. of respondents
Seeds	20
Knowledge/information	12
Rainfall	12
Land	11
Bailing machine	8
Market	4
Capital/costly	2
Storage facility	2
Farmers prefer food crops to fodder crops	1

Accordingly, the following interventions were suggested by respondents; provision of farm inputs, more so certified seed, capacity building, introduction of bailing machines (Table 8).

Others were access to water related in terms of helping farmers to access water in dry season and creating community dams in the area. This is in agreement with finding solutions to the challenges facing farmers in these areas (Table 9). Capacity building is still a major intervention despite the number of trainings that have been conducted.

Table 9 Frequencies of proposed interventions by respondents to help improve farm yields

Intervention	No. of respondents
Capacity building	28
Seeds	18
Other inputs	15
Others interventions	10
Introduction of bailing machines	3
Create community dams in the area	2
Help farmers access water during dry periods	2
Nonrespondent	26

3.8 Water harvesting and conservation

Most project beneficiaries (99.1%) agreed that they harvest rainwater, with 81.3 % confirming that they obtained water harvesting and conservation training from IAS-K (Table 10). Most of those who confirmed to have been trained by IAS-K were mainly from Kamanyaki and Chiakariga at 22.3% and 20.6% respectively. On average, the farmers recorded that they had been trained 4 times. This confirms that training was frequent and effective.

Table 10 Water harvesting and conversation

Parameter	Frequency		Percentage	
	Yes	No	Yes	No
You harvest rain water?	106	1	99.1	0.9
Where did you learn to harvest water?				
Trained by IASK	87	20	81.3	18.7
Trained by other organizations	18	89	16.8	83.2
Learnt from other farmers	19	88	17.8	82.2

Water tanks were the most frequently used water storage structures with 100% of respondents confirming their use (Table 11). Other structures commonly used in harvesting water were pans, earthen dams (Figure 5) and wells, in that order. Boreholes and terraces were least used. Lack of using boreholes is attributable to cost of siting, drilling, installation and management while lack of use for concrete tanks is limited by lack of enough capital and their requirement of regular maintenance whereas lack of use of terraces is an indicator of a gap in water conservation for crops.

Table 11. Structures or equipment used for water harvesting and conservation

Structure	Frequency	Percentage
Water tanks	107	100
Pans	19	17.8
Earth dams	15	14.0
Wells	11	10.3
Terraces	4	3.7
Boreholes	3	2.8

In most cases, the structures and equipment used to harvest and conserve water were acquired by the respondents themselves. Asked on the source of equipment, 103 respondents bought whereas 5 received donations. Nevertheless, majority of the farmers (90.7%) confirmed that their interaction with IAS-K had improved their water harvesting and conservation skills.



Figure 5: Earth Dam at Maragwa

When asked to list some of the water conservation challenges, they face that IAS K project does not address, they identified the inadequacy of water storage structures as being the most hindrance where 3 mentioned earth dams, 8 water tanks and 11 were not specific (Table 12). This was closely followed by limited financial muscle to procure storage tanks, construct earth dams and buy dam liners.

Table 12. Challenges not addressed by IAS K

Challenge	Frequency
Inadequate storage facility	22
capital	9
Expensive tools	5
Inadequate Water	5
Lack of water treatment and drinkable water	3
maintenance of the earth dams	1
Long distance to get water	1

In order of preference starting with the best, respondents were asked to list the water harvesting methods they would prefer enhanced at their farms. Frequencies for the first preference mentioned are summarized in Table 12. On their own volition they preferred earth dams over plastic tanks and water pans for water harvesting near their farms.

Table 13. Structures or equipment preferred by community for water harvesting and conservation

Structure	Frequency	Percentage
Dams	29	
Plastic tanks	25	
Water pans	17	
Concrete tanks	11	
Roof catchment	11	
Tanks	7	
Boreholes	3	

Majority of the respondent accepted the fact that through IAS-K trainings they had gained an insight on how to better their water harvesting and conservation skills. Water conservation is an important practice that can help reduce water usage, protect the environment save money on utility bills and ensure the sustainability of water resources for future generations. Here are some general recommendations for conserving water which can be practiced in Tharaka North and South.

- Fixing of leaks: Leaks can waste a lot of water over time. Check your pipes regularly for leaks and repair them promptly.
- Upgrading of fixtures: Consider upgrading to water-efficient fixtures such as use of watering cans for irrigating planted trees and nursery bed irrigation. These fixtures can help reduce water usage without compromising performance.
- Reuse water: Consider reusing water for other purposes such as watering plants or cleaning. For example, you can collect water from your shower or sink and use it to water your plants.
- Water plants efficiently: Water your plants early in the morning or late in the evening when the temperature is cooler. This will help reduce water loss due to evaporation.
- Use a broom: Instead of using a hose to clean your driveway or sidewalk, use a broom to sweep away debris. This can help save a significant amount of water.

The study recommends the following measures to ensure more water harvesting and conservation in Tharaka North and South.

- Equipping and building capacity in the County Water Office for assessing the water situation, and storing such information for development purposes.
- The County Water Office be facilitated to receive information about prospective water investments for inventory and regulation purposes.
- Working more closely with the local NGOs involved in the community on strategic plans and policy formulation.
- A study be undertaken to determine the potential of ground aquifers recharge rate in order to guide the regulation on spacing and depth of boreholes.
- Mobilizing people and sensitizing them on the best practices for water management and use. This should include the formation of water user associations.
- Ensuring water sources are legal and metered to facilitate efficient use, minimize wastage and raise revenue for enhancing water resources development.
- Investing in more friendly water drawing systems that are solar or wind powered to ensure that women and children can also access water with ease.
- Investing in more public water points to supply affordable water to all with minimal cost specially to take care of the financially disadvantaged groups.
- Enhancing water storage and distribution to reduce distances travelled in search of water.
- Investing in water supply systems to take advantage of the perennially flowing Kathita River for domestic and other uses.
- Sensitizing the community on water sources management, protection and effective waste disposal to avoid contamination, possible disease outbreaks and accidents. The management of springs and earth dams should take into consideration planting grass and trees around them as a remedial measure of countering erosion and the subsequent siltation, and constructing water collection and livestock watering points.
- Training of more water committee members who will become resource people in the community to assist with water harvesting technologies.

3.9 General impact of the project

To measure the respondents' altitude and thus establish impact of the project among the beneficiaries, a Likert scale was used. Four outcomes; improved crop production, improved livestock production, water conservation as well as sharing of early warning information

systems, were scored against the five levels of Likert scale. On average, majority of the respondents had a positive attitude towards the project. For example, concerning the enhanced crop production, majority of the respondents either highly agreed or agreed the project had enhanced the crop production (Highly agreed, 67.35%; agreed, 24.3%). A similar trend was also realized in the other three projects outcomes (Table 14).

Table 14 Percentages of the general impact of IASK project on the community

Parameters	Highly agreed	Agreed	Not decided	Disagreed	Highly disagreed
IASK project enhanced crop production practices	67.3	24.3	6.5	0.9	0.9
IASK project enhanced water conservation practices	41.1	43.9	11.2	1.9	1.9
IASK project enhanced access to information on early warning systems	30.8	36.4	28.0	2.8	1.9
IASK project enhanced livestock feeds production and conservation practices	29.0	54.2	12.1	2.8	1.9

The positive attitude was further confirmed from life stories collected from the willing respondents. For example, according to Mr. Jackson Nyaga, a respondent from Maragwa village, IAS-K has improved both livestock and crop production practices. *“IAS-K is a good organization that has helped many farmers in the community to improve crop and livestock production”* his comments were further echoed by Salesio Njagi from Kanjoro village who commented that *“the project has introduced new farming methods such as use of Zai pits and kitchen gardening that has enhanced farm productivity”*.

3.10 Strengthening vertical integration

A look at the challenges facing the farmers were, poor communication, illiteracy, poor infrastructure, lack of inputs, shortage of water, no capital among others (Figure 3 and Tables 5, 7 & 11). There is no one institution with the capacity to effectively handle all the areas mentioned satisfactorily. The success of the project requires the concerted efforts of beneficiaries, project implementors to offer support, academia to offer solutions to the unknown and gaps through research and training, while top government officials to come out with conducive policies favoring development. All interviewed participants invited for FGD confirmed that IAS-K involved different stakeholders in implementing their project. Indeed, agricultural officer in Tharaka North confirmed that unlike other NGOs working in the region, IAS-K involved his office fully. *“This project is bound to succeed because my office was fully*

involved in all stages of the project Implementation. I am informed of the project objectives, my officers participated in selecting beneficiaries and supervised implementation of project activities such as making of farm ponds in Maragwa". The project mainly involved local administrators, agricultural officers, water resource management officers, academia from Tharaka university, self-help groups among others. From the discussions, the participants confirmed to have been involved in all community engagements such as capacity building, public communications and project activities.

The project embraced a good working relationship with the academia where 5 postgraduate students of Tharaka University were supported to carry out their research. These grants were to address some climate related gaps in the area. Five students were given a grant of KES 375,000 as indicated in table 14.

Table 15. Grants offered to Postgraduate Students

Name	Title of Research	Status
1. Ms Edna Abasi (PhD in Agronomy)	Projecting the impact of climate change on soil quality and maize yield using Apsim under rhizomicrobiome-based nutrients management in Tharaka Nithi County.	Collecting data for analysis
2. Mr. Samuel Mutegi Njeru (Masters of Science in Horticulture)	Effect of Moringa leaf extract on growth, yield and postharvest quality of watermelon in Tharaka South Sub-county	Collecting data for analysis
3. Mr. Emmanuel Ngoci Kiboro (Masters of Science in Environmental Science)	Impact of water scarcity on the livelihoods of rural women in Tharaka North and Maara Sub-counties, Tharaka Nithi County, Kenya	Analysing data and writing thesis
4. Mr. Kathenya Gitonga Muthike (Masters of Science in Botany-Genetics)	Morphological and molecular characterization of duck weed in selected wetlands and pond waters of Tharaka Nithi County, Kenya	Collecting data for analysis
5. Mr. Silas Njiru Mwira (Masters of Science in Biochemistry)	Correlation between green grams metabolites and resistance to storage bruchids infections; a potential biomarker	Collecting data for analysis

In order to strengthen vertical integration with private sector, local government, civil society and academia, the following recommendation were made:

1. Joint Planning and Needs Assessment: NGOs and stakeholders should initiate collaboration by jointly conducting needs assessments and planning activities. This

collaborative approach helps in identifying gaps, avoiding duplication of efforts, and ensuring a comprehensive strategy.

2. **Resource Sharing:** Collaborative efforts should focus on sharing resources, networks and expertise whether they be financial, human, or technical, to maximize impact.
3. **Policy Advocacy and Implementation:** Advocacy for policies that support integration. Collaboratively designing and implementing policies ensures that they are practical, inclusive, and responsive to the community's needs.
4. **Monitoring and Evaluation:** Establishing a joint monitoring and evaluation framework enables assessment of the impact of integration initiatives. Regular feedback and evaluation help in refining strategies and improving outcomes.
5. **Public Awareness Campaigns:** Public awareness campaigns help in garnering support from the community and other stakeholders, creating a conducive environment for successful integration.

From the interview it can be concluded that collaboration is a powerful tool for achieving sustainable integration. By adhering to principles of mutual understanding, shared goals, open communication, and practical steps for collaboration, the partnerships can make a significant and lasting impact on the well-being of communities. Through joint efforts, NGOs, local governments and other stakeholders can foster an environment that promotes inclusivity, social cohesion, and overall community development.

3.11 Sustainability

On average, 21.6 farmers who were not members of the project from the village were reported to have derived some benefits from the project by 29% of respondents, on the other hand 33.6% of respondents reported an average of 21.4 farmers (per respondent) as non-village beneficiaries not in the IAS-K project (Table 2). It is important to note that whereas IAS K could not recruit the whole community in the project, those who were left out made efforts to benefit from members. Thus, the activities of the project were replicated beyond the project scope giving a clue of the high demand for the project where non-members had the urge to learn.

Economic stability through kitchen gardening and zai pits technology was mentioned in the FGDs. One farmer said that he had been spending KES 500 on buying vegetables which he no longer did and a number of other farmers were learning from him by replicating the technology. The training of trainers (ToTs) continued to be a source of information in the community. Apparently, this could be the reason

why 28 respondents proposed capacity building as one of the interventions, despite the number of trainings that had been conducted (Table 8). Lack of access to planting materials, bailing machines, storage facilities, market of fodder crops came out among the challenges (Table 7) which needs to be addressed to avoid their negative effects on sustainability of the project

3.12 Gender/Youth

From FGD, it was gathered that women and youth were most affected by climate change. These demographic groups are impacted in varying ways and thus experiencing unique challenges and vulnerabilities. The key impacts that were identified for the women and youth in the project area included:

1. **Livelihood Challenges:** Women and youth, particularly in the project area often engaged in agriculture and other climate-sensitive sectors. Changes in weather patterns and extreme events can impact their livelihoods, leading to economic instability.
2. **Education:** Climate change-related disasters can disrupt education, affecting youth disproportionately, with girls often more likely to be withdrawn from school in times of crisis to help with household tasks or due to increased economic pressures
3. **Economic pressures** resulting from climate change contributes to school drop out and early pregnancies. Men sometimes desert their homes leaving women with the responsibility of taking care of the families. This also results in increased gender based violence
4. **Health and Nutrition:** Climate change can impact food security and nutrition, affecting the health and development of youth and pregnant women. Malnutrition and increased susceptibility to diseases are potential consequences.
5. **Social and Mental Health:** The uncertainty and challenges brought about by climate change can contribute to increased stress, anxiety, and mental health issues among youth, especially those in regions experiencing frequent extreme weather events.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1. Conclusion

The evaluation was conducted to identify important achievements, challenges and give recommendations for future actions. The project was found to have indeed managed to implement most of the activities, achieved most of the expected outcomes, identified challenges and made recommendations on the project. About 97% of farmers were aware of the project through meetings conveyed by IAS K (85%). Almost all respondents (94.4%) benefitted from the project by trainings on modern agricultural practices, water harvesting & conservation and accessing information on early warning systems for improving livelihoods.

This project was successfully implemented; however, it unearthed a number of issues and challenges that need to be addressed. This included access to inputs, financing of innovative climate change adaptation practices and support tools and equipment. In this project more effort was directed towards building capacity of farmers; however, they did not have capital to implement the practices learnt. A good example is where 85% of farmers were trained on water harvesting methods but only 27% had access to harvested water. This was attributed to the high cost of tools and equipment involved, including the dam liners and hay baling machines. Lack of inputs, more so planting materials, also featured prominently as a major challenge. It is also worth noting that despite the number of trainings, capacity building was still mentioned as a major intervention for the success of the project.

Inadequate rainfall and water still remained major obstacles hindering the implementation of new farming methods by farmers.

IAS K was the main source of information to the farmers which is a threat to the sustainability at the end of the project. All farmers reached were advised on where to retrieve information; extension officers, google, partners like Tegemeo, Farm Africa, Government departments, Academia- (University, Tharaka Technical, Kenya Water Institute etc.)

Regarding the general impact of the project, which was measured on the Likert scale, there was enhanced crop and livestock feeds production and water conservation practices. Considering the short duration of the project, the impact of the project on livelihoods could not be measured. However, those who practiced short-term maturing crops, like kitchen gardening, realized increased incomes from the sales and a saving on the money they used to spend.

The project did well in applying vertical integration involving beneficiaries, service provision and top government decision makers to work together for better control of the system. Not forgetting the academia to offer solutions to the unknown and gaps through research and coming out with innovative ideas to counter climate change shocks and stress. Top government officials were a blessing in this integration to help come out with conducive policies favoring development. Suppliers of inputs are also key stakeholders in this project to ensure farmers have easy access to requirements to support improved practices and climate change adaptation. They can also play a key role in training as they sell their products.

4.2 Recommendations

1. Foster collaboration and knowledge-sharing among farmers and other stakeholders through field days and field visits enabling them to learn from each other's experiences and collectively address climate challenges.
2. Establish and strengthen early warning systems for extreme weather events such as droughts based on indigenous knowledge and modern systems. This will enable farmers to prepare in advance and take necessary measures to protect their assets.
3. Foster community-based water management approaches, by encouraging local communities to collectively harvest and conserve water. Dams were the most preferred method of water harvesting and farmers require support in their construction. Alternatively, Tharaka has a number of permanent rivers from which piped irrigation water can be tapped.
4. Link farmers to inputs suppliers and microfinancing institutions to access inputs and capital for improved modern farming practices and climate solutions. This will enable farmers to acquire planting materials, hay baling machines, water harvesting tools and machines and other tools and services which may be difficult to source in these remote areas.
5. Support professional cafes where technological gaps can be handled through vertical integration with the professionals and academia focusing on introduction and adoption of new technologies
6. Bring on board other stakeholders like Universities, TVETs, Kenya water institutes and government departments that have clear mandates of initiating development programs in the community. They should be the main source of information to farmers. This will ensure continuity of the project when IAS K winds up.
7. Continue supporting postgraduate research which will be an avenue for coming up with innovative solutions for improved agricultural practices and climate change challenges

8. IAS K to consider starting a long-term project within Tharaka North and South on climate change adaptation program. This will require an engagement with the local communities giving space to the identified challenges and recommendations mentioned in this report. It is recommended that IASK implement the project in partnership with County Government of Tharaka Nithi and work to have the project entrenched in the county integrated development plan for purposes of upscaling and sustainability.

APPENDICES

Appendix A. Members of the Team

Team Member	Role
Prof. Levi Musalia	<ul style="list-style-type: none"> a) Team leader b) To assess and bring out the outcome for the project in relation to climate change adaptation during the implementation period with focus on issues related to agricultural production c) Generate recommendations for strengthening of vertical integration as per CISU definition to private sector, local government, civil society and academia d) Give other recommendations for a new programme to be submitted to CISU CCAM February 2024
Dr. Mariciano Mutiga	To assess and bring out the outcome for the project in relation to climate change adaptation during the implementation period with focus on ecological issues.
Dr. Mary Karuri	To assess and bring out the outcome for the project in relation to climate change adaptation during the implementation period with focus on socio-economic issues.
Mr. Kennedy Mutugi	<ul style="list-style-type: none"> a) To assess and bring out the outcome for the project in relation to climate change adaptation during the implementation period with focus on b) Give recommendations to appropriate water resourcing methodologies for the area related to Climate Change Adaptation

Appendix B. Questionnaire for Beneficiaries

Introduction

IAS Kenya is a Non - Governmental Organization registered under the NGO Coordination Board in Kenya. It was registered in 2004 and is affiliated globally to both IAS Alliance and programme countries. The organization seeks to empower communities through promotion of access to education, sustainable livelihood, environmental stewardship and human rights. IAS Kenya has been actively involved in agriculture, disaster risk reduction and resilience programming in the semi-arid region of Tharaka for over 17 years. We are conducting an evaluative research to gather essential data for the project's transition to the next phase and pinpoint key areas for advancing climate change adaptation in Tharaka North and South Sub-Counties. We therefore request you to voluntarily provide information on these issues to help achieve objectives of this study. Any information provided shall be treated with utmost confidentiality and will not be used for any commercial gains thereof.

Do we have your consent to proceed with the interview? Yes (....) No ().

If consent is denied, DO NOT interview the respondent.

Bio- Data

1. Gender: M () F ()
2. Marital Status: Single () Married () Separated () Divorce () widowed ()
3. Community: Chiakariga, (), Maragwa (), Kanjoro (), Kathangachini () Kamanyaki (), Others:
4. Education Level: Primary (.), Secondary (.), Diploma (.), Degree (.), Postgraduate (.), No education (.), Others:.....
5. Occupation: Business (.), Pastoralist (.), Both (.), Farmer (.), Fisherman (.), Hunter (.), Civil Servant (.), Teacher (.), Others:.....
6. Rank if employed:
7. Religion: Muslim (.), Christian (.), Others:

Improved agricultural production

1. Are you aware of the IAS-Kenya project? Yes (.), No (.)
2. If yes, when did you know about it?
.....

3. If yes, how did you know about it? Baraza (), Through extension officers, (...), IAS-K meeting, (), Other () specify
.....
4. Has the project benefited you in any way? Yes (), No ()
5. If yes, how have the projects benefited you? i) Obtained drought resistant crop varieties () (ii) Obtained drought tolerant fodder crop varieties (), (iii) Accessed data and information on early warning system (), (iv) Trained on water harvesting methods (), (v) Access to harvested water () (vi) Other benefits (Specify)
.....
6. If the IAS Kenya Projects have NOT been of benefit to you, Explain:
.....
.....
7. Have other farmers not in the project benefited? Yes (), No (). If yes, Indicate the approximate _____ number
.....
8. What is the proportion of farmers who have benefited in your village? 25% (), 50% (), 75% (), 100% ()
9. Have you attended any meeting by IAS that shared information on climate change issues? Yes (), No ()
10. Which new farming method/ techniques would you say have been introduced since the inception of the IAS Kenya Projects? (i) Early maturing varieties () (ii) Crop rotation (), (iii) Contour farming () (iii) terracing () (iv) minimum tillage () (v) cover cropping (), (vi) others () (specify).....
11. Do you grow fodder crops? Yes () No ()
12. If yes, how do you conserve fodder (i) Standing hay (), (ii) Bailed hay, (iii) silage (iv) others (specify)
.....
13. Propose interventions that IAS Kenya can include in their programs that can help farmers to improve farm yields.
.....
.....
.....

.....

14. In a scale of 1-5 ranging from Highly agreed, agreed, not decided, Disagreed, highly disagreed; tick the most appropriate response for the following questions:

	Question	Highly Agreed	Agreed	Not decided	Disagreed	Highly disagreed
1	Project by IASK has enhanced crop yields					
2	Project by IASK has enhanced livestock feeds					
3	Project by IASK has enhanced water conservation					
4	Project by IASK has enhanced access to information on early warning systems					
5	Project by IASK has enhanced livelihoods					

15. Do you harvest rain water? Yes () No ()

16. How did you learn how to harvest/conserve water?

Trained by IAS_K (), Trained by other organization (), Learnt from other farmers (), Any other (specify).....

17. What structures or equipment do you use for water harvesting?

Plastic tanks (), Concrete tanks () Pans, () Earth dams () wells, () Boreholes. () Terraces () Others () (Others specify)

.....

18. How did you obtain the structuresequipments used for water harvesting and conservation?

.....

19. Are there other materials/tools/equipment at your homes/farm/village that are associated with IASK Project? Yes () No ()

20. If yes Name them;

a) Home.....

....

b) Farm.....

.....

c) Village

.....

21. What are the uses of the structures /equipment you have named in 2 above?

.....

.....

.....

.....

22. Are the structures/ Equipment in use? Yes () No ()

23. If NO, give reasons why not in use.

.....

.....

.....

.....

.....

24. If YES, can you show us the structures and equipment you have identified above?

Yes () No ()

(If yes, take photos and record down observations on, type, use, status, and any other relevant information)

25. Give us a story about IAS-K from the time you came to know it until now (Record and write down the main points of the story)

26. Did the IAS Kenya Project improve your way of life in any way? Yes (.), No (.)

Explain

.....

.....

.....

27. According to you, which other interventions would you propose?

.....
.....
.....
.....
.....

Appendix C. Guidelines for Focus Group Discussions

Introduction:

My name is _____ from Tharaka University. I am collecting data to evaluate the support that International Aid Service (IAS) has accorded farmers in Tharaka North and South sub counties to mitigate the effects of prolonged droughts that occur in the region because of adverse weather attributable to climate change. Welcome and thank you for participating in this focus group discussion. Your insights as community leaders are crucial in understanding the broader impact of the support provided to farmers in Tharaka North and South. Please share your opinions openly.

Attendance list

Name	ID	Location	Position	Sign

11. Knowledge /awareness of climate change
12. Effect of climate change on agriculture.
13. Support offered by IAS-K in adopting to climate change challenges/drought.
14. Specific indicators or outcomes used to gauge success
15. Impacts of the project on farmers' livelihoods
16. Engagement in information sharing activities
17. Challenges faced by farmers despite the support received.
18. Collaboration between the community, county government, and non-governmental organizations in addressing climate change challenges.
19. Areas of improvements to enhance collaborations
20. What are the youth/women related issues of the highest priority? How can the stakeholders be prepared to handle the issues?

Appendix E. Interview Guidelines and Response by Project Coordinator

1. Who are the stakeholders in this project?

- Farmers through Self Help Groups and Cooperative Associations
- GOK- Min of Agriculture & Livestock, Water Department, Kenya Forest Services, Min of Interior (especially sub-county levels and local administration), Environment Department
- National Drought Management Authority

- Community Based Organisations- Tumaini CBO, Tharaka Inventions Circle CBO, Tharaka Children & Women CBO, Tharaka Green Gold CBO, RIDEP CBO, SAPAD CBO
- Faith Based Organizations- Churches
- Academia- Tharaka University, Kenya Water Institute- Chiakariga, Tharaka Technical and Vocational College
- Private Sector- Tegemeo Cereals Ltd
- Tharaka County Steering Group
- NGOs- Plan International, WHY Kenya, Farm Africa

2. What were the main roles performed by the stakeholders?

- Facilitating trainings to farmers
- Joint reporting forums e.g. CSG and NDMA
- Policy influencing and reinforcement
- Supporting in research and innovations- e.g. Tharaka University, Tharaka Technical
- Community mobilization and information dissemination
- Provision of security during project implementation
- Implementation of project activities
- Field monitoring

3. How did the stakeholders react to the project? Did they accept to join it easily?

Did they participate in its activities? If not, why?

- The response was positive with adequate cooperation, support and effective participation in project activities.
- They recommended for an extension of the project to create more impact

4. Did the project instigate changes among individuals involved in the project? What were these changes if any?

- a) Yes, the project instigated changes in the community, creating more appetite for knowledge and information on improved water harvesting and agronomic technologies
- b) Some of the changes instigated by the project included, among others;
 - Attitude change towards agribusiness
 - Adoption of improved agricultural methods, and

- Adoption of micro-water harvesting technologies, e.g. water pans for irrigated agriculture as opposed to rain-fed agriculture.
- Embracing cost-sharing culture for effective programming in the community

5. What were the strengths and weaknesses of the project?

Strengths

- Available funding
- Qualified implementing team
- Vertical integration and coordination approach, with emphasis on government structures taking lead in provision of related services in the community
- Strong partnerships
- Project focused heavily on climate change adaptation and resilience as opposed to mitigation
- Well-thought out work plans and procurement plan that supported implementation
- Donor goodwill
- Quality M&E framework, aligned to the Theory of Change

Weaknesses

- Many activities with short time to implement
- Slow implementation where activities relied on MOUs with some partners
- Low budget for some activity lines hence reduction of reach and quantity of items/ sessions

6. What were the main challenges that face this project?

- Some partners were too slow to enjoin in MOU with IAS Kenya hence affecting joint implementation
- Some activity lines were under-budgeted which meant reduced number of reach as well as reduced number of project items bought.

7. How were the objectives of the project formulated?

- A participatory approach was employed right from design of the project with community taking lead.

8. Did the Stakeholders participate in setting these objectives? How?

- Yes, stakeholders participated in the design of the project and mapping out the outcomes of the project through organized meetings and forums, FGDs and consultations.

9. Which of the project objectives were achieved and which were not achieved?

Why?

- All the 2 project objectives/outcomes were adequately achieved.

10. What were the outcomes anticipated for this project? Which of them were realized? Which of them were not fulfilled? Why?

The project successfully achieved the following outcomes;

- Improved agricultural production introduced for 1090 farmers in Tharaka Nithi County through innovative and enhanced and scalable climate change adaptation strategies by the end of December 2023" with majority of target farmers attaining increased adaptive capacity.
- Enhanced knowledge and learning on climate change adaptation and optimized integration, coordination, and alignment

11. What can be incorporated to make the project have more impact?

- Outcome on water sustainability for improved and progressive agricultural production.
- FLLOCA guidelines with emphasis on capacity strengthening of community structures for effective implementation of climate change adaptation activities in the community.
- Increased professional cafés and community dialogues, to influence research and innovation ideas.

12. How do you expect the project to progress in the future?

- Upscaling the project activities in the next phase, with more emphasis on water sustainability.

13. What can be done to help in maintaining the future sustainability of the project?

- Establishing a business model that enhances agribusiness financing, ownership and cost sharing.
- Partnership with academia and professionals to continue research and innovations for improved agricultural production.
- Linkages with private sector for supply of inputs and equipment at affordable cost, and information centers for learning and adoption of innovations.

14. What are the youth/women related issues of highest priority? How can the stakeholders be prepared to handle these issues?

- Youth and women are the most marginalized and vulnerable during any climate change crisis.
- Stakeholders can join forces to enhance inclusion of youth and women in adaptation and resilience initiatives for employability and coping during climate crisis.

Appendix D. VERTICAL INTEGRATION (TELEPHONE INTERVIEW)

The following key informers will be engaged in telephone interview on the best practices that will promote vertical integration.

1. CEO Agriculture
2. CEO Environment
3. County Directors
4. Private sector
5. Academia

Appendix F. List of people interviewed

INTERNATIONAL AIDS SERVICES – KENYA

LIST OF RESPONDENTS.

1	JULIUS MUGAO
2	JENIFFER GATUURA
3	MARY GATIRIA
4	JOSPHINE GAKUNDI
5	CELINA KANYUA
6	NATHAN MUITI
7	JULIA KAUMBI
8	ANNA KAJERA
9	CHARLES MUTURI
10	JANE MOKEMA
11	JAMES MATI
12	AGNES GACHAGI
13	GERALD KAMWARA
14	JOSEPH MURITHI
15	CIAMWARI NTHIGA
16	DANIEL MUKUNDI
17	RAEL MAKENA
18	ESTHER MUTHONI
19	PRISCILLAH MWENDE
20	SAVINA GATIRIA
21	PURITY MUTHONI
22	FLORA KARITHI
23	SISINIO KARUGU GAICHU
24	JIREMANO KIBII
25	CELINA KAWIRA
26	AGNES KATHUURE
27	NYAGA ZEPHANIAH
28	GERALD RUGURI
29	LYCLIA KAIRIMIRI
30	ABRAHAM KIMATHI
31	FABIANO KIANIA THIORA
32	SAVINA KABURI
33	MERCY MUTHENGI
34	CELINA NTUGI
35	MARY GATIIRIA
36	TARESA KANG'ARIA
37	JAMES MWIKAMBA
38	SIMON MUGAMBI
39	JOHN MUTIIRIA MUTEA
40	PURITY KAGWIRA

41	JOSEPH KIREMA
42	BEATRICE KAREA
43	MARY MUNYA
44	MOSES KITHINJI
45	DANIEL KAMAU
46	SILAS KIAMBATI
47	JUDY EMILY
48	MARY GATIRIA MUGAMBI
49	JEDIDA KAURA
50	FAITH MAKENA
51	ANNAH KARIMI KIRIMI
52	GERALD MUGAMBI KWARIA
53	JULIUS IRUNGU ICHERIA
54	ANN K. CHABARI
55	JOHN MUTHENGI
56	PARTICK JOGOO
57	KAMWARA ELIJAH NJUKI
58	JACINTA MUKETHI
59	WILFRED MURIUKI
60	DORCAS KARITHI
61	KIMATHI MUTIRIA
62	ZIPPORAH KAMENE
63	DORRIS KATHAMBI
64	DAVID MUTHAURA
65	CHARITY KARIMI
66	JOHN MUGAMBI
67	ESTHER KARIMI
68	DORCAS KAGENDI
69	MARGARET KANONO
70	DORRIS KANYORE
71	SARAH KARIUKI
72	ELIZABETH KAMUNDA
73	AMON MUTWIRI
74	MONICAH MWENDE
75	EVAGELINE KAGENDO
76	WINJOY MAKENA
77	SOLOMON KIRUGI CHOBIA
78	DAVID NYAGA NJERU
79	FRANCIS BUUTA
80	EDWARD NTHATU
81	KANYAKI KAIBIRU
82	REGINA KARIMI
83	CELINA KATHAO
84	MARY MUNDA
85	GRACE CIAKARUGU
86	MERCY KARIMI

87	JEMIMAH KARIMI
88	PETER MURUMPI
89	MONICAH NDUGO
90	EASTHER KATHAMBI
91	JOYCE MAKENA JOYCE KABEA
92	JOSPHAT MUNYAUKI NJERU
93	PETER KINYUA
94	STANLEY KIENJA
95	TABITHA GATUURA
96	PENINAH KAGWIRA
97	CECILIA KAGENDO
98	DAVID MUCHOMBA KATHENYA
99	JAMES KIRIMI
100	PATRIC KIMATHI
101	JOYCE KANYUA