

**RECALL BASELINE SURVEY FOR THE ENHANCED  
CLIMATE CHANGE ADAPTATION FOR IMPROVED  
AGRICULTURAL PRODUCTION FOR 1090 FARMERS  
IN THARAKA NORTH AND SOUTH BY END OF  
DECEMBER 2023**



**FINAL REPORT**

## ACKNOWLEDGEMENTS

The consultants for this assignment wish to convey their gratitude to IAS Kenya for the opportunity to undertake the recall baseline survey for the enhanced climate change adaptation for improved agricultural production for 1090 farmers in Tharaka North and South. We wish to express similar gratitude to all the people in Tharaka North and South who took their time to sit with us and share their experiences regarding the project. It is our hope that the collective efforts that went into this survey will contribute towards the wider objective of IAS Kenya to enhance climate change adaptation for improved agricultural production for the target communities, and in the process contribute towards making Kenya more resilient to the negative impact of climate change in the country.

Signed on this 18<sup>th</sup> day of December, 2023 by:



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### **DISCLAIMER:**

*This is the work of an independent consultant. Opinions expressed in this report should in no way be taken to represent the position of IAS Kenya.*

## TABLE OF CONTENTS

ACKNOWLEDGEMENTS .....	i
TABLE OF CONTENTS .....	ii
LIST OF TABLES AND FIGURES .....	iii
ACRONYMS AND ABBREVIATIONS .....	iv
EXECUTIVE SUMMARY .....	v
1. INTRODUCTION .....	1
1.1 About IAS Kenya .....	1
1.2 Background and Context .....	1
1.3 Aim and Objectives of the Baseline Survey .....	3
1.4 Scope of Work .....	3
2. LITERATURE REVIEW .....	6
2.1 A Common Understanding of Key Concepts .....	6
2.2 Tharaka Nithi County .....	7
2.3 The Effects of Climate Change in the Target Locations .....	9
2.4 Existing Climate Change Adaptation Practices .....	9
3. METHODOLOGY .....	10
3.1 Desk Review .....	10
3.2 Identification of Study Population .....	10
3.3 Study Sampling .....	10
3.4 Sample Targeting .....	11
3.5 Key informant interviews (KII) .....	12
3.6 Focus Group Discussions (FGD) .....	12
3.7 Mixed Methods .....	13
3.8 Data and Information Analysis .....	13
3.9 Respondent Information .....	14
4. PRESENTATION AND DISCUSSION OF FINDINGS .....	16
4.1 Findings on Project Indicators .....	16
4.2 Findings on Constraints and Challenges faced by Farmers .....	22
4.3 Findings on Cross-cutting Issues .....	23

4.4 Findings on Lessons Learnt.....	25
4.5 Findings on Further Opportunities to Explore .....	25
5. CONCLUSION AND RECOMMENDATIONS.....	26
LIST OF ANNEXES .....	28
REFERENCES .....	29

## LIST OF TABLES AND FIGURES

Table 1 – Scope of content .....	3
Table 2 – Calculation process of the study sample .....	11
Table 3 – Study sample size and distribution .....	12
Table 4 – Key informants .....	12
Table 5 – Respondent distribution by role and sub-county .....	14
Table 6 – Respondent distribution by gender .....	14
Table 7 – Respondent distribution by HH size .....	15
Table 8 – Respondent distribution by disability .....	16
Table 9 – Farmers who have attended information-sharing events .....	20
Table 10 – Feedback on the effectiveness of information-sharing systems .....	21
Table 11 – A summary of constraints and challenges faced by farmers .....	22
Figure 1 – Map showing Tharaka North and South Sub Counties .....	7
Figure 2 – Respondents on planting drought-tolerant seeds .....	17
Figure 3 – Respondents on growing drought-tolerant fodder .....	18
Figure 4 – Availability and accessibility of relevant data and information for the early warning system .....	19
Figure 5 – Farmers adopting water harvesting technologies .....	19

## ACRONYMS AND ABBREVIATIONS

ASAL	Arid and Semi-Arid Lands
CBO	Community Based Organization

CIDP	County Integrated Development Plan
CISU	Civilsamfund i Udvikling
DTC	Drought Tolerant Crops
DTF	Drought Tolerant Fodder
FGD	Focus group Discussion
IAS K	International Aid Services- Kenya
IFAD	International Fund for Agricultural Development
ILO	International Labour Organization
KEWI	Kenya Water Institute
KII	Key informant interviews
KNAP	Kenya's National Adaptation Plan 2015 - 2030
KNBS	Kenya National Bureau of Kenya Statistics
MDC	Mobile Data Collection
MEAE	Monitoring and Evaluation Academy of Excellence
MEL	Monitoring, Evaluation and Learning
NAP	Kenya's National adaptation Plan
NCPWD	National Council for Persons With Disabilities
NDMA	National Disaster Management Authority
NEMA	National Environmental Management Authority
NGO	Non-Governmental Organization
SHG	Self Help Group
SMC	Swedish Mission Council
SPSS	Statistical Package for the Social Sciences

## EXECUTIVE SUMMARY

### Introduction

In the month of December 2023, IAS Kenya commissioned a recall baseline survey of the project *“Enhanced climate change adaptation for improved agricultural production for 1090 farmers in Tharaka North and South by end of December 2023”*. The aim of the intervention is to enhance the adaptation practices of target communities in Tharaka North and South, in an effort to improve their agricultural production, and in the process also enhance their food security.

## **Objective**

The purpose of the survey was to capture data and information establishing the prevailing situation in the targeted villages and households prior to the project implementation. This would help to contextualise the real challenges faced by the beneficiaries, and in the process also capture data on the effect of climate change, identify the poorest and vulnerable groups, and provide an indication of the change in weather patterns that has impacted the communities. The specific objectives of the survey included to improve the understanding of constraints and challenges faced by target participants, and their current state of needs; provide benchmarks of outcome level indicators against which future impact of program will be assessed; and to strengthen program monitoring by identifying lessons learned and evaluate the program through appropriate utilisation of baseline information.

## **Methodology**

The survey employed a blend of interactive methodologies that were targeted at generating as much information as possible through the involvement of stakeholders. These included a desk review of available documents; the choice of exploratory study design method; the use of standard interview methods together with key informant interview methods; the use of general discussion methods as well as focused group discussions; the use of farmers survey method, where the Kobo Toolkit was the primary tool for the administration of survey questionnaires. In the data analysis, the survey employed the Kobo Toolkit as well as MS Excel, and SPSS.

## **Survey Findings**

### ***The findings of the survey on the baseline data:***

- The number of farmers growing drought-tolerant crops or seeds was 97.6% of the target population
- The number of farmers who have adopted drought-tolerant fodder 92.9% of the target population
- The most common drought-tolerant seeds grown include millet, green grams, cow peas, sorghum, pigeon peas, and a little maize. These were grown mostly on 2 acres farms
- The baseline data for farmers reporting on the availability and accessibility of relevant data and information for the early warning system was 79.1% of the target population
- Farmers adopting water harvesting technologies stood at 87.2%
- Staff and partners with improved knowledge on climate change adaptation was 100%, even though they were all receptive to new information
- The baseline data for the number of information-sharing sessions held; the number of participants attending the information-sharing events; policymakers and government officials engaged in information-sharing activities; and the effectiveness of information-sharing systems and activities, were all set at zero (0)
- 5 students had received their partial scholarship from the project, had commenced their studies and writing their theses

### ***Findings on constraints and challenges faced by farmers***

Among the challenges and constraints faced by the farmers included food shortages, especially during disasters; loss of lives and livelihood assets, also during disasters; perennial water shortage for domestic and agricultural use; soil erosion, and the loss of farming lands; reduced land sizes and land fertility; poor access to farming inputs; constrained access to certified seed

varieties; poor harvests which could sustain household livelihoods; the presence and impact of middlemen, between the farmer and the market; limited access to good markets; limited access to transport to better but distant markets; fluctuation of prices, particularly during the harvest season; few agro-vets in the target location; and limited access to extension services.

#### ***Findings on cross-cutting Issues***

- **Gender dynamics:** The impact of climate change affected the two genders similarly, but also very differently, even when they lived in the same ecosystem. This called for some form of targeting in future interventions, to address the disparities.
- **The youth:** The attachment of the youth to farming as a means of livelihood was reducing very fast, and needed to be stopped. They no longer saw farming as a means to a livelihood, and had their eyes focused on obtaining formal employment in urban centres
- **Disability and inclusion:** Most farmers with physical impairments only were able to attend their farms routinely. The problem was farmers with other forms of disability like visual and mental impairments, who were totally dependent on their family members. Very few of them were registered with the National Council for Persons with Disabilities (NCPWD), and as such were not recipients of the national government financial assistance for persons with disability.
- **Insecurity:** Previously, resource-based conflicts were common in the target locations. However, continuous awareness creation on the need for peace, together with other peace-building efforts by the local administration, had reduced insecurity to be of limited concern in the target locations.
- **Human Rights:** There was little concern about human rights in the target location, as most people were aware about their rights and what to do whenever they were infringed upon.

#### ***Findings on Lessons Learnt***

- **The role of farmer groups:** Almost all farmers are members of a farmer groups, and accessing such farmers was thus best done through their groups. There is a need for continuous capacity building for such groups, to make them more efficient and effective to their members.
- **Rainwater harvesting:** The future of increased agricultural production through climate change adaptation in Tharaka North and South heavily depends on the uptake and effective employment of rainwater harvesting practices. The efforts of future interventions must be channeled towards this objective.
- **Farming Inputs:** There is a need for increased adaptation of farming inputs, for increased productivity. Unfortunately, most farmers cannot afford the required farming inputs, and some mitigation measures need to be taken.

#### ***Findings on further opportunities to explore***

- Introduce newer drought resistant seeds to the target communities, to keep up pace with research and new innovations.
- Link farmers with better markets with higher returns, and in the process eliminate middlemen and brokers, and enjoy the full benefits of their farming efforts.
- Expand and enhance the marketing abilities of farmer groups through enhanced capacity building in marketing for the already-established farmer groups.



- Enhance rainwater harvesting practices beyond what is currently being practiced. The farmers proposed the provision of bigger water tanks; the construction of individual water pans, besides the communal water pans, to ensure more water for irrigation for each household, and to ease pressure on communal water pans.
- The farmers emphasized the need for more farmer exchange visits and study tours, as it gave them an opportunity to witness how other farmers adapted to climate change and increased their agricultural productivity.

## Conclusion

The survey concluded that:

- The resilience of the target communities depended heavily on their uptake and sustenance of climate change adaptation practices, as their traditional approaches to farming and livelihoods generally were being threatened by the general impact of climate change. This called for concerted efforts to enhance awareness on climate change adaptation practices, and that farmers were practicing them in their routine activities.
- The practice of rainwater harvesting should be expanded and enhanced beyond what is currently being practiced. Access bigger water tanks that reserved more water; the construction and maintenance of individual water pans for each household, and the increased construction of communal water pans, will ensure adequate water for irrigation for each household, besides easing pressure on the communal water pans.
- Much as the seed varieties already in use in Tharaka North and South were drought resistant, there was still a need for the introduction of even newer drought resistant seeds to the target communities, and keep pace with research and new innovations.
- There is a need to enhance access to good markets with higher returns for the farmers, for them to enjoy the full benefits of their farming efforts.
- There is a need to enhance the marketing capability of farmers, beyond securing good markets for them.
- There is a need for more farmer exchange visits and study tours, as it gave them an opportunity to witness how other farmers adapted to climate change and increased their agricultural productivity.

## Recommendations

The recommendations of the study were for IAS Kenya to:

- i. Revise some of the output targets and make them realistic, since most of them have been surpassed by the baseline data
- ii. Introduce even newer drought-tolerant seeds into the target location, to keep up with the pace of the impact of climate change on agricultural production
- iii. Channel a lot of its efforts towards rainwater harvesting technology and management
- iv. Link farmers with new and better markets with higher returns.
- v. Channeled efforts towards enhancing the marketing skills and practices of the target communities.
- vi. Enhance rainwater harvesting practices beyond what is currently being practiced
- vii. Make adequate provision for farmer study tours and exchange visits.

## 1. INTRODUCTION

In the month of December, IAS Kenya commissioned a recall baseline survey of the enhanced climate change adaptation for improved agricultural production for 1090 farmers in Tharaka North and South by end of December 2023. This is a report of the subsequent survey that was conducted. The report starts with an introduction that lays out the background and context of the assignment; its goal and specific objectives to be achieved; the scope of content of the survey; and the key study issues that were addressed. This is followed by a detailed description of the methodology that was used by the survey before it presents and discusses the findings of the survey. The survey conclusion and recommendations appear at the end of the report.

### 1.1 About IAS Kenya

International Aid Services (IAS) Kenya is a Non - Governmental Organization registered as a local NGO in 2017 under the NGO Coordination Board in Kenya. IAS Kenya pursues the vision of “a World where Communities are empowered to Live Dignified Lives”, and a mission “seeking to empower communities through the promotion of access to education, sustainable livelihood, environmental stewardship and human rights”. IAS K works with partners in project implementation, hence is committed to developing organizational capacity and to support effective functioning and efficiency of its partners.

IAS Kenya has been actively involved in agriculture, disaster risk reduction and resilience programming in the semi-arid region of Tharaka for over 13 years. With remarkable progress and valuable lessons learned, the organization is now proposing a climate change adaptation approach to improve food security and livelihoods in the area. The aim is to empower the communities of Tharaka to adopt adaptive practices and enable IAS Kenya to establish a long-term partnership with the government and other stakeholders 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 piloting and capacity-building exercise for IAS Kenya and its partners to play a vital role in future climate change adaptation efforts

### 1.2 Background and Context

IAS K has been working to integrate resilience in their development work since 2019 and is now building on efforts complement existing government plans. Thus, this proposed intervention is in line with the Government of Kenya ASALs National Vision and Strategy: Vision 2030 Development for Northern Kenya and other Arid Lands. The Vision 2030 is the County's new development blueprint covering the period 2008-2030. It aims at making Kenya a newly industrialized middle-income country providing high quality life for all its citizens by the year 2030. The Vision is based on economic, social and political pillars. ASALs provide the framework for action for various stakeholders that will lead to sustainable development using the ASAL's natural resource base. Furthermore, Kenya's National adaptation plan 2015 - 2030 (NAP) outlines the Kenyan Government's ambitions for climate adaptation. It has the purpose of shaping a framework for coordinating and mainstreaming adaptation plans from the national to county level within respective development plans and budgets. This framework also serves as a streamlined

learning and monitoring channel meant to report on adaptation progress across all stakeholders within local government adaptation plans. 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 the selected target area and groups as the most underdeveloped locations in Tharaka Nithi County. The intervention will target 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 core target group will be composed of 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 group has previously been implementing resilience focused interventions with IAS K. However, this project seeks to fill in gaps that were identified through interaction and discussions with the communities, and the evaluation reports of given from previous interventions.

IAS Kenya has been engaged with extensive interventions, reviews, and consultations with the local communities in Tharaka where IAS K operates. The results of these have been documented well, and recommendations are given. However, IAS Kenya, together with local communities and partners, needs to be aligned with Government and local government policy and strategy. The purpose of this intervention is 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.

To be a relevant resource for the farmers, IAS K will, based on previous experience with implementation of disaster risk reduction and resilience programming, engage in an innovation in climate change adaptation approach together with vertical integration. In this short-term intervention, which serves as pilot for a larger intervention assumed when qualified further, a drought-tolerant seeds will replace previously failing seeds which will be introduced and a sustainable value chain of seed selection, conservation, and propagation. Other targets identified to be addressed include:

- 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 also 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

The intervention focuses on agriculture as the main sector/theme in addressing climate adaptation and water supply is a sub-sector.

### 1.3 Aim and Objectives of the Baseline Survey

The objective of this recall baseline survey was to capture data and information that will enable the project to establish the prevailing situation in the targeted villages and households prior to the project implementation. The outputs of the baseline survey would help to contextualise the real challenges faced by the beneficiaries, and provide information on the effects of climate change, identify the poorest and vulnerable groups, and provide an indication of the change in weather patterns that has impacted the communities.

To realise the stated purpose, the specific objectives of the survey were to:

- Improve the understanding of constraints and challenges faced by target participants, and their current state of needs
- Provide benchmarks of outcome level indicators against which future impact of program will be assessed
- Strengthen program monitoring by identifying lessons learned and evaluate the program through appropriate utilisation of baseline information.

### 1.4 Scope of Work

The geographic scope of the baseline study was limited to the villages of Chiakariga, Maragwa, Kanjoro, Kathangacini, and Kamanyaki of Tharaka North and Tharaka South Sub-Counties, of Tharaka Nithi County. The exercise engaged with relevant project stakeholders and ensured that their views and perspectives informed the evidence and learning that was generated.

On the other hand, the scope of content of the assignment was informed by the activities and indicators for the project objectives as outlined in the table below:

Outcomes	Outcome Indicators	Outputs	Output Indicators	Key questions to be asked
Outcome 1: Improved agricultural production introduced for 1090 farmers in Tharaka Nithi County through innovative	Majority of target farmers with increased adaptive capacity	Output 1.1 Increased adoption of drought-tolerant crops by 600 farmers in Tharaka North and South Sub Counties.	At least 30% of targeted farmers planting drought-tolerant crop varieties	- Do you plant drought tolerant crop varieties? - Which types of drought tolerant crops do you plant by these farmers, by farm size? - On the average, how much of each DTC do you harvest?
		Output 1.2: Increased animal	30% increase in adoption of	- Do you plant drought tolerant fodder (DTF)?

and enhanced and scalable climate change adaptation strategies by the end of December 2023"		production through the adoption of drought-tolerant fodder crops and pasture conservation by 600 farmers.	drought-tolerant fodder by farmers.	<ul style="list-style-type: none"> <li>- Which types of DTF do you plant, by farm size?</li> <li>- On the average, how much of the DTF do you harvest?</li> <li>- How many animals do you keep, by types?</li> <li>- What is the annual production rate of each type of animal that you keep?</li> </ul>
		Output 1.3 Develop and operationalize early warning for early action communication systems for agricultural purpose	At least 60% of farmers report on the availability and accessibility of relevant data and information for the early warning system.	<ul style="list-style-type: none"> <li>- Are you aware about any data &amp; information for early warning about disaster in your area?</li> <li>- If YES, how easy is it for you to get this information for early warning about disasters?</li> </ul>
		Output 1.4: Increased knowledge on water harvesting and set up rainwater harvesting technologies that withstand climate change for improved agricultural production.	15% of farmers adopt water harvesting technologies.	<ul style="list-style-type: none"> <li>- Are aware are you about water harvesting technology?</li> <li>- Do you practice water harvesting?</li> </ul>
Outcome 2. Enhanced knowledge and learning on climate change adaptation and optimized integration, coordination, and alignment	At least 90% of the secondary target group, staff and partners of IAS Kenya report on improved knowledge and learning	Output 2.1 Increased knowledge and effective project implementation of climate change adaptation by IAS Kenya and partners.	A least 90% staff and partners with improved knowledge on climate change adaptation.	<ul style="list-style-type: none"> <li>- As a <b>member of staff of IAS Kenya</b>, kindly rate your level of knowledge on climate change adaptation on a scale of 1 to 5, where 5 is the highest level</li> <li>- As a <b>partner of IAS Kenya</b>, kindly rate your level of knowledge on climate change adaptation on a scale of 1 to 5, where 5 is the highest level</li> </ul>
			Number of information-	<ul style="list-style-type: none"> <li>- How many information sharing sessions has IAS Kenya held with staff and partners?</li> </ul>

	on climate change adaptation		sharing sessions held	
50% of primary target group with improved knowledge and learning on climate change adaptation	Output 2.2: MEL on climate change adaptation	At least 25% of participants attended information-sharing events.	- Have you attended any information sharing sessions on climate change adaptation organized by IAS Kenya?	
	Output 2.3 Set up systems and partners that facilitate adaptation information and knowledge for IAS partners and local government policy makers	At least 10 policymakers and government officials engaged in information-sharing activities.	- As a policy maker, are you engaged in information sharing activities on climate change adaptation in this area? - As a government official, are you engaged in information sharing activities on climate change adaptation in this area?	
	Output 2.4: Advocacy and vertical integration	75% positive feedback from stakeholders on the effectiveness of information-sharing systems and activities.	- As a stakeholder, kindly rate the effectiveness of activities on climate change adaptation in this area - As a stakeholder, kindly rate the effectiveness of information sharing systems on climate change adaptation in this area& activities	
		At least 5 students provided with partial scholarship and started writing theses.	- As the implementing agency, how many students have been supported with partial scholarships? - How many of those students have started writing their thesis?	

Efforts were made to obtain data and information beyond the stated scope, to cover cross-cutting issues like youth and gender; inclusion; security; and human rights, among others.

## 2. LITERATURE REVIEW

This section presents a summary of information obtained from the review of available literature, to serve as a background to the study.

### 2.1 A Common Understanding of Key Concepts

The ideal starting point to this assignment was a look at some common concepts, and to explain how they will be used in the study.

#### 2.1.1 *Baseline surveys*

The most basic understanding of a baseline survey has it as a research or study that is conducted in order to assess the situation prior to the start of a project. The survey can be conducted right before the project commences or immediately at the beginning of the project (MEAE, 2023).

#### 2.1.2 *Recall baseline*

Though uncommon, recall baseline is known and well documented by scholars. When confronted with conducting an evaluation for a project that's already been implemented, but which has no (pre-project) baseline data, evaluators are known to sometimes ask survey respondents to recall information about the situation they were living in at a point in time before the project began, and assess what changes have happened since. This approach has been endorsed by organisations such as the Organisation for Economic Co-operation and Development (OECD); the International Fund for Agricultural Development (IFAD); and the International Federation of Red Cross and Red Crescent Societies (ICRCS) (Fuller, 2023).

#### 2.1.3 *Climate change*

Climate change is the significant variation of average weather conditions becoming, for example, warmer, wetter, or drier—over several decades or longer. It is the longer-term trend that differentiates climate change from natural weather variability (World Bank, 2023).

#### 2.1.4 *Climate change adaptation*

Climate change adaptation means altering our behavior, systems, and—in some cases—ways of life to protect our families, our economies, and the environment in which we live from the impacts of climate change (WWF, 2023).

### 2.1.5 Vulnerability

Vulnerable populations definition: Groups who are at a disadvantage because of an inherent quality they possess or a status they occupy. Groups considered vulnerable can change depending on the context. Among vulnerable groups in society include elderly people, people with low incomes, and children (McQueen, 2022).

## 2.2 Tharaka Nithi County

### 2.2.1 Overview

Tharaka Nithi County is a semi-arid area in the Eastern side of Central Kenya with a trend of becoming highly vulnerable to adverse impacts of climate change.

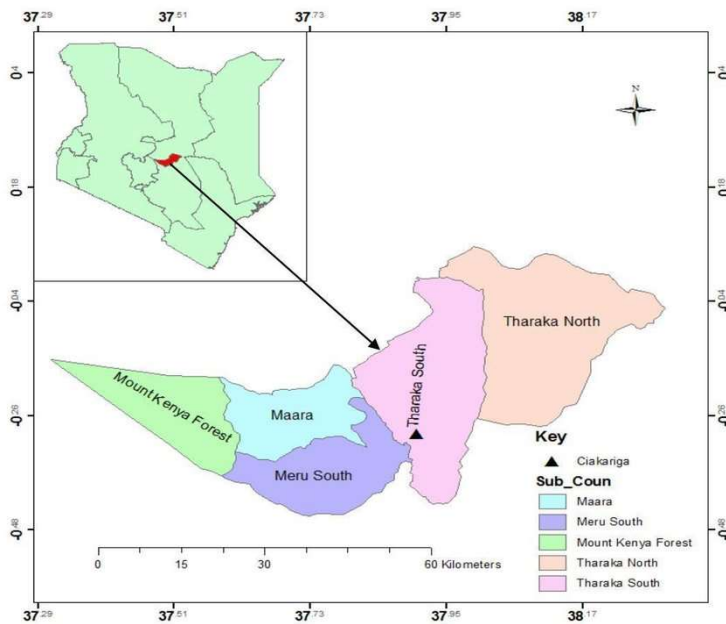


Figure 1 – Map showing Tharaka North and South Sub Counties

The area is classified as a water scarce region with less than 650mm<sup>3</sup> of freshwater per capita. A greater part of Tharaka Nithi County is classified as Arid and Semi-Arid Lands (ASALs). ASALs are generally marked by low human development, high levels of poverty, low literacy, low



population density, poor infrastructure, unreliable rainfall patterns and recurrent droughts. Climate-related shocks and stresses, especially recurrent drought significantly undermine food security and livelihood and other aspects of community life of a large section of community system in Tharaka including health, education, economy, social cohesion, and unity, among others. And the findings of IAS Kenya are supported by many sources.

Local communities in Tharaka Nithi County experience a wide variety of climate-related shocks and stresses including hunger and famine due to crop failure, loss of livestock, water shortage, and outbreak of human diseases such as cholera. There is evidence of poor farming methods that lead to decline in land productivity, such as slash and burn cultivation methods, overgrazing, and charcoal burning leading to destruction of vegetation cover, uncontrolled soil erosion, and deep gullies. The long-term exposure to environmental degradation, increasing incidences of climate-related stresses and shocks, coupled with accelerated aridity of the land, reduced land sizes, and land degradation, has had a combined effect of eroding the livelihood of the people of Tharaka Nithi County and exposing them to food insecurity, poverty, and morbidity among other vulnerabilities.

#### **2.2.2 Risk Profile**

According to the climate risk country profile report by the World Bank, Kenya is highly exposed to many natural hazards, most commonly floods and droughts. It is estimated that over 70% of natural disasters in Kenya are attributable to extreme climatic events. Typically, major droughts occur approximately every ten years and moderate droughts or floods every three to four years. Repeating patterns of floods and droughts in the country have had large socio-economic impacts and high economic costs. For example, the 1998 to 2000 drought cost an estimated \$2.8 billion, principally due to crop and livestock loss, as well as forest fires, damage to fisheries, reduced hydropower generation, reduced industrial production, and reduced water supplies. Droughts have affected more people and had the greatest economic impact (8% of GDP every five years). As many as 28 droughts have been recorded in the past 100 years, and these appear to be increasing in frequency, why scientist claim climate change as the main contributing factor. Droughts are often nationwide but have the most severe impacts in the country's highly arid zones. Drought also remains a significant concern to Kenya's agricultural sector. Arid and semi-arid areas comprise 18 or the 20 poorest counties and are particularly at risk from increased aridity and periods of drought. Kenya's arid and semi-arid lands cover 48 million hectares or with approximately 80% of the country's total land surface. Of this, 9.6 million hectares support marginal agriculture, and almost 15 million hectares are suitable for largely sedentary livestock production.

According to the Tharaka Nithi Climate Risk profile report, over 40% of the county's population lives below the poverty level (<\$1 a day) and have challenges accessing necessities like food, clothing, and decent shelter. This is attributed to lack of resources to invest in the other sectors that can enhance their income generating capacity, poor infrastructure, low food productivity, and adverse climatic conditions. Tharaka Nithi County's vulnerability to hazards occasionally results in crop failure and reduction in pasture availability, particularly when short and inadequate rainfall is followed by prolonged droughts.

### **2.2.3 Agriculture and Food Production in Tharaka Nithi County**

Agriculture is the main source of food and livelihood in the semi-arid Tharaka Nithi County. It is therefore a primary source of income for most households in the county. Approximately 80% of the population are subsistence farmers, focusing on crop and livestock production. Crop production is the main economic activity in the mixed farming and rain-fed cropping livelihood zones contributing to about 70% of household income which is rarely achieved due to unreliable rainfall in the area. Livestock diseases and acute water shortages continue to pose a great challenge to the resilience of the communities. According to the NDMA, both the long and short rains have been erratic in the recent past, and become more unpredictable because of climate change. This calls for communities to be more adaptive if they are to survive. Since 2019, the area has received inadequate rainfall, and this has affected crop and livestock production, which led to most farmers replanting two to three times hoping for a better plant yield.

## **2.3 The Effects of Climate Change in the Target Locations**

Tharaka Nithi County has not been spared from the global impact of climate change. Analysis of historical climate data shows a decline in rainfall, especially in the long rains season since the 1970s, alongside an increase in temperature. These factors have reduced water availability in the county and constrained agricultural production, and crop failure can at times be up to 100 percent. or instance, in 2013, farmers

especially in the marginal mixed farming zone lost their entire crop<sup>4</sup>. Such an event usually leads to high food prices, rendering many households in the county food insecure. Food aid or relief is a common intervention in the county; for instance, in 2013, more than a quarter of the schools were under school meals programmes. In addition, in response to the negative impacts of climate anomalies, several interventions including irrigation projects and seed distribution programmes among others have been implemented in the county. However, the scale of intervention and adoption is low, and the effects of unpredictable weather are still rampant owing to an array of institutional, political, and socio-economic challenges (MoALF, 2017).

## **2.4 Existing Climate Change Adaptation Practices**

Some of the adaptation strategies Tharaka Nithi farmers are using to cope with climate change and variation are specific to certain value chains whereas others cut across value chains. For crop farmers, these include improved drought-resistant crop varieties, fast-growing and early-maturing crop varieties and rainwater harvesting, conservation agriculture, crop rotation and intercropping, afforestation, and irrigation. For livestock keepers, these include fodder conservation, rearing improved breeds, and vaccination of livestock. Women are more likely to adopt strategies aimed at diversifying production and post-harvest value-added activities such as food storage facilities and tree planting compared to men who engage mainly in farming and livestock keeping (ibid).

Farmers adapt to climate change and variability in a number of ways. On-farm interventions in Tharaka Nithi County are mostly geared towards methods of harvesting or conserving water to boost crop production and improve pastures. Households employ a number of strategies to adapt to climate change including soil and water conservation; planting of trees; diversification into other agricultural activities; changed livestock enterprises; training on soil and water conservation; changing of crop type; and staggered cropping (GoK, 2014)

### **3. METHODOLOGY**

The methodology was purposed to allow for a recall period of 2 to 5 years, against the prevailing status, and provide data on tendencies experienced by the target groups regarding the consequences of climate change. Following are a few of the key methods that proved crucial to the study.

#### **3.1 Desk Review**

A desk review of the relevant project documents started off the survey process, informed by the scholarly opinion that before carrying out a field visit, it makes sense to see what people have done in the past that relates to it. Although it is unlikely that anyone has carried out the exact research activity you are planning to undertake, someone has almost certainly tried to answer related questions. Reviewing this research is the quickest and cheapest way to understand the study background (Travis, 2016). Among the documents reviewed included the project proposal document; the log frame; and the seed value chain analysis report that was conducted for the same area. These documents offered an insight into the project background, context, and planned activities, and allowed for the obtaining of information on the target population and project beneficiaries.

#### **3.2 Identification of Study Population**

The population of interest for this study was identified as the farmers in the targeted project locations in Tharaka North and South sub counties. The target beneficiary base was established to be 1090 farmers, and they formed the primary study population group, defined as a group of individuals selected on the basis of inclusion and exclusion criteria which relate to the variables being studied. It is the population from which the sample population will be randomly or purposively selected (Definitions.net, 2021). It is from this study population that the study sample was drawn.

#### **3.3 Study Sampling**

In research studies, it is often not feasible to recruit the entire population of interest, therefore the study only focused on a sample from the population of interest to engage with (Majid, 2018). Similarly, a good maximum sample size is usually around 10% of the study population, as long as this does not exceed 1000 (Tools4Dev, 2020). This too informed the study sampling process.

The study adopted *Slovin's Formula* for the calculation of the study sample. In this formula,  $n = N/(1+Ne^2)$ , where  $n$  is the sample size,  $N$  is the population size, and  $e$  is the margin of error to be decided by the researcher (Castillo, 2016). The study adopted 8% error margin, informed by an opinion that an acceptable margin of error used by most survey researchers typically falls between 4% and 8% at the 95% confidence level (Pollfish, 2021). Based on Slovin's Formula of  $n = N/(1+Ne^2)$ , the ideal sample size for this study was calculated to be at least 137 respondents, as shown in the table below.

Table 2 – Calculation process of the study sample	
Item	Number
Formula	$n = N/(1+Ne^2)$
Target Population	1,090
N = Population	1,090
e = error margin of 8% (at 90% confidence level)	0.08
$e*e$	0.0064
$N*e*e$	7
$(1+Ne^2)$	8
$n = N/(1+Ne^2)$	137
<b>Total</b>	<b>137</b>

However, and in line with the terms of reference for this assignment, the study was expected to go beyond the ideal number and engage with 15% of the target study population as the core group, and a similar number as control group. This distribution is presented in the section that follows.

### 3.4 Sample Targeting

Conscious efforts were made to identify a sample that was representative of the target community, factoring in gender and special groups among the study sample, namely women, the youth, and persons with disabilities. Similarly, in arriving at the representative sample for persons with disabilities, the study relied heavily on data from the 2019 national population census that holds that 2.2% (0.9 million people) of Kenyans live with some form of disability (Development Initiatives, 2020). This was adopted by the study and used to work out the representative population of persons with disabilities. The table below presents the distribution of the target study sample by respondent groups and other related parameters.

Table 3 – Study sample size and distribution

Respondent Group	Sample Size	Distribution by:					
	TOTAL	Sub-County		Study Role		Youth	Disability
		North	South	Core	Control		
Male farmers	148	89	59	74	74	5	2
Female farmers	180	108	72	90	90	5	2
	328	197	131	164	164	10	4

### 3.5 Key informant interviews (KII)

The key informant interview method was crucial to this study and is worth a mention. Key informants are knowledgeable individuals who contribute a perspective on a research phenomenon or situation that the researchers themselves lack. They provide information about, and contribute to expanding a researcher's understanding and precise insights and help to reduce potential bias (Cossham & Johanson, 2019). The study adopted this scholarly opinion to use KII to obtain information from strategically placed stakeholders with unique information arising from their equally unique positions in the target communities. The table below gives a list of the key informants that were of interest to this study.

Table 4 – Key informants

Respondent Group	Sample Size	Distribution by Sub- County	
		Tharaka North	Tharaka South
Community Water Management Committee	2	1	1
County officers for NEMA	2	1	1
County officers for LIVESTOCK	2	1	1
County officers for AGRICULTURE	2	1	1
County officers for WATER	2	1	1
Local administrations	2	1	1
IAS Partners	4	2	2
IAS Staff	4	0	0
<b>TOTAL</b>	<b>20</b>	<b>8</b>	<b>8</b>

### 3.6 Focus Group Discussions (FGD)

The focus group discussions (FGD) method was used during this survey. This was a vital information collection method for the study, which benefited from several of its known advantages

including participants being able to “feed off each other” as they respond to each other’s comments. Participants can also support or disagree with one another, creating more energy and thus more data. Getting at perceptions, attitudes, and experiences more than a quantitative survey (SIS International, 2021). This method allowed for the cross-checking of obtained information against those obtained from smaller cohorts of the same target groups.

### **3.7 Mixed Methods**

The study used the mixed method approach as the primary data collection method for engaging with the primary respondents. This entailed the use of both qualitative and quantitative data and information collection methods, particularly to triangulate information collected from secondary sources, and FGD sessions, for verification and accuracy. Combining the two methods (often referred to as mixed methods research) can greatly improve the quality and accuracy of findings, adding both breadth and depth. Among the advantages of combining the methods include identifying issues or obtain information on variables not found in quantitative surveys; examining or generating hypotheses from qualitative research that can be tested by taking a quantitative approach; and explaining or using qualitative data to better understand unexpected results from quantitative data (Mander, 2017). The following sub-methods were key to the proposed mixed methods.

#### **3.8.1 Checklists and Questionnaires**

These were used both for the survey as well as interviews with targeted respondents to identify issues and or obtain information on variables not found in quantitative surveys.

#### **3.8.2 Survey**

This was conducted to obtain qualitative and quantitative information from the targeted farmers. The method allowed for the collection of information on the effects of climate change in the target locations; to obtain information on the poorest and vulnerable groups to be targeted; and to provide an indication of how the change in weather patterns has impacted the communities, among other things.

#### **3.8.3 Mobile Data Collection (MDC)**

The survey used the mobile data collection method (MDC) as the primary survey data collection methodology. MDC is known for its speed, convenience, and accuracy. Features of mobile data collection, such as decision support, form logic, and checklists, improve the quality of the data collected, while also ensuring adherence to data collection and care protocols (Dmagi.com, 2021). The survey used the method to collect in-the-moment or close-to-the-moment active data, and passive data, directly from people in their daily lives (Seifert, Hofer & Allemand, 2018). In this regard, the **Kobo Collect** software application was used for data collection at the household level. Among the known advantages of this data collection software application include doing away with paper questionnaires, and the ease to use it; the security and convenient storage of collected data; its ability to process large data and information.

### **3.8 Data and Information Analysis**

The survey employed scientifically accepted data analysis techniques including comparative analysis, causal effect analysis, and stakeholder analysis, among others. The analysis also triangulated primary data with various sources and methodologies, and cross-checked with secondary data, to establish consistency. In doing this, the survey used Microsoft Excel, MS Excel is suitable to manipulate, manage and analyze data, and in the process assist in decision-making and creating analysis efficiencies. Among its advantages include its ease and effectiveness in comparisons; the ability to analyze large amounts of data to discover trends and patterns that will influence decisions; and graphing capabilities that allows summarizing and organizing of data (Cook, 2021).

3.9 Respondent Information

From the analysis of available data, it emerged that the survey managed to engage with a total of 296 respondents against a target of 328. Following is a summary of information about the respondents, presented by the different targeted parameters.

Commented [EJ1]: Why was it not possible to reach the target population?

3.9.1 Respondent distribution by role and sub-county

The first parameter of interest was the distribution of beneficiaries by the different sub-counties, and the table below captures this information.

Table 5 – Respondent distribution by role and sub-county						
Sub-County	Core Group		Control Group		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Tharaka North	128	71.5	51	28.5	179	60.5
Tharaka South	54	46.2	63	53.8	117	39.5
Grand Total	182	61.5	114	38.5	296	100

The table shows that Tharaka North contributed 60.5% (or 179) of the respondents compared to Tharaka South which contributed 39.5% (or 117) of the respondents. This distribution was normal, given that 3 (three) target sub-locations were in Tharaka North, as opposed to 2 (two) in Tharaka South.

3.9.2 Respondent distribution by gender

IN analyzing the distribution by gender, it emerged that 57.1% (or 169) of the 296 respondents were male, as opposed to 42.9% (or 127) who were female, as shown in the table below.

Table 6 – Respondent distribution by gender						
Gender	Core Group		Control Group		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Male	95	56.2	74	43.8	169	57.1

Female	87	68.5	40	31.5	127	42.9
<b>Grand Total</b>	<b>182</b>	<b>61.5</b>	<b>114</b>	<b>38.5</b>	<b>296</b>	<b>100.0</b>

Given the standard requirement of targeting not more than 2/3 (in this case, 197) from one gender, the above distribution passed the gender test. The impact of this finding is that the resultant findings of the survey will be fairly representative of the genders, and a mirror of the actual gender distribution of the respondent communities.

### 3.9.3 Respondent distribution by household size

It was important for this survey to establish the distribution of respondents by household size as well. Given that Tharaka Nithi is a hardship area, the dynamics of feeding a family of 2 (two) will be very different from those of a family of 6 (six). The table below presents findings in this regard.

The table shows that the most common family size was 5 to 6 people, as was represented by 38.51% (or 114) of the 296 respondents. This was followed by families of between 7 and 8 people, represented by 26.69% (or 79) of the respondents. On the other end, it was evident that very large family sizes were not common, with only 7.77% (or 23) of the respondents reporting having family sizes off between 9 and 10 people, and another 1.69% (or 5) of the 296 respondents reporting having family sizes of more than 11 people.

<i>Table 7 – Respondent distribution by HH size</i>						
	Core Group		Control Group		Total	
Household size	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
5 to 6	75	41.20%	39	34.20%	114	38.51
7 to 8	49	26.90%	30	26.30%	79	26.69
2 to 4	45	24.70%	30	26.30%	75	25.34
9 to 10	10	5.50%	13	11.40%	23	7.77
11+	3	1.70%	2	1.80%	5	1.69
<b>Grand Total</b>	<b>182</b>	<b>100%</b>	<b>114</b>	<b>100</b>	<b>296</b>	<b>100.00</b>

It was therefore possible to deduce that there may be a connection between smaller family sizes and the impact of climate change among the target population. However, further and more targeted studies may be required in future to establish this as a fact, together with the factors influencing this phenomenon.

### 3.9.4 Respondent distribution by disability

Conscious efforts were made to include persons with disability in the survey, and ensure that their opinions were also included in the survey. The table below captures the distribution of respondents by disability.



Table 8 – Respondent distribution by disability						
	Core Group		Control Group		Total	
Disability	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
No	174	95.6%	104	91.2%	278	93.9
Yes	8	4.4%	10	8.8%	18	6.1
<b>Grand Total</b>	<b>182</b>	<b>100.0%</b>	<b>114</b>	<b>100.00%</b>	<b>296</b>	<b>100.0</b>

The table shows that 6.1% (or 18) of the 296 respondents were persons with disability, against a target of only 10. The significance of this finding was that the opinions of persons with disability were captured by the survey, making the subsequent findings inclusive as well as representative.

It was from engagements with the above respondent groups that the survey put together the findings discussed in the section that follows.

## 4. PRESENTATION AND DISCUSSION OF FINDINGS

This section is a presentation and discussion of the findings of the survey. In line with the terms of reference for the assignment, the section starts by looking at the status of the outcome-level indicators. This is followed by a discussion of the constraints and challenges faced by the targeted farmers, and a discussion of a number of cross-cutting issues, and how they impacted on the lives of the targeted farmers. The survey then looks at a number of lessons learnt, before ending with a discussion of further opportunities to explore.

### 4.1 Findings on Project Indicators

The purpose of this effort was to provide benchmarks of outcome level indicators against which future impact of program will be assessed. Details of findings on baseline indicators appear as an annex to this report (*Annex 4 – Log-frame Attainment Matrix*). Following is a discussion of the same findings beyond the baseline data.

#### 4.1.1 The number of farmers growing drought-tolerant crops

First to be looked at was the number of respondents who were growing drought-tolerant crops, and this question was posed to 182 respondents from the core group, and 114 respondents from the control group, to determine their position. The figure below is a summary of the findings in this regard.

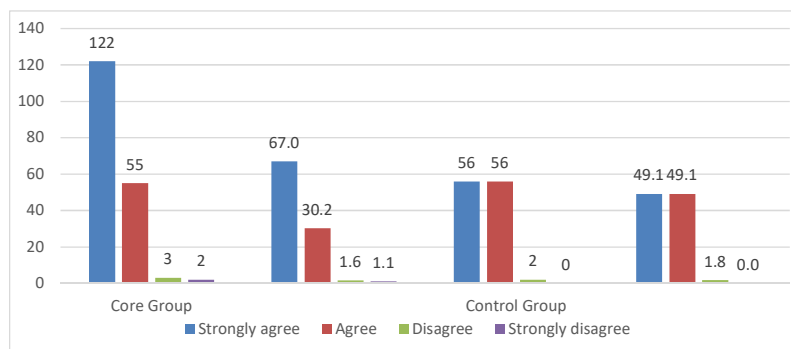


Figure 2 – Respondents on planting drought-tolerant seeds

The figure shows that from the core group, a total of 177 (or 97.2%) of the 182 respondents were in some form of agreement that they planted drought-tolerant crops, with only 5 (or 2.7%) reporting not planting drought-tolerant seeds. From the control group, a total of 112 (or 98.2%) of the 114 respondents reported planting drought-tolerant seeds as opposed to only 2 (or 1.8%) who did not. By working out the average of the above responses, the survey established that the benchmark to be used for the number of people planting drought-tolerant seeds will be 97.6% of the target population.

The same respondents were asked to name the drought-tolerant seeds that they grew from where it emerged that millet, green grams, cow peas, sorghum, pigeon peas, and a little maize were the most commonly grown seeds.

In further analysis of feedback from the same respondents, it was established that most of the farmers grew drought-tolerant crops in farm sizes of 2 acres and above. This was reported by 78.6% (or 143) of the 182 core group respondents, and 63.98% (or 73) of the 114 control group respondents, for an average of 73% (or 216) of the 296 respondents.

#### 4.1.2 The number of farmers who have adopted drought-tolerant fodder

Next to be examined was the number of farmers who have adopted drought-tolerant fodder, to act as a benchmark towards the achievement of the project target of 30% increase. Questions were put to both respondent groups and their responses captured in the table below.

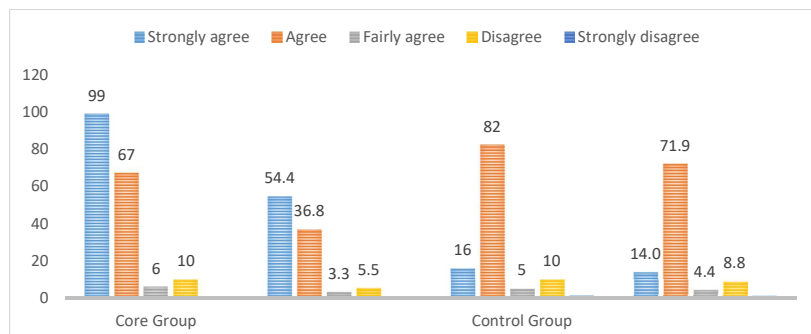


Figure 3 – Respondents on growing drought-tolerant fodder

The table shows that a combined total of 172 (or 94.5%) of the core group were in agreement with the statement that they were growing drought-tolerant fodder. Similarly, 103 (or 90.3%) of the control group were growing drought tolerant fodder. This came to a total of 275 (or 92.9%) of the 296 respondents growing drought-tolerant fodder, which will be used as the baseline for this indicator. Asked further questions in a different session to identify the drought-tolerant fodder that most farmers grew, the most common response was *Napier grass*. This highlighted the need to introduce new or other varieties of drought-tolerant fodder to this community. Given how they always struggled to get food for their livestock, particularly in the years of disasters, this should be a very receptive community to uptake and sustain new fodder varieties introduced to them.

#### 4.1.3 Farmers reporting on the availability and accessibility of relevant data and information for the early warning system

The third indicator to be looked at was on the availability and accessibility to farmers of relevant data and information for the early warning system. This question was posed to the two groups of respondents, and their responses plotted in the figure below.

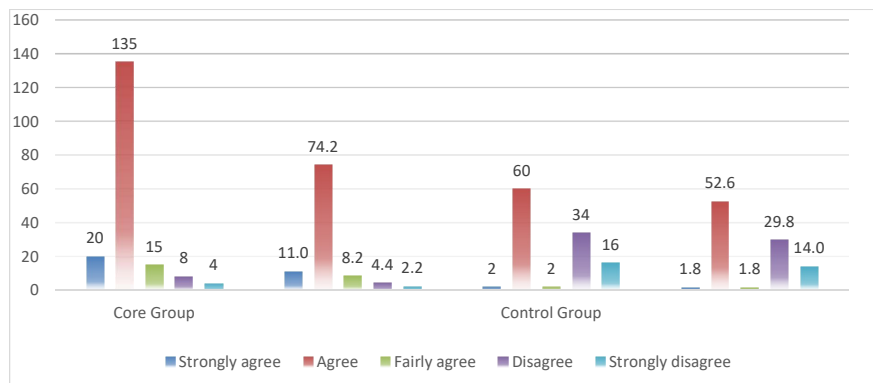


Figure 4 – Availability and accessibility of relevant data and information for the early warning system

From the core group, the figure shows that a combined total of 170 (or 93.4%) of the 182 respondents concurred that relevant data and information for early warning system was available and accessible to them, against a total of only 12 (or 6.6%) who reported in the negative. Elsewhere, a total of 56.1% (or 64) of the 114 respondents from the control group reported that relevant data and information for early warning system was available and accessible to them, against a total of only 50 (or 43.8%) who posted a contrary response. By working the average of these responses, the survey arrived at 79.1% as the baseline data for this indicator

#### 4.1.4 Farmers adopting water harvesting technologies

The next indicator of interest to the study was on the number of farmers adopting water harvesting technologies. Questions in this regard were posed to the two groups of respondents, from where the following analysis was done to reveal the situation on the ground.

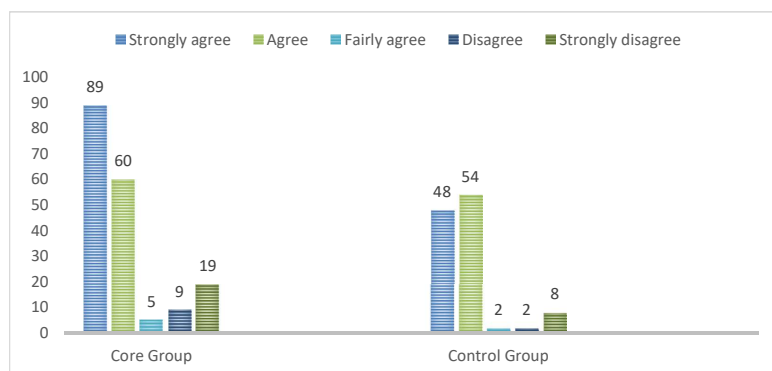


Figure 5 – Farmers adopting water harvesting technologies

It was possible to conclude from the figure that a total of 154 (or 84.6%) of the 182 core group respondents were already practicing water harvesting technologies as opposed to 28 (or 15.4%) who did not. From the control group, a total of 104 (or 91.2%) of the 114 respondents were practicing water harvesting, against only 10 (or 8.8%) who did not, for a combined total of 258 (or 87.2%) of the 296 respondents already practicing rainwater harvesting. This was established as the baseline data for this indicator.

#### **4.1.5 Staff and partners with improved knowledge on climate change adaptation**

The survey engaged with IAS Kenya staff and established that all the seven (7) field staff had gone through many trainings and capacity building on climate change adaptation, and as such were conversant with the concept. However, they welcomed any new information on climate change adaptation, and expressed their desire to participate in any organised capacity building for the same.

From engagements with IAS Kenya, the survey also established that for this project, IAS Kenya was in partnership with Tharaka University; Tharaka Vocational and Training College; Tegemeo – CBO; and Kenya Water Institute (KeWI). It was reported that all the partners had participated in the awareness creation initiatives by this project, targeting climate change adaptation, and as such the baseline data for this indicator stood at 100%

#### **4.1.6 Number of information-sharing sessions held**

This indicator was dependent on the activities carried out by the project and the number of information-sharing sessions held. Since this was a baseline survey for the project, coming prior to the activities, the survey deemed it appropriate to use zero (0) as the baseline data for this indicator. The survey, however, established that a number of information sharing sessions, organized by other projects, had been held in the target location, even though the exact numbers could not be determined.

#### **4.1.7 Participants attended information-sharing events**

Just as with the previous indicator, this indicator was also dependent on the activities carried out by the project in 4.1.6 above, and the subsequent number of participants in attendance. As such, its baseline data was set at zero (0). However, the survey established that most of the farmers had attended a number of information-sharing events in the area, as shown in the table below.

<i>Table 9 – Farmers who have attended information-sharing events</i>				
	<b>Core Group</b>		<b>Control Group</b>	
	<b>Frequency</b>	<b>Percentage</b>	<b>Frequency</b>	<b>Percentage</b>
Strongly agree	106	58.2	3	2.6
Agree	65	35.7	37	32.5
Fairly agree	2	1.1	0	0.0

<b>Total</b>	<b>173</b>	<b>95.05</b>	<b>40</b>	<b>35.09</b>
Disagree	8	4.4	59	51.8
Strongly disagree	1	0.6	15	13.2
<b>Total</b>	<b>9</b>	<b>4.95</b>	<b>74</b>	<b>64.91</b>
	<b>182</b>	<b>100</b>	<b>114</b>	<b>100</b>

This table shows a very interesting respondent distribution between the core group and the control group, on a number of the parameters. In the previous questions, the responses from the core group were largely similar to those of the control group. In this case, however, the combined total from the core group, for those who agreed to having attended information-sharing sessions, was 95.05% (or 173) of the 182 respondents in this group. Yet from the control group, only 35.09% (or 40) of the 114 respondents agreed to having attended information sharing sessions. This was later clarified during group discussion sessions, where participants explained that 5 years ago, climate change adaptation activities were not as active as they were in 2023, so it was normal for fewer of the control groups to have attended information-sharing sessions.

#### **4.1.8 Policymakers and government officials engaged in information-sharing activities**

The baseline data for this indicator was set at zero (0) since the project was yet to undertake the activity. However, the survey established that policy-makers and government officials were continuously engaged in information-sharing activities in the target location to enhance awareness on climate change adaptation.

#### **4.1.9 Positive feedback from stakeholders on the effectiveness of information-sharing systems and activities**

The baseline data for this indicator was also set at zero (0), to reflect the fact that the project was yet to implement activities from where stakeholders could assess the effectiveness of the related efforts. However, the survey went beyond this project to determine the effectiveness of the existing information-sharing systems and activities, and posed related questions to farmers, from where the following responses were captured.

<i>Table 10 – Feedback on the effectiveness of information-sharing systems</i>				
	<b>Core Group</b>		<b>Control Group</b>	
	<b>Frequency</b>	<b>Percentage</b>	<b>Frequency</b>	<b>Percentage</b>
Strongly agree	103	56.6	6	5.3
Agree	55	30.2	47	41.2
Fairly agree	21	11.5	22	19.3
<b>Total</b>	<b>179</b>	<b>98.35</b>	<b>75</b>	<b>65.79</b>
Disagree	2	1.1	24	21.1
Strongly disagree	1	0.6	15	13.2

<b>Total</b>	<b>3</b>	<b>1.65</b>	<b>39</b>	<b>34.21</b>
	<b>182</b>	<b>100</b>	<b>114</b>	<b>100</b>

The table shows that over 98% (or 179) of the 182 core group respondents agreed that the existing information-sharing systems and activities were effective, as opposed to only 3 (or 1.65%) who thought otherwise. Similarly, 65.79% (or 75) of the 114 control group respondents felt that the existing information-sharing systems and activities were effective, against 34.21% (or 39) who held a contrary opinion. On the whole, the survey established that the existing information-sharing systems and activities in the target location were effective, with over 85% (or 254) of the 296 respondents supporting this position.

In extended discussions with the respondents on the same subject, the survey established that the existing information-sharing systems included radio messaging, that was easy to package and whose reach was also very wide. They identified mobile phone short messaging service (SMS) as another system that was used, especially for early warning on expected disasters. Posters and flyers, targeting the literate section of the population, were also used for information dissemination. There was information-sharing at the Chief's baraza, and in churches, both of which had been used for many years, and whose effectiveness was never in doubt. This was followed by *word-of-mouth* system, where information was passed verbally from one person to the next.

#### 4.1.10 Students provided with partial scholarship and started writing theses

This project was designed to support 5 students undertaking their studies at Tharaka University. Four (4) of the students were undertaking their master's course while one (1) was pursuing a PhD degree. From engagements with IAS Kenya staff, it was established that all the 5 students had received their partial scholarship from the project, had commenced their studies and writing their theses, and had recently shared a status update of their studies with IAS staff

## 4.2 Findings on Constraints and Challenges faced by Farmers

The survey engaged at length with farmers, through general as well as focused group discussion sessions, to establish the real constraints and challenges they faced. To obtain a different view on the same subject, the survey also engaged with different county and national offices providing support services to farmers. Following is a tabulated summary of some of the real challenges and constraints that were identified.

<i>Table 11 – A summary of constraints and challenges faced by farmers</i>	
<b>Challenges</b>	<b>Proposed Mitigation</b>
Food shortages, especially during disasters	<ul style="list-style-type: none"> <li>• <i>The need for food reserve facilities within the target locations</i></li> <li>• <i>Should be a joint effort between the county government and national agencies dealing with disasters (NDMA)</i></li> </ul>
Loss of lives during disasters	<ul style="list-style-type: none"> <li>• <i>Enhanced disaster awareness and preparedness</i></li> </ul>

Loss of livelihood assets like crops in the field, and livestock, during disasters	<ul style="list-style-type: none"> <li>• <i>Timely support from county and national governments</i></li> <li>• <i>Enhanced disaster awareness and preparedness</i></li> <li>• <i>Maintain effective early warning systems</i></li> <li>• <i>Introduce agricultural and livestock insurance for farmers</i></li> </ul>
Water for domestic as well as agricultural use	<ul style="list-style-type: none"> <li>• <i>Enhanced access to water tanks for rainwater harvesting</i></li> <li>• <i>Construction of individual water pans, to augment new and existing communal water pans</i></li> </ul>
Poor access to farming inputs	<ul style="list-style-type: none"> <li>• <i>Enhance awareness on availability of farming inputs</i></li> <li>• <i>Loan schemes should be arranged with their farmer groups, to be paid back with produce after harvest</i></li> <li>• <i>Direct request for support from county government and other development agencies</i></li> </ul>
Constrained access to certified seed varieties	<ul style="list-style-type: none"> <li>• <i>Enhance awareness on sources of certified seeds</i></li> <li>• <i>Promote loan schemes with their farmer groups, to be paid back with produce after harvest</i></li> <li>• <i>Request for support from county government and other development agencies</i></li> </ul>
Poor harvest which cannot sustain household livelihoods	<ul style="list-style-type: none"> <li>• <i>The need for a faster uptake of climate change adaptation strategies</i></li> <li>• <i>Improved agricultural productivity</i></li> </ul>
Middlemen, and the suppression of farm-gate prices	<ul style="list-style-type: none"> <li>• <i>Promote the establishment of farmer marketing groups, to cut out the middlemen in the sale of farm produce</i></li> </ul>
Fluctuation of prices	<ul style="list-style-type: none"> <li>• <i>Work with the county government to come up with modalities for stabilizing prices, particularly during harvesting</i></li> </ul>
Access to transport to better but distant markets	<ul style="list-style-type: none"> <li>• <i>Farmer groups should organize themselves and purchase transport for their respective farmer groups</i></li> </ul>
Soil erosion, and the loss of farming lands	<ul style="list-style-type: none"> <li>• <i>Soil erosion mitigation measures like the construction of preventive gabions</i></li> <li>• <i>Enhanced tree planting and reduction in cutting trees, as a long-term mitigation measure</i></li> </ul>
Few agro-vets	<ul style="list-style-type: none"> <li>• <i>Engage with the professional body of agro-vets to address this matter</i></li> <li>• <i>County government to induce agro-vets to set up shop in the target locations</i></li> </ul>
Limited access to extension services	<ul style="list-style-type: none"> <li>• <i>Engage with the county government to re-introduce this crucial service to farmers</i></li> <li>• <i>Where necessary, the county government should train and deploy such officers to areas with the greatest need</i></li> </ul>

### 4.3 Findings on Cross-cutting Issues

A number of cross-cutting issues emerged in the course of the survey, a few of which are discussed below.

#### 4.3.1 Gender Dynamics

The survey established that the impact of climate change affected the two genders very differently, much as they lived in the same ecosystem. This called for some form of targeting in future interventions, to address the disparities. During a focus group discussion session with farmers, it



was agreed upon that farm work was done by all family members regardless of the genders. Afterwards, female farmers then had to worry about where to get food and water for the entire family, and where to get firewood. In the dry seasons when these commodities were all scarce, female farmers had little peace of mind when they went to sleep, after a long day of searching for the same. Male farmers who were largely responsible for family livestock, also had to worry about where to get food or fodder for the livestock. They also bore the bigger brunt whenever resource-based conflicts erupted, and were more likely to be killed or injured during such outbreaks. To this extent it was established that the impact of climate change affected the two genders both similarly as well as differently.

#### **4.3.2 The Youth**

The survey established a growing phenomenon among the youth where their attachment to farming as a means of livelihood was reducing very fast. During a group discussion with a mixed group of farmers, parent farmers complained that most of their children did farm work under duress, and would never show up at the farms if they had a choice. The youths, who were ably represented at the group discussion, concurred with the parent farmers, stating that they saw their own parents struggling to feed, educate, and provide medical and other needs for their families through farming, and they did not want that cycle to repeat when they were finally parents. All the youths at the meeting were unanimous that they would leave the village to look for employment in urban places if they had an opportunity to do so. The discussion ended on a stalemate when parent farmers reminded the youth about the scarcity of jobs in urban centres, and the need for the youth to come up with innovative ways of generating income from the very many farming options available to them.

#### **4.3.3 Disability and Inclusion**

The survey established that most farmers with physical impairments only were able to attend their farms routinely. The problem was farmers with other forms of disability like visual and mental impairment, those with Down's Syndrome, and those with multiple disabilities, who could not contribute to the farming activities. Where they were totally dependent on support, they even drew some labour away from the farming activities to attend to them. It was also established that very few of them were registered with the National Council for Persons With Disabilities (NCPWD), and as such were not recipients of the national government financial assistance for persons with disability. This called for enhanced awareness targeting persons with disabilities together with their families, on the need to register with NCPWD, and to be updated on new and existing support streams for persons with disability. The little they received would reduce financial pressure from their farming families, besides boosting their self-esteem that indeed they also contributed towards the family resources.

#### **4.3.4 Insecurity**

The survey established that previously, resource-based conflicts were common in the target locations. However, continuous awareness creation on the link between peace and resilience

during disasters, together with other peace-building efforts by the local administration, insecurity was of limited concern to the people in Tharaka North and South.

#### 4.3.5 Human Rights

The survey posed the question of human rights to different discussion groups, to determine if it was a matter of concern in the target locations. The less educated farmers expressed general awareness about human rights, and the fact that if someone infringed on their rights, they would report them to the local chief, or to the nearest police station. The more educated participants in the discussions expressed a deeper understanding of the concept, and an awareness on what to do where their rights were infringed upon. The survey was left with the conclusion that human rights was not a big or common concern to the people of Tharaka North and South.

#### 4.4 Findings on Lessons Learnt

In the course of the survey, a number of lessons were picked out from engagement with both farmers as well as key informants, that could inform a project of this nature in future. A few of these are shared below.

- **The need for adequate time for interventions targeting farmers:** In places like Tharaka North and South, the process of mobilizing farmers for new interventions usually takes time. As such, adequate time should be set aside for engaging with them. Most mornings are taken up by farming activities, and any meetings or engagements set in the morning hours will fail.
- **The role of farmer groups:** The survey established that almost all farmers are members of either one or more farmer groups. Accessing such farmers was thus best done through their groups. While on that subject, continuous capacity building for such groups was always necessary, to make them more efficient and effective for their members.
- **Rainwater Harvesting:** The future of increased agricultural production through climate change adaptation in Tharaka North and South heavily depends on the uptake and effective employment of rainwater harvesting practices. The efforts of future interventions must be channeled towards this objective, besides all other suggestions that have been put across by this report.
- **Farming Inputs:** The survey also established the need for increased adaptation towards using farming inputs, for increased productivity. Most of the farms are now old, having been used continuously each year. Without meaningful inputs, most farming efforts will go to waste. Unfortunately, this idea was put across by farmers but next to the fact that most farmers cannot afford the required farming inputs, especially with the prices continually going up. As there was no immediate solution to this challenge, it remained a concern to be addressed in future.

#### 4.5 Findings on Further Opportunities to Explore

Respondents were asked about what more could be done to enhance climate change adaptation and increased agricultural production for food security and food sustainability. Following are a few of the ideas they shared, that could be explored further for future interventions:

- **Introduce newer drought resistant seeds:** Much as the seed varieties already in use in Tharaka North and South were drought resistant, there was still a need for the introduction of even newer drought resistant seeds to the target communities, and keep pace with research and new innovations.
- **Link farmers with new markets:** Access to good markets with higher returns remains a challenge to most of the farmers, who then have to depend on middlemen, brokers, and local aggregators, known for pushing down the farmgate price of all produce. Farmers asked to be linked directly with better markets, so that they could do away with all the middlemen and also enjoy the full benefits of their farming efforts.
- **Expand and enhance the marketing abilities of farmer groups:** The farmers proposed enhanced capacity building in marketing for the already-established farmer groups. This would allow them to independently explore, identify, and engage with better markets for their produce
- **Enhance rainwater harvesting practices beyond what is currently being practiced:** The survey established that the practice of rainwater harvesting was already common among the farmers, even though it was being practiced at a fairly low scale, mostly targeting water for domestic use. The farmers proposed being supported to access bigger water tanks that reserved more water that could be used for modest irrigation. Further, and having borrowed the idea from the experiences of Yatta communities, it was time farmers were supported to construct and maintain individual water pans for each household, besides the construction of communal water pans. This would ensure more water for irrigation for each household, besides easing pressure on the communal water pans.
- **Farmer study tours and exchange visits:** The farmers emphasized the need for more farmer exchange visits and study tours, as it gave them an opportunity to witness how other farmers adapted to climate change and increased their agricultural productivity.

## 5. CONCLUSION AND RECOMMENDATIONS

At the tail-end of this exercise, it was important to reflect back on the purpose and process of the entire survey that led to the production of this report. The survey started by outlining key study areas to focus on, the methodology that was used to generate feedback that has gone into

compiling this report, the work plan, and the study tools to be used. The data collection process in the field went very well, despite a few challenges that were addressed as they emerged. The data analysis process that followed kept revealing insights into the study questions that the survey set out to answer, and which have been presented in detail in the preceding section.

In the course of the survey, several threads of information have kept emerging, either as key points of concern, or as areas that may need extra focus in the course of implementing the project. These constitute the conclusion of this survey, as discussed in the section that follows.

## **5.1 Conclusion**

Based on the above findings, the survey was able to make the following conclusions:

- The future resilience of the target communities depended heavily on their uptake and sustenance of climate change adaptation practices, as their traditional approaches to farming and livelihoods generally were being threatened by the general impact of climate change. This called for concerted efforts to enhance awareness on climate change adaptation practices, and that farmers were practicing them in their routine activities.
- The practice of rainwater harvesting was already common among the farmers, even though it was being practiced at a fairly low scale, mostly targeting water for domestic use. The farmers proposed support to access bigger water tanks that reserved more water that could be used for modest irrigation. Further, and having borrowed the idea from the experiences of Yatta communities, it was time farmers were supported to construct and maintain individual water pans for each household, besides the construction of communal water pans. This would ensure more water for irrigation for each household, besides easing pressure on the communal water pans.
- Much as the seed varieties already in use in Tharaka North and South were drought resistant, there was still a need for the introduction of even newer drought resistant seeds to the target communities, and keep pace with research and new innovations.
- Access to good markets with higher returns remains a challenge to most of the farmers, who then have to depend on middlemen, brokers, and local aggregators, known for pushing down the farmgate price of all produce. Farmers asked to be linked directly with better markets, so that they could do away with all the middlemen and also enjoy the full benefits of their farming efforts.
- There is a need to enhance the marketing capability of farmers, beyond securing good markets for them. That way, they will, on their own, identify and assess suitable markets for their produce, and establish a network with such markets. Farmers proposed enhanced capacity building in marketing for the already-established farmer groups.
- There is a need for more farmer exchange visits and study tours, as it gave them an opportunity to witness how other farmers adapted to climate change and increased their agricultural productivity.

## **5.2 Recommendations**

At which point it was now possible to present the recommendations of this survey. Most of the recommendations were proposed by the farmers and discussed at length with them. Some of them were proposed by officers providing support services to farmers, based on their observation

of what was happening on the ground. However, a few of them were proposed by the survey team, based on their engagement with the target communities.

- i) Revise some of the output targets and make them realistic, since most of them have been surpassed by the baseline data
- ii) Introducing even newer drought-tolerant seeds into the target location, to keep up with the pace of both the impact of climate change on agricultural production, and to benefit from new research and innovations globally
- iii) The project should channel a lot of its efforts towards rainwater harvesting technology and management, since water remains the biggest link between the target communities and successful climate change adaptation
- iv) Link farmers with new and better markets with higher returns. This will help the farmers to eliminate middlemen and brokers from their marketing chain, and enjoy the full benefits of their efforts. But even more efforts should be channeled towards enhancing the marketing skills and practices of the target communities.
- v) Enhance rainwater harvesting practices beyond what is currently being practiced, which is mostly for domestic use. Improved access bigger water tanks; the construction and maintenance of individual water pans for each household; and the construction of more communal water pans, will ensure more water for irrigation for each household, besides easing pressure on the communal water pans.
- vi) Make adequate provision for farmer study tours and exchange visits, as farmers learn a lot from witnessing how other farmers have successfully adapted to climate change and increased their agricultural productivity.

## **LIST OF ANNEXES**

Annex 1 - Terms of Reference

Annex 2 – Work Plan

Annex 3 – Data Collection Tools

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