



REPORT OF THE

Solar Powered Irrigation for Food and Nutrition Security (SPIS-4-FNS) Project Kick-Off Meetings, Field Visits and Stakeholder Workshop in Kenya



Implemented in:

Laikipia, Meru and Isiolo, Kenya

12 – 16 May 2025

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SPIS-4-FNS Project Implementing Partners

Sno.	Organization	Personnel	Role / Responsibility
Partners from Germany			
1.	ZALF: Leibniz-Zentrum für Agrarlandschaftsforschung	Götz Uckert	Scientific management and coordination
2.	FiW: Forschungsinstitut für Wasserwirtschaft und Klimazukunft an der RWTF Aachen e.V	Manuel Krauss	Senior scientist, Water harvesting systems
3.	GSAN/PV-Projects, Private company	Mattias Raab	Senior scientist, Energy and solar power solutions
Partners from Kenya			
4.	JKUATES/JKUAT: Jomo Kenyatta University of Agriculture and Technology Enterprises	Bancy Mati	Senior scientist, Scientific research, management & coordination of Kenyan partners
		John Wesonga	Senior Scientist, Scientific research -Agronomist
		Winfred Karugu	Senior Scientist, Scientific research -Economist
		Jeremiah Mbugua	Senior Scientist, scientific research - Extension
5.	MKEWP: Mount Kenya Ewaso Water Partnership	Stanley Kirimi	Senior Scientist, Innovative financing and project out-scaling
		Lena Kamau	Finance administration and scientific assistance
6.	AIAP: Association of Irrigation Acceleration Platform	Alex Odour	Scientist, rainwater harvesting and training, networking
		Mercy Kathia	Scientist, irrigation management and policy
		Kelvin Magochi	ICT management and knowledge sharing
		Betty Nyaga	Finance administration and scientific assistance



Project partners during the kick-off meeting of SPIS-4-FNS in Nanyuki

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LIST OF ACRONYMS

AIAP	Association of Irrigation Acceleration Platform
CF	Cluster Farm
FiW	Forschungsinstitut für Wasserwirtschaft und Klimazukunft an der RWTH Aachen e. V.
GSAN	German Solar Academy Network
JKUAT	Jomo Kenyatta University of Agriculture and Technology
JKUATES	JKUAT Enterprises Ltd
KES	Kenya Shillings
LF	Lighthouse farm
MKEWP	Mt. Kenya Ewaso Water Partnership
RWH	Rain Water Harvesting
RWTH	Research Institute for Water and Waste Management;
SACCO	Savings and Credit Cooperative Organization
SPIS-4-FNS	Solar Powered Irrigation Systems for Food and Nutrition Security
ZALF	Leibniz-Centre for Agricultural Landscape Research

1. Preamble: SPIS-4-FNS Partners & Stakeholder Meeting

The SPIS-4-FNS Partners and Stakeholder meeting was a one-week event – from 12th to 16th May 2025. There were with field visits to the three light house farms in Meru, Nanyuki and Isiolo counties, followed by the stakeholders kick-off meeting, a solar power private sector expo and partners meeting held at the Nanyuki Sports Club. Additionally, the 2nd innovation forum for solar powered irrigation was held in Nanyuki on 19th May 2025 as a separate event, organized by Matthias Raab.

This events drew in participants from the German project team composed of Leibniz-Centre for Agricultural Landscape Research (ZALF), FiW and RWTH Aachen – Research Institute for Water and Waste Management; Kenyan project team composed of JKUAT Enterprises Ltd (JKUATES), Association of Irrigation Acceleration Platform (AIAP), Mt. Kenya Ewaso Water Partnership (MKEWP), GSAN and Farmers from Laikipia, Meru and Isiolo counties; and the private sector. Activities during the week included; field visits, stakeholder workshop, private sector exhibitions on SPIS and RWH technologies and partners meeting. Below is a synopsis of the one-week activities and deliberations.

2. Project Partners Meeting held at JKUATES on May 12, 2025

i) Opening and introduction

The meeting commenced with the introduction of partners attending both physically and virtually (see List of partners above). The main objective of the meeting was to provide an overview of the SPIS-4-FNS project and its workplan and to plan the upcoming stakeholders' meeting.

ii) Welcoming Remarks

Prof. John Wesonga welcomed all the partners to the meeting. He thanked all the partners for their commitment and underscored the importance of launching the project successfully. He informed the attendees that part of the project funding had already been received and that it was now necessary to commence project activities. He also mentioned that PhD students had been identified to work within the project.

Ms. Ariana Bystry, representing BLE and responsible for project administration, conveyed her enthusiasm about the project kick-off. She emphasized that the project was being funded by the Ministry and reiterated her support for its implementation.

iii) Overview of work packages, deliverables and milestones

Prof. Goetz provided a detailed presentation of the project's Work Packages (WPs) as outlined in the proposal, to ensure that all partners had a clear understanding of the tasks and expected outcomes.

WP1: Scientific Coordination

He stated that this WP aimed to ensure effective project implementation, partner coordination, research, communication, dissemination and reporting. It was mentioned that three Lighthouse Farms (LFs) had been selected for the first year to pilot feasible technologies. Stakeholder mapping and gender mainstreaming were highlighted as key tasks, with two female PhD students already identified.

WP2: Baseline Analysis

He explained that a new baseline analysis would be conducted to build upon a prior one, aiding in the identification of cluster farmers to be linked with the LFs.

WP3: LL SPIS Testing and Demonstrations

He indicated that a major deliverable under this WP would be the development of a sustainable impact assessment tool to capture stakeholder views. Participatory research would guide the selection of appropriate equipment for farmers. During discussions, it was noted that the current demo focus leaned heavily on SPIS, and it was agreed that the Food and Nutrition Security (FNS) aspect should also be emphasized. The FoPIA tool was mentioned as useful in surfacing issues faced by farmers. There was a deliberation on whether some project structures could serve flood control purposes. It was agreed that while flood control was not the primary focus of the project, other methods could be employed during implementation without linking them directly to the project. The importance of engaging additional actors for synergy was also acknowledged.

WP4: Stakeholder Engagement and Governance

Partners were informed of the need to build local capacity to maximize LF impacts. It was agreed that relevant actors should be identified during the baseline study to ensure inclusive engagement.

a) Understanding finances and organizing expenditures for SPIS implementation

It was communicated that all tasks were directly linked to the budget. Partners were informed that funds had been released for one year, while PhD students were supported for eight months. They were asked to align their budgets accordingly with the planned activities. Prof. Bancy informed the partners that 10% of the project funds would be retained at JKUATES for administrative purposes.

b) Introduction of PhD Students

The two PhD students – Ms. Priscilla Kanyari and Ms. Winfred Mugwimi – were introduced to the partners and welcomed into the project team.

c) Planning for Field Visits and Stakeholders Meeting

After the kick off meeting the team planned on how to conduct field visits to the three LFs located in Meru, Laikipia, and Isiolo on 13th and 14th May 2025. The stakeholders meeting was scheduled for 15th May 2025, with an expected attendance of approximately 50 participants. An exhibition involving various solar industry actors was also planned for the same day. The

team was informed that several exhibitors had already been contacted. The meeting timetable was reviewed, and roles were assigned among the project partners.

3. Visits to Lighthouse Farms in Laikipia, Meru and Isiolo, May 13-14, 2025

3.1 Purpose of visit:

Site confirmation and notification for lighthouse selection under the SPIS-4-FNS Project.

As part of the preliminary activities for the implementation of the SPIS-4-FNS project, a field visit was conducted on the 13th and 14th of May 2025 across three counties—Laikipia, Meru, and Isiolo. The main objectives of the visit were: (1) to confirm the suitability of the sites proposed to host the lighthouse demonstration projects, and (2) to formally notify the respective farmers of their selection and seek their consent to participate as lighthouse hosts.

3.2 George and Susan Kirigwi Farm – Laikipia County

The first visit was to George & Susan's farm in Laikipia. The farm comprises a total of 5 acres, of which 4 acres are already under irrigation, primarily using drip systems. The source of water is a combination of roof catchment and a strategically constructed water pan with a capacity of approximately 1.3 million litres. Water is pumped from the pan using electricity, incurring high costs of electricity bills.

The farm is a diversified operation that integrates both crop and livestock production. Crops include fruit trees such as oranges, avocados, and apples, alongside staple and horticultural crops such as maize, beans, garden peas, leafy vegetables, and potatoes. In addition, the farm supports dairy farming, poultry production, and fish farming, with the latter conducted within the water pan. The site was confirmed to be suitable for lighthouse activities and Mrs. Susan Kirigwi gave consent to host the project.



SPIS-4-FNS project team with Susan (3rd left) and George (4th right) at their farm

Salient features of the farm

- ❖ A total of 5 acres of land
- ❖ 4 acres are under irrigation
- ❖ Uses drip irrigation
- ❖ Source of water-roof catchment and water pan as outlet (capacity of 1.3 million litres)
- ❖ Water pumped using electricity (estimated cost of Kshs 2000 per month)
- ❖ Major crops are fruit trees (oranges, avocado, apple); field crops (maize, beans, garden peas, leafy vegetables and potatoes)
- ❖ Livestock keeping-dairy, poultry
- ❖ Fish farming in the water pan

After a meeting between the project partners, Susan and George Kirigwi, members present agreed to select this farm as a lighthouse farm for year 2025 project activities.

3.3 Edward Mutiga Farm – Meru County

The second site assessment took place at Edward Mutiga's farm in Meru. The farm is irrigated using a sprinkler system, supported by water sourced from roof catchment and a large water pan. Water harvesting is enhanced through a seasonal stream and a local community water project. The water pan has a significant holding capacity of between 10 to 12 million litres. Initially, the farmer relied on a petrol-powered pump (at a cost of about KES.30,000 per month), but has since transitioned to electric pumping, which has lowered operational costs to approximately KES.18,000 per month. The main crops under cultivation include vegetables, maize, and potatoes. Like the previous farm, there is also a fish farming component within the water pan. Mr. Mutiga expressed willingness to participate in the lighthouse initiative and gave his consent after being informed of the expectations and support structure of the project.

Salient features of Edward Mutiga Farm-Meru

- ❖ Uses sprinkler irrigation
- ❖ Source of water is roof catchment and water pan as outlet; water harvesting is enhanced through a seasonal stream and community water project
- ❖ Water pan capacity is 10-12 million litres
- ❖ Water pumping is currently done using electricity (estimated cost of Kshs 18,000 per month; initially used petrol-powered pump at an estimated cost of Kshs 30,000 per month)
- ❖ Major crops grown-vegetables, maize and potatoes
- ❖ Fish farming in the water pan



The Project team at Edward Mutiga's farm



A water pan at Mr. Edward Mutiga's farm

After a meeting between the project partners with Mr. and Mrs. Edward Mutiga, members present agreed to select this farm as a lighthouse farm for year 2025 project activities.

3.4 Fridah Kairuthi Farm in Isiolo County

The final visit was to the farm owned by Frida Kairuthi in Isiolo. Ms. Frida has two plots. Plot 1, which has been selected for the project, is a 3-acre parcel located in an urban setting. It is currently under drip irrigation powered by a solar system, with water drawn from a shallow well. The farm focuses mainly on vegetable production through greenhouses and also grows livestock fodder. Plot 2, a larger 33-acre piece located in a rural area, uses furrow irrigation supported by a gas-powered generator and draws water from a permanent river. Livestock

activities across both plots include dairy farming, poultry, sheep, and goats. The presence of renewable energy systems, diverse farming practices, and accessibility make the selected plot ideal for demonstrating SPIS technologies. Frida was briefed on the project and gave her consent to host the lighthouse.

Salient features of Fridah Kairuthi Farm in Isiolo

- ❖ Plot 1-in an urban area; 3 acres (selected plot for the project)
- ❖ Plot 2- in a rural area; 33 acres
- ❖ Major crops grown are vegetables (green house); there is also livestock fodder
- ❖ Livestock keeping- dairy, poultry, sheep and goats
- ❖ Uses drip irrigation in plot 1, solar-powered, source of water is a shallow well
- ❖ Uses furrow irrigation in plot 2, gas-powered generator, source of water is a permanent river.



SPIS Research Team at the farm of Ms. Fridah Kairuthi

At the time of the visit (in mid-May), Fridah's farm was fallow, due to the need for market targeting of the cropping season. However, she had already started land preparation for the next crop growing season.

After a meeting between the project partners with Fridah Kairuthi, members present agreed to select this farm as a lighthouse farm for year 2025 project activities.

4. Stakeholder Workshop for Project Kick-off on May 15, 2025

4.1 Preamble

Guidance and facilitation during the event were expertly managed by Stanley, John, Jeremiah and Andrea who ensured smooth proceedings and meaningful engagement. The sessions were implemented in a participatory manner during which participants collaboratively developed the Problem Tree, Solution and Opportunity Tree frameworks. This session resulted in the formation of three focused discussion tables representing stakeholders from Isiolo, Meru, and Laikipia regions.

The SPIS-4-FNS Stakeholder Workshop was successfully held on the 15th of May 2025 at the Nanyuki Sports Club. The event facilitated valuable discussions and knowledge sharing among diverse stakeholders involved in sustainable irrigation and food security initiatives.

Objectives of the workshop were as follows:

1. To register and introduce workshop participants for familiarization
2. To present SPIS-4-FNS Project highlights to the participants
3. To convene county-based group work
4. To facilitate exhibitions by the Private Sector related to SPIS-4FNS project

4.2 Registration and introduction of workshop participants

The stakeholder workshop commenced at 9 a.m. with participants arriving and being registered by AIAP for their attendance. In total, about 50 participants registered for the days event (See Annex below). Prof. Bancy Mati and Goetz presided on the introduction of every group of participants based on their category and origins. These included: Each of organization represented in the SPIS-4-FNS project; A contingent of government officials from various county state departments as well as farmers from Meru, Laikipia and Isiolo counties. This was also the day to unveil the Light House farmers selected from each of the counties after a rigorous multi-criterion assessment by SPIS-4-FNS project team. Each of the Light House farmers was given a chance to introduce themselves as well as three of their satellite farmers.

4.3 Presentation of SPIS-4-FNS Project highlights

SPIS-4-FNS project highlights were presented by Prof. Bancy Mati and Goetz. The duo gave the history and evolution of proposal development, scoping studies and field visit to the farmers of Ewaso Ng'iro basin that commenced in the year 2023, culminating in the approval and launch of the SPIS-4-FNS project in February 2025 encompassing the three counties of Meru, Laikipia and Isiolo. They provided highlights on the project components and responded to questions and comments emanating from the participants.

4.4 Participants workshop

Participants at the workshop (see Annex 1) were drawn from the three counties i.e. Laikipia, Meru and Isiolo. They included farmers, extension officers and NGOs active in the water, irrigation, solar energy nexus as well as the SPIS-4-FNS project implementation partners.

Stakeholder cadres attending the kick-off Workshop in Nanyuki



Participants from Germany (Research Team)



Participants from MKEWP (Research Support Team)



Participants from JKUAT and AIAP



Stanley (2nd left) with Lighthouse Farmers; Edward Mutiga (left), Susan Kirigwi (centre), Fridah Kairuthi (right)



Participants from Laikipia County Government



Farmer representatives from Laikipia County



Farmer representatives from Meru County



Farmer representatives from Isiolo County

4.5 Group Discussions

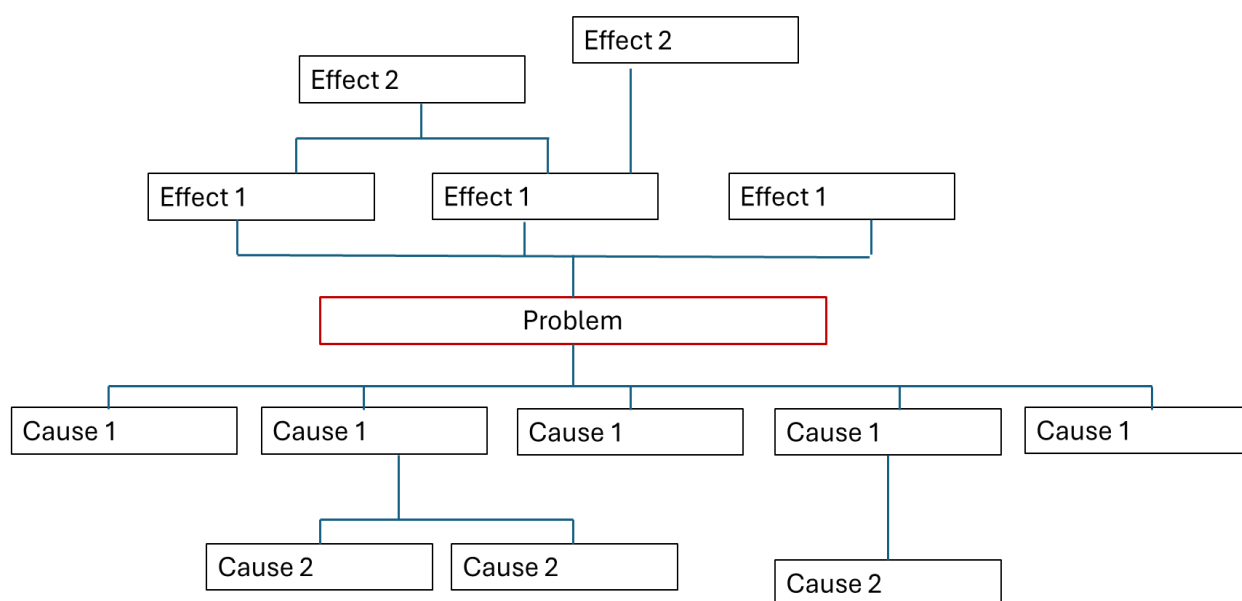
In order to make it easy for the participants in the group work, the facilitators expounded on how they can cluster the problems into categories of installations; conveyance, storage and delivery as well as solar powered irrigation systems. The participants did groupwork as per the three counties of Meru, Laikipia and Isiolo. The participants held discussions to develop the Problem Tree. Thereafter, solutions to the problem tree were also discussed and listed. The themes for the problem tree and solution trees included the following:

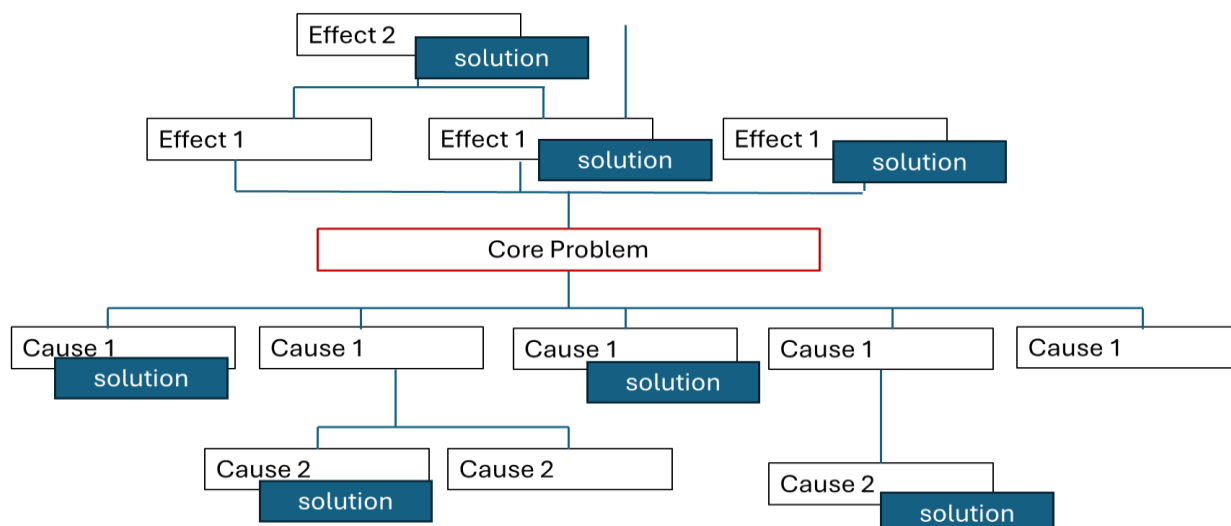
- Challenges and local-based solutions related to installation and adoption of RWH technologies
- Problems experienced in rainwater conveyance, storage and delivery and how these can be addressed.
- Problems related to adoption of SPIS & RWH technologies for FNS and related local solutions towards enhancing the interest in this sector.

Category	Cluster Name (Simple Term)	Example Specific Problems
Installation	High Cost of Building	Excavation was expensive; Couldn't hire machinery
Installation	Lack of Skills and Knowledge	Didn't know how to start; No guidance or support
Installation	Trouble with Materials	Couldn't find a good liner; Bought poor quality pipes
Conveyance/Storage/Delivery	Water Loss and Wastage	Water overflows during heavy rain; Channels break often
Conveyance/Storage/Delivery	Hard to Move Water to Field	Water pan too far from field; Needed pump I can't afford
Conveyance/Storage/Delivery	Storage Not Enough or Not Safe	Water dries up too fast; Storage gets dirty or leaks
SPIS	Too Expensive to Install	Solar pump is costly; Panels were not available
SPIS	Not Enough Knowledge	Don't know how SPIS works; Unsure if it fits my farm
SPIS	Difficult to Maintain or Use	Pump broke quickly; Not sure how to maintain system

After the clustering, the facilitators wrote the core problem candidates on sticky notes (one sticky note per candidate). This helped in ranking of the problems by allowing each participant to place their sticky notes on the charts for voting in order to identify and rank the core problems. Thus, each group produced three problem trees. The same pattern was used to generate the solution trees. Both the problem and solution tree charts where the sticky notes were placed are as shown below.

Characteristics of the farmers and farms identified as lighthouse farms for the SPIS-4-FNS Project activities in 2025 are presented in Annex 2.





Synthesis of the Discussion Session

Session	Description	Time
Introduction	Moderators presents the exercise structure to the participants who are divided into groups. Warm up and Storytelling	10 mins
Problem brainstorming	Each group discusses their experience in three stages: - RWH Installation/adoption - Water Conveyance, Storage, Delivery - SPIS Adoption Participants share challenges; facilitators take notes	30 mins
Facilitator-Led Clustering & Core Problem Selection	Facilitators group specific issues into broader problem 'clusters' per category. They briefly present the clusters back to the group and help select the core problem for each tree.	10 mins
Problem Trees Building – 3 Trees per Group	Groups build a mini problem tree for each core problem: - 10 mins per tree - Write the core problem in the trunk - Use sticky notes for causes (roots) and effects (branches).	30 mins
Solution Trees – Attach Solutions to Trees	Groups identify possible solutions and write them on green sticky notes. They attach them to roots or branches where relevant.	20 mins
Plenary Discussion	Each group briefly presents key insights and highlights from their trees. Facilitators record and collect photos of trees for documentation.	20 mins

Photos of the Group Discussions



Participants from Isiolo take part in Group Discussions



Participants from Meru take part in Group Discussions



Participants from Laikipia take part in Group Discussions

4.6 Exhibition on SPIS & RWH by the Private Sector

Exhibition of SPIS and water harvesting by the Private Sector was also conducted at the Nanyuki Sports Club grounds. The exhibitors were drawn from private companies that included; Dayspring, SunCulture, WaterLift Solar, Pioneer Child Development Programme, Equity Bank (K), and Ewaso Maki Users SACCO. Prior to the exhibition, each exhibitor was accorded an opportunity to pitch about their companies, as well as the services and products related to solar powered irrigation.



Participants attend private sector exhibitions on Solar water pumping at Nanyuki Sports Club

5. SPIS-4-FNS Partners Wrap up Meeting on May 16, 2025

The SPIS-4-FNS Stakeholder Workshop was held on Friday, 16th May 2025 at the Nanyuki Sports Club. This workshop drew participants from the German project team composed of Leibniz-Centre for Agricultural Landscape Research (ZALF), FiW and RWTH Aachen–Research.

SPIS-4-FNS Project partners met on Friday the 16th May 2026 to deliberate on the work packages and re-assign responsibilities among the team members. This was done through breakout groups. In Work Package 3, the project Lead, Prof. Bancy Mati reinforced on the need for Participatory implementation of RWH/SPIS-System. Prof. Wesonga emphasized on food and nutrition security as a key pillar that must always be mainstreamed in the project implementation. For Work package No.4, it was agreed that Matthias, Jeremiah, John and Alex prepare the Capacity Development for the project, with Alex and Matthias having already exchanged some ideas.

One of the issues that was discussed at length was the baseline survey as presented by Prof. Winnie. It was agreed that Winnie will continue providing directions and coordinate the baseline survey activities.

The outcomes of the Friday 16th deliberations, highlighting key insights and actionable opportunities were formally presented on 19 May 2025. Additionally, visual impressions capturing the essence of the day were compiled into a presentation showcased during the 2nd Innovation Forum that was held on the same day - 19th May 2025, at Nanyuki Sports Club.

Annex 1: Characteristics of Selected Lighthouse Farms for SPIS-4-FNS Project in 2025

Gathering information to create a fact sheet for LF farms

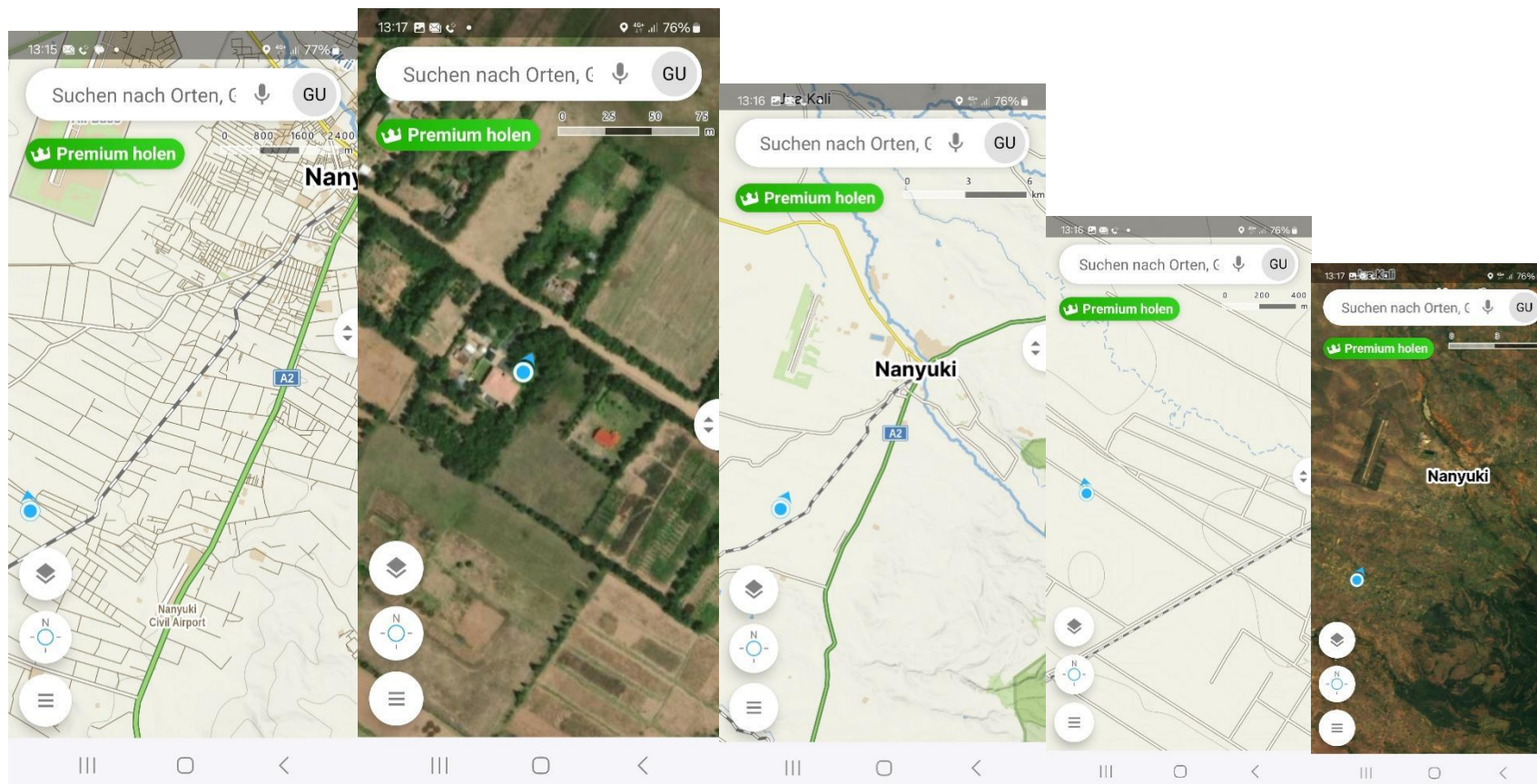
County of Laikipia:

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Name of farmer		Data	Remarks
George Kirigwi and Susan Wanjiru (+ son Ian) (Nanyuki, Laikipia)	Telephone:		
	+254 - 722472505		
Tigithi, Matanya, Kamangura			
Farm specifics	Area	5 acres	
Water demand	Area under irrigation (now)	4 acres	● Uses drip irrigation
	Area under irrigation potentially		
	Crops	Maize Beans Potatoes	
	Fruits	Avocado Oranges Pawpaw Apple	● Ready market for the produce-sells to brokers/marketing agents
	Vegetables	Kale	
	Livestock	Dairy cattle Poultry	● Fish farming done in the water pan

		Fish	
Water supply	Pond 1	1.3 million litres capacity	● Source of water is roof catchment and water pan as outlet (capacity of 1.3 million litres)
	Pond 2		
	Tank (s)		
	From tap		
Energy	Pumps	Electricity	● Irrigation water pumped using electricity (estimated cost of Kshs 2000 per month)
	Household	Electricity	
Photos			





County of Isiolo:

Name of farmer		Data	Remarks
Fridah S. Kairuthi (Isiolo)	Telephone: +254 - 725625104		
Bura / Bulapesa ward, Kambi Juu, Red Cross, Isiolo			
Farm specifics	Area	4 acres	● Plot 1-in an urban area; 3 acres (selected plot for the project)

			● Plot 2- in a rural area; 33 acres
Water demand	Area under irrigation (Now 2023 survey)	4 acres	● Uses drip irrigation
	Area under irrigation potentially		
	Crops	Maize Fodder	● Major crops grown are vegetables and maize ● There is also livestock fodder (napier, bracharia, panchrum, lucerne)
	Fruits	Pawpaw	
	Vegetables	Capsium Tomatoes Bullet Pepper Onions Watermelon Spinach Kale	● Grown in a green house ● Ready produce market-sold to local retailers, marketing agents and hotels
	Livestock	Dairy cattle Poultry Sheep Goats	● Livestock keeping- dairy, poultry, sheep and goats
Water supply	Pond 1		
	Pond 2		
	Tank (s)		
	From tap		

Energy	Pumps	Solar Gas	● Uses drip irrigation in plot 1, solar-powered, source of water is a shallow well ● Uses furrow irrigation in plot 2, gas-powered generator, source of water is a permanent river
	Household	Biogas	
Photos			



The Ndunge ward, Muringe village			
Farm specifics	Area		
Water demand	Area under irrigation now		
	Area under irrigation potentially		
	Crops	Maize Potato	
	Fruits		
	Vegetables	Spinach Cabbage	
Water supply	Pond 1	10-12 million litres capacity	• Source of water is roof catchment and water pan as outlet; water harvesting is enhanced through a seasonal stream and community water project • Fish farming in the water pan
	Pond 2		
	Tank (s)		
	from tap		
Energy	Pumps	Electricity	● Water pumping is currently done using electricity (estimated cost of Kshs 18,000 per month; initially used petrol-powered pump at an estimated cost of Kshs 30,000 per month) ● Uses sprinkler irrigation
	Household	Electricity	
Photos			



