WFP World Food Programme

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Kingdom of the Netherlands

UNLOCKING THE ECONOMIC POTENTIAL OF LAKE TURKANA

Using Foresight for Participatory Programme Design

Foresight4Food


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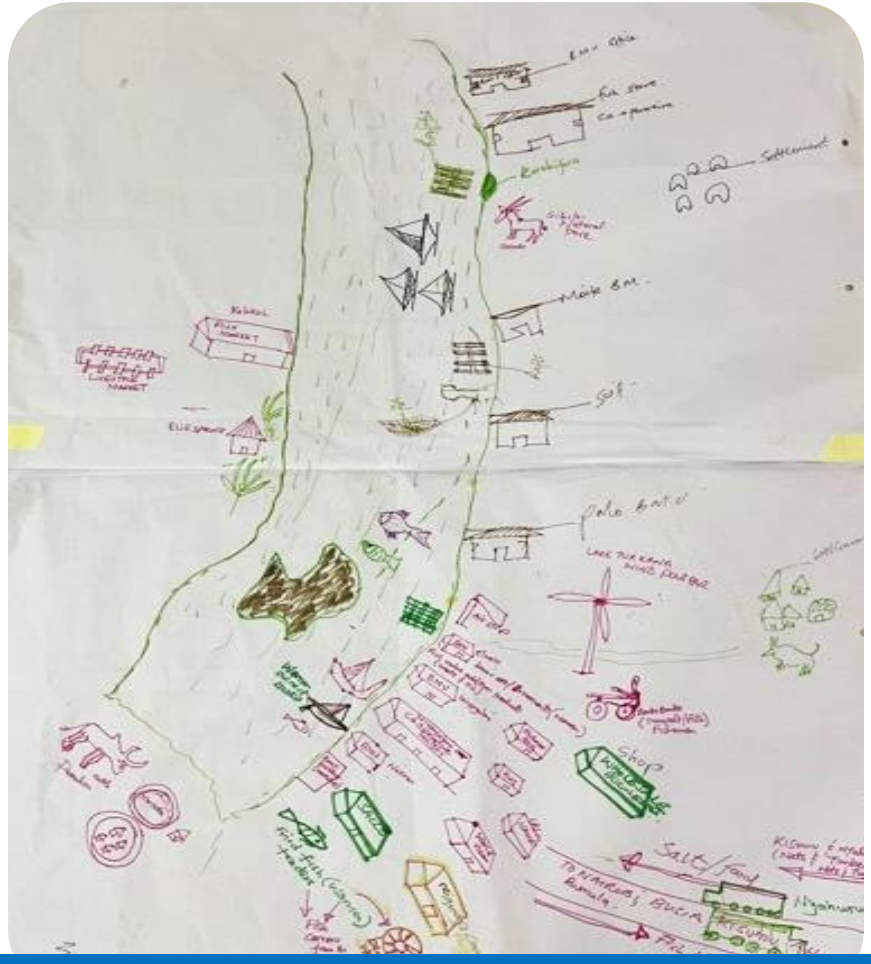
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ACRONYMS

BMU	Beach Management Units
EKN	Embassy of the Kingdom of the Netherlands
KMFRI	Kenya Marine and Fisheries Research Institute
KSH	Kenyan Shilling
CBCC	Centre for Behaviour Change and Communication
ToC	Theory of Change
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
WFP	World Food Programme

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1 INTRODUCTION

In April 2024, the World Food Programme (WFP), with funding from the Government of the Netherlands, launched a 5-year investment programme for Lake Turkana in Northern Kenya - *Sustainably Unlocking the Economic Potential of Lake Turkana*. During 2024, ahead of its January 2025 start, WFP and its implementing partner, the United Nations Educational, Scientific and Cultural Organization (UNESCO) initiated an extensive inception phase to engage local stakeholders to developing the detailed programme design and enhance local ownership.

The inception process involved multiple local workshops and site visits, a series of research studies and two theory of change workshops. The inception phase was guided by a framework of foresight for food systems change developed by the global Foresight4Food Initiative. This was integrated with the Human Centred Development approach also being used by WFP. Consultants working for the Foresight4Food Initiative helped to design and facilitate the inception phase activities and workshops.

This report tells the story of how the foresight for food system change process was used to support the programme's inception phase.

Sustainably Unlocking the Economic Potential of Lake Turkana

Funded by the Government of the Netherlands the programme will be implemented by WFP and UNESCO between 2024-2029 – with a possibility of a 5-year extension. The goal of the programme is to see communities prospering through resilient livelihoods and utilizing lake resources sustainably. The programme has three pillars:

Pillar 1:

Increased access to **climate-resilient livelihoods and market opportunities** for fisher folks and other value chain actors along the fish value chain while promoting healthy ecosystems and using a conflict-sensitive programming approach (led by WFP).

Pillar 2:

Improved **food security and nutrition** of vulnerable people in Lake Turkana through enhanced availability and access to safe and nutritious foods and promotion of healthy diets and complementary nutrition sensitive activities (led by WFP).

Pillar 3:

Enhanced **natural resource knowledge management, and stewardship** for Lake Turkana and its communities (led by UNESCO).

Interventions will address climate adaptation, be environmentally sound, create opportunities to increase peace and social cohesion, focus on the needs of women and youth, include all relevant stakeholders and ensure effective coordination.

Foresight4Food

Foresight4Food is an international initiative and global network that supports the use of foresight for food system transformation. It assists organisations and practitioners access foresight and scenario expertise, syntheses foresight work in the agri-food sector, undertakes methodology development, and provides an online food systems foresight resource portal.

The work of Foresight4Food is enabled by the Foresight for Food Systems Transformation (FoSTr) Programme. FoSTr provides a country support facility for food systems foresight and scenario analysis. The country-led and multi-actor foresight process aims to assist national food systems transformation. The Programme is implemented in four focus countries, Bangladesh, Jordan, Kenya and Uganda.

In Kenya Foresight4Food has been active at both the national and county levels. Alongside the WFP support, foresight processes have been undertaken in Nakuru and Marsabit counties, a *Kenya Food Systems Mapping report* was produced, and Kenya has hosted continental wide foresight capacity development programmes for young leaders.

2 BACKGROUND TO LAKE TURKANA: KEY FACTS AND FIGURES

Lake Turkana, Africa's fourth-largest lake and the largest permanent desert lake in the world, is a transboundary body of water shared internationally by Kenya and Ethiopia and domestically between Turkana and Marsabit counties in Kenya.

Demographics

As per the 2019 Kenya National Bureau of Statistics (KNBS) Census, Marsabit County has a population of around 459,785, while Turkana County is home to 926,976 individuals. Pastoralism is the primary livelihood for over 60% of the local population, but fishing also plays a significant role, providing a major source of income and sustenance for 12% of the population. Overall, approximately 500,000 people depend on the lake's fishery, either directly or indirectly, for food security, nutrition, and income. Marsabit and Turkana are marked by vast arid and semi-arid landscapes and low population densities, primarily rural communities reliant on pastoralism and fishing. Poverty levels are high, literacy rates are low, and access to healthcare and education is limited. Gender roles are distinctly defined, with men primarily engaged in herding and fishing, while women take on household responsibilities, small-scale trade, and childcare. The demographic profile reflects a young population with high fertility rates.

Economic context

Lake Turkana is a vital ecosystem that supports diverse aquatic life and provides livelihoods for local communities. The fisheries of Lake Turkana sustain approximately 9,300 fishers and 6,500 fish traders and transporters on the Turkana side, along with 5,100 fishers on the Marsabit side. On both sides, fisherfolk are organised into Beach Management Units (BMUs), with 10 in Marsabit and 32 in Turkana, some of which have formed fishing cooperatives[1].

Fishing serves as a crucial source of livelihood, particularly during recurrent droughts and for pastoralists unable to maintain their traditional lifestyle due to the increasing severity and frequency of climate-related shocks. Although fish landings from Lake Turkana decreased from 17,300 tonnes in 2022 to 15,900 tonnes in 2023, largely due to rising water levels restricting access to fishing grounds[2], the 2024 KMFRI value chain study indicates a potential for annual fish production to reach 100,000 metric tonnes[3].

The fish value chain in the region is highly intricate, spanning local and international markets, including Kenya, Ethiopia, South Sudan, Uganda, and the DRC. An estimated 31.9% of fish is lost to post-harvest losses along the value chain, significantly diminishing economic benefits for those involved[4]. Additionally, challenges such as fluctuating fish stocks, inadequate infrastructure, and limited market access impede economic growth. Seasonal and inter-annual variations in water levels further affect fish productivity. Additionally, cross-border trade, while economically vital, is riddled with challenges like corruption and strained trade relations due to fluctuating agreements and border controls.

[1] KMFRI (2024). Lake Turkana System Analysis of the Fish Value Chain
[2] KNBS, (2024). Economic survey 2024, Kenya Bureau of National Statistics (KNBS). https://www.knbs.or.ke/wp-content/uploads/2024/05/2024-Economic-Survey.pdf
[3] KMFRI (2024). Lake Turkana System Analysis of the Fish Value Chain
[4] KMFRI (2024). Lake Turkana System Analysis of the Fish Value Chain

Environmental overview

The Lake Turkana Basin, covering approximately 70,000 square kilometres, is often called the "Jade Sea" due to its striking colour. Its waters primarily originate from the Omo River in Ethiopia, which accounts for 90% of the annual water discharge, along with the Kerio and Turkwel Rivers in Kenya. The surrounding landscape features savannahs, rocky plains, and volcanic terrains. The lake supports about 48 fish species, with a dozen sustaining commercial fisheries. The region endures harsh climatic conditions, with average temperatures exceeding 30°C and erratic rainfall ranging from 200 to 400 mm annually. Climate change intensifies these extremes, with projections pointing to longer dry spells and more intense rainy seasons, increasing the frequency of extreme weather events. These environmental pressures pose significant threats to the lake's ecosystem and the communities that depend on its resources.

Food and nutrition security

Despite the abundance of fish in Lake Turkana, it is among the least consumed sources of protein, with dietary habits dominated by starchy staples (82%) and legumes (48%). Fish consumption stands at a mere 14%, hindered by cultural biases, limited knowledge of preparation techniques, and market accessibility challenges. Many communities, particularly pastoralists, view fish as a low-status food, further compounded by taste and smell aversions. However, there is growing awareness of the health benefits of fish, and improving preparation skills among women is emerging as a positive trend. Significant dietary disparities persist across gender, age, and socio-economic groups, with younger populations displaying greater openness to dietary changes. Malnutrition rates in Turkana and Marsabit counties significantly exceed national averages, with 22.4% of children acutely malnourished (wasted) in Turkana and 20.4% in Marsabit—both well above the globally defined emergency threshold of 15%.[5]

Conflict dynamics

The interplay between climate change, livelihoods, and conflict in the Lake Turkana region is complex. Climate impacts such as droughts, floods, and displacement disproportionately affect vulnerable communities, driving unsustainable coping mechanisms and intensifying resource competition. This has escalated conflicts over water, grazing land, and fishing grounds, further exacerbated by weak institutions and eroded social support systems. Transboundary governance challenges along the Kenya-Ethiopia border heighten these tensions, with ineffective mediation often allowing disputes to escalate into violence. Four pathways link climate change to conflict: increased mobility and competition, declining traditional livelihoods, erosion of customary institutions, and rising ethnic territorialisation over resources. Development interventions occasionally exacerbate divisions when perceived to favour one tribal group over another.

Political economy around Lake Turkana

The political economy of Lake Turkana is characterized by deep power imbalances, systemic exploitation, and governance challenges. Fisherfolk, especially women, often face low prices, high input costs, and exploitation within a value chain further complicated by the presence of cartels and corruption. The entry of external private sector actors raises concerns about increased exploitation and potential disruptions to local market structures. Aid distribution has also been uneven, with certain areas receiving more resources based on perceived success potential, or being safer and less marginalized, leading to inequality in development outcomes. Local governance structures, particularly county governments and Beach Management Units (BMUs), are critical to fisheries management but are plagued by inconsistent effectiveness and transparency. Some BMUs are evolving into cooperative structures, yet overlapping mandates between government departments (natural resource protection versus economic benefits) and shifting political leadership result in conflicting objectives and uneven resource allocation.

[5] Kenya Demographic and Health Survey, 2022, https://dhsprogram.com/pubs/pdf/PR143/PR143.pdf

3 OVERVIEW OF THE INCEPTION PROCESS

Guided by the Foresight Framework (Box 2) developed by Foresight4Food, the inception phase involved stakeholders (Box 1) in scoping the process, mapping the Lake Turkana system, identifying future scenarios and then exploring pathways for change. Figure 1 illustrates the overall set of inception phase activities and their timing.

The inception phase for the programme began with community consultations to profile the unique characteristics, livelihood activities, and stakeholder dynamics of the area. Scoping missions followed, focusing on sensitizing county leadership, engaging stakeholders in the fish value chain, and evaluating water resources. Stakeholder engagement forums held in Turkana and Marsabit counties brought together diverse actors to map systems, assess trends and uncertainties, construct scenarios, and build a shared vision for change. To address critical knowledge gaps, several studies were commissioned, covering areas such as the fish value chain, food and nutrition security, water security, and conflict dynamics. The process also included a private sector roundtable to validate system maps and identify opportunities for economic development. The inception phase culminated in two Theory of Change (ToC) workshops, where findings were validated, and synthesized to develop strategies that address the needs of communities in Turkana and Marsabit counties.

Box 1: Stakeholders involved in the foresight process

Organizations and stakeholder groups represented in the inception phase activities:

National Government:
Kenya Fisheries Service, Blue Economy, Water Resource Authority, Kenya Wildlife Service

Local/County Government:
Fisheries, Natural Resources, Health and Nutrition, Education Departments

Community/Women's Groups:
Boat makers, fishermen, traders, pastoralists

Research Institutes:
Kenya Marine and Fisheries Research Institute (KEMFRI), Lattice Aqua, Turkana Basin Institute

Beach Management Units:
Cross-Border Fish Traders Sacco

Private Sector:
Traders, solar driers, cold chain storage, boat makers, fishermen

NGOs:
International Alert, Mercy Corps, Arid & Semi-Arid Lands Initiatives for Environmental Conservation & Development

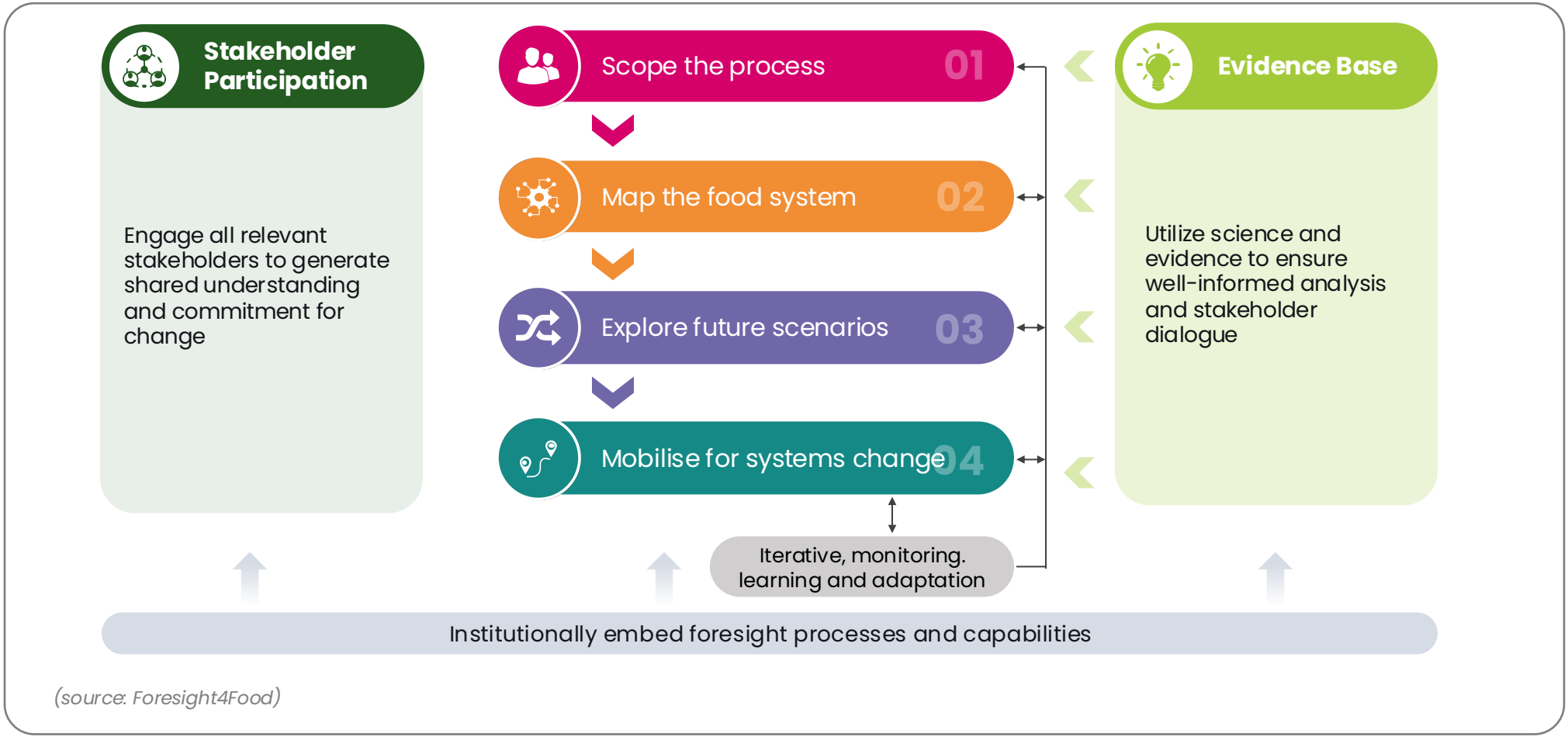
Donors:
Embassy of the Kingdom of the Netherlands, USAID (Nawiri)

UN:
World Food Programme, UNESCO

Box 2 - The Foresight4Food Framework for food systems change

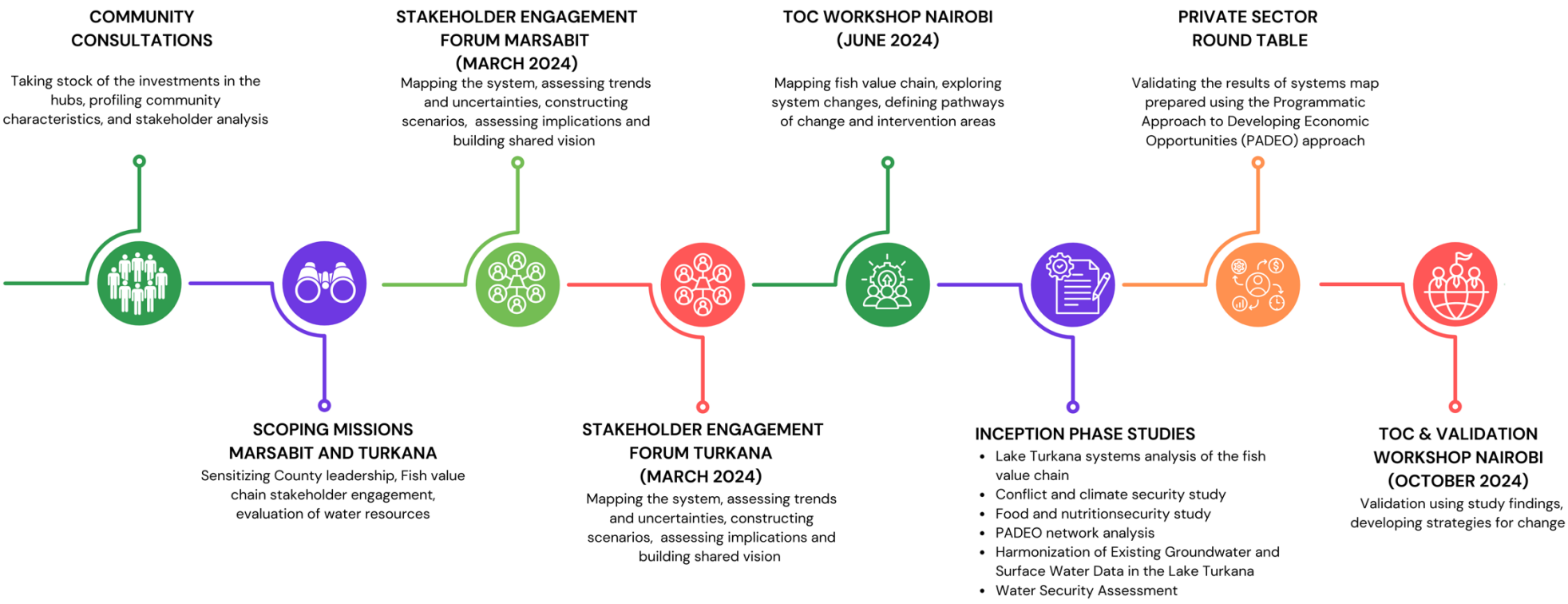
Foresight supports transformational change toward a more equitable and sustainable food system. By using futures thinking and scenario analysis, it helps diverse actors—such as fisherman, farmers, food processors, small agri-food businesses, and governments—jointly explore how the future might unfold. This approach highlights potential risks and opportunities for positive food systems transformation.

The Foresight4Food Initiative has developed this framework to guide foresight and scenario analysis for food systems change. The framework, illustrated below, articulates the different dimensions and approaches in foresight and how they relate to each other. This framework links participatory stakeholder engagement with scientific evidence, and visualization of data. It begins by understanding how food system actors perceive the system—their actions, values, interests, and motivations for engaging in foresight. It also maps how social, technical, economic, environmental, and political factors interact within food systems and examines the power dynamics influencing these interactions.



(source: Foresight4Food)

Figure 1: Inception phase activities



3.1. Community consultations

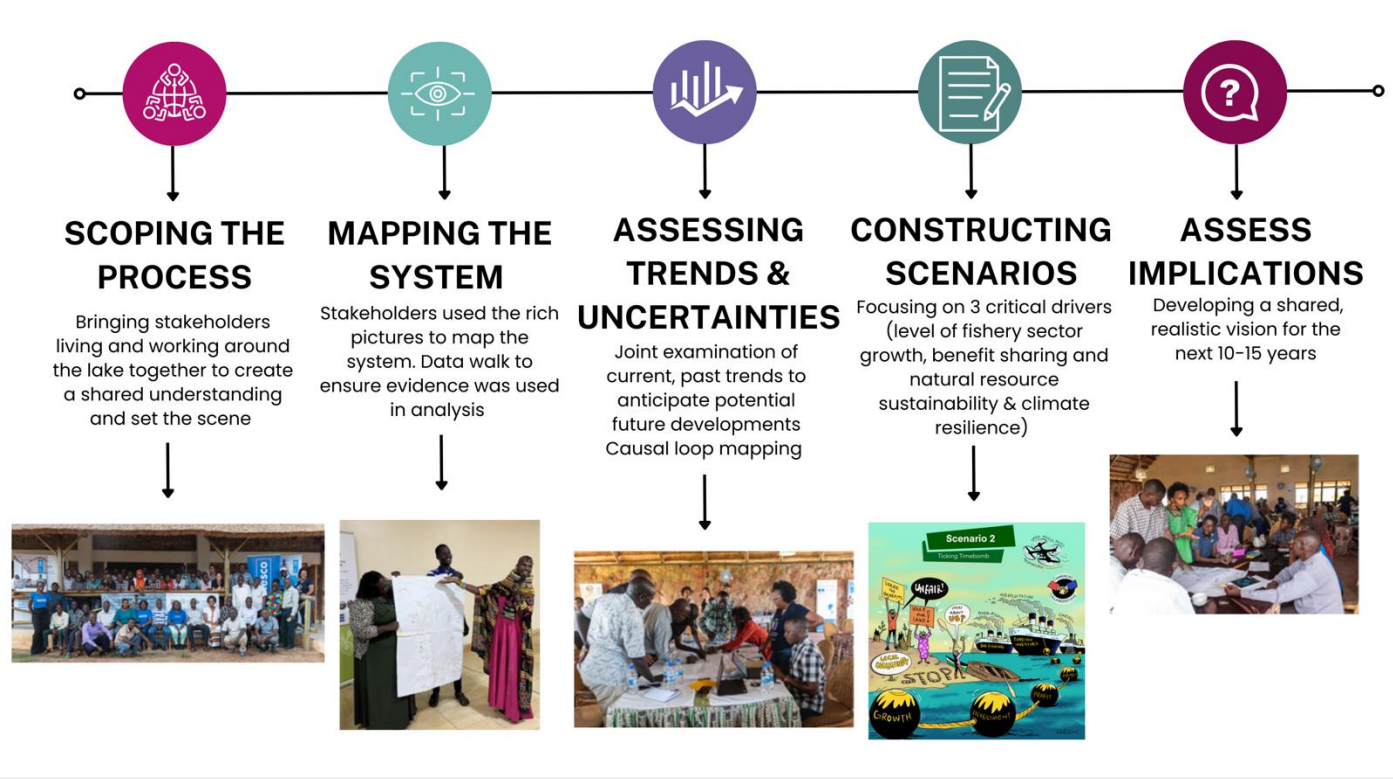
During the inception phase, the County Governments of Turkana and Marsabit, with support from WFP, carried out community consultations in the Lake Turkana hubs: the Lake Zone hub in Turkana County and the Loiyangalani-Moite-Illeret hub in Marsabit County. These consultations, part of WFP's hub-targeting initiative, assessed investments in the hubs, profiled community characteristics such as livelihood activities and opportunities for youth engagement, and included a stakeholder analysis.

3.2. Multistakeholder fora

The multistakeholder fora, held in Turkana and Marsabit counties, brought together diverse stakeholders living and working around Lake Turkana. Participants collaborated to develop a shared understanding of the food system and the challenges faced within the region. They mapped the system through rich pictures, conducted data walks to gather evidence, and identified key trends and uncertainties affecting the fisheries sector. These efforts laid the groundwork for constructing scenarios that focused on critical drivers such as fishery sector growth, benefit sharing, and natural resource sustainability. The fora culminated in developing a collective vision for the region's future over the next 10–15 years.

Figure 2 below shows how the different steps in the foresight framework work covered in the multistakeholder fora.

Figure 2: Foresight process in multistakeholder fora



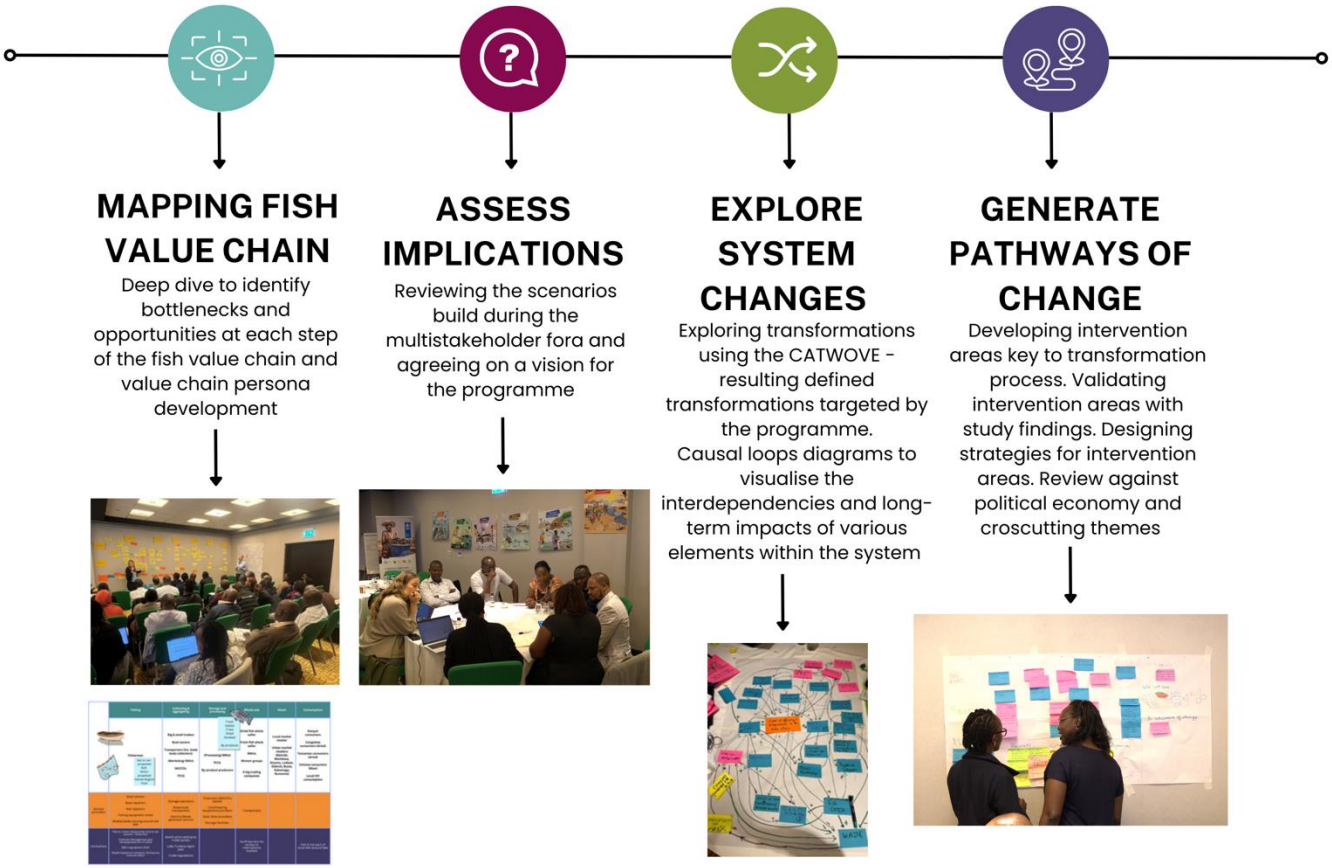
3.3. Background research

During the inception phase, five key studies were commissioned to address information gaps and enhance understanding of various dynamics in Marsabit and Turkana. These included an analysis of the fish value chain conducted by KMFRI, an assessment of the nutrition situation and consumption behaviours among local communities by CBCC, an examination of climate-induced conflict in the programme areas, and an assessment of water (in)security. These studies were complemented by the PADEO system analysis, which focused on the economic dimension and private sector involvement in the fish value chain, highlighting opportunities and challenges. Additionally, the inception phase supported the initial stage of a fish acoustic survey set to continue in December 2024, and ongoing experimental fishing activities.

3.4. ToC workshops

The Theory of Change (ToC) workshops in Nairobi built on the outputs from the multistakeholder fora. In the workshops participants explored a systemic approach to change (Box 3). Participants also conducted a deep dive into the fish value chain, identifying bottlenecks and opportunities while developing personas to represent different stakeholders within the system. They assessed the implications of the scenarios created earlier, explored potential system transformations using tools like causal loop diagrams, and defined targeted changes for the programme. The workshops concluded with the generation of pathways for change, including designing and validating intervention strategies that aligned with political, economic, and cross-cutting themes critical for long-term transformation. Figure 3 below shows how the different steps in the foresight framework work covered in the multistakeholder fora.

Figure 3: Foresight Process in ToC and validation workshops in Nairobi

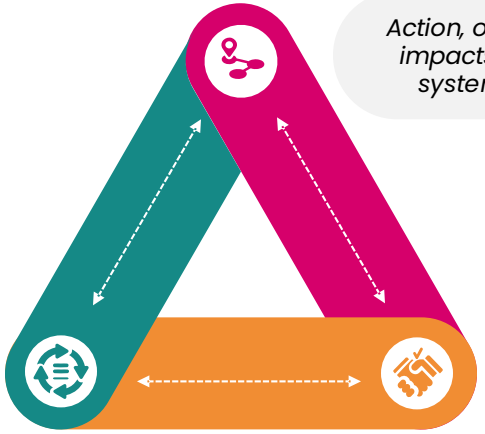


Box 3: Key features of a systemic approach to theory of change (ToC)

The theory of change (ToC) workshops were designed around a systems approach, building on the earlier systems mapping and scenario work. The idea of a systemic ToC is to design interventions with an understanding and acceptance of the uncertainty and unpredictability of how complex and adaptive systems behave. This means avoiding top-down, linear, and highly pre-planned results driven intervention strategies which often fail in more complex settings. Instead, a systemic ToC needs to focus on the dynamics of the system and identifying leverage points for change, with an understanding of the political economy and power dynamics. Interventions need to be experimental and learning oriented, achieving impact by quickly scaling up things that are working and stopping what is not working. This requires a focus on the processes and principles of change rather than only on predetermined results and activities.

Designing around the dynamics of complex adaptive (human) systems

- Self-organizing
- Complex relationships
- Unpredictability
- Uncertainty
- Tipping points
- Diverse behavioral incentives
- Power dynamics



Pathways

Action, outcomes and impacts needed for systems change

Processes

The processes for stakeholders to organize for change

Partnerships

The partnerships and alliances needed to drive change?

Adaptive Management

Managing interventions for complexity - relationship building, mindset change, experimentation and learning, agility, entrepreneurship, localized decision-making)

4 SYSTEMS MAPPING OF LAKE TURKANA

The first part of the stakeholder workshops in Marsabit and Turkana counties was developing a shared understanding of the overall lake system and the concerns of different stakeholders. This involved visualizing the lake "system", and doing deeper analysis of issues using causal loop diagrams, as well as exploring available data.

4.1. Developing rich pictures

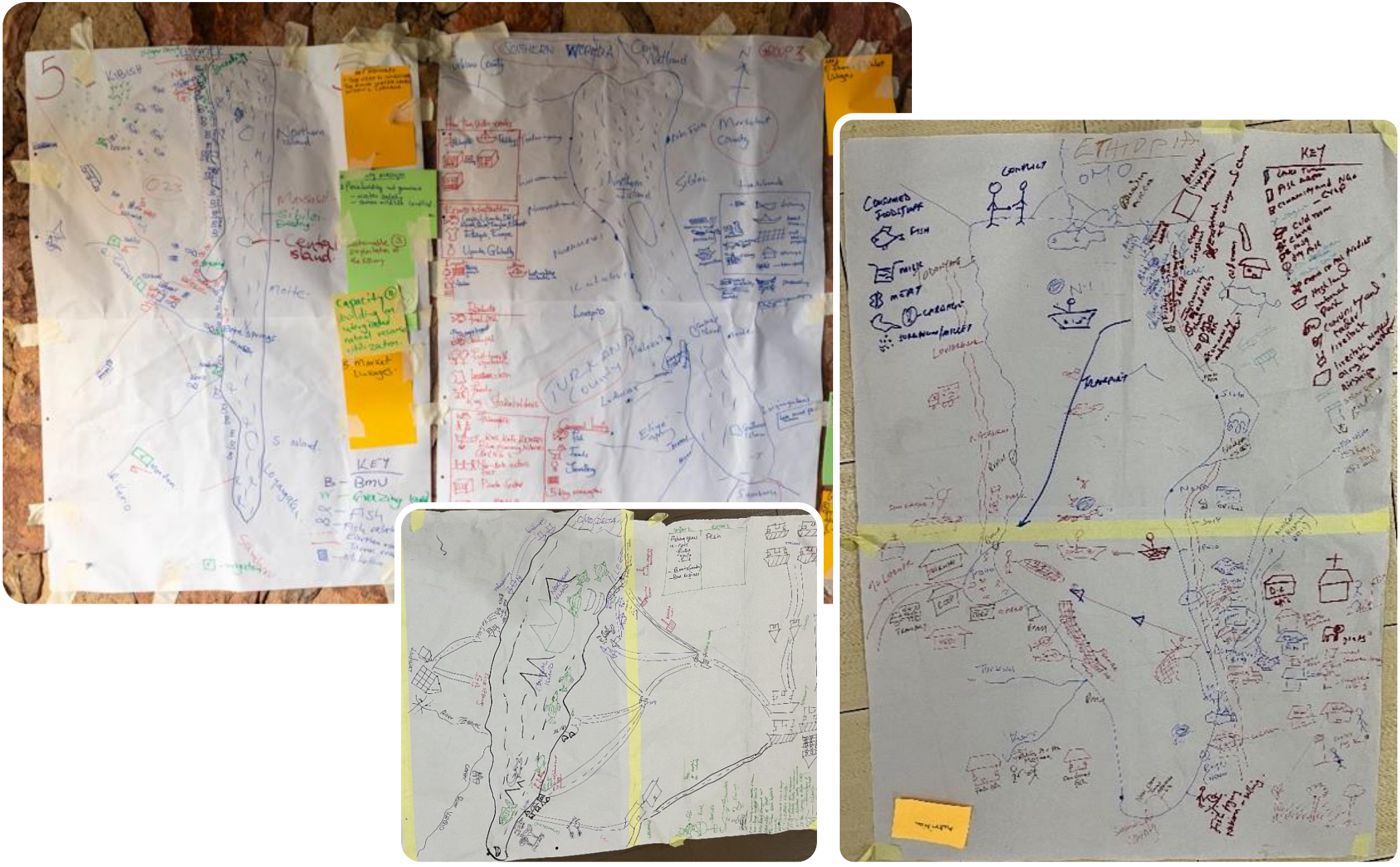
Participants created ***rich pictures*** (Box 4) of Lake Turkana, mapping geographical features, land uses, fish value chains, and other livelihood sources. This exercise helped identify and visualize key system elements and relationships. The process encouraged reflection on the emerging issues and challenges, stakeholder roles, power dynamics, and governance structures, creating a shared understanding of the system around the Lake.

Box 4: How to develop rich pictures

The rich picture technique is a classic but powerful tool for systems thinking. In small groups of 5-10 people, participants collaboratively create a visual representation of the system they are analysing. As the saying goes, "a picture tells a thousand words," and this process allows for a rapid, shared understanding of the system, while capturing diverse perspectives. Rich pictures illustrate not only the physical elements of food systems but also key stakeholders, their relationships, information flows, and relevant social, economic, political, and environmental issues.

It is essential that all participants actively contribute, each with a marker in hand, without concern for drawing skills. Rich pictures can include both factual and subjective information. Participants are encouraged to use drawings, symbols and icons to illustrate the key features of the system.

Figure 4: Examples of rich pictures drawn by participants



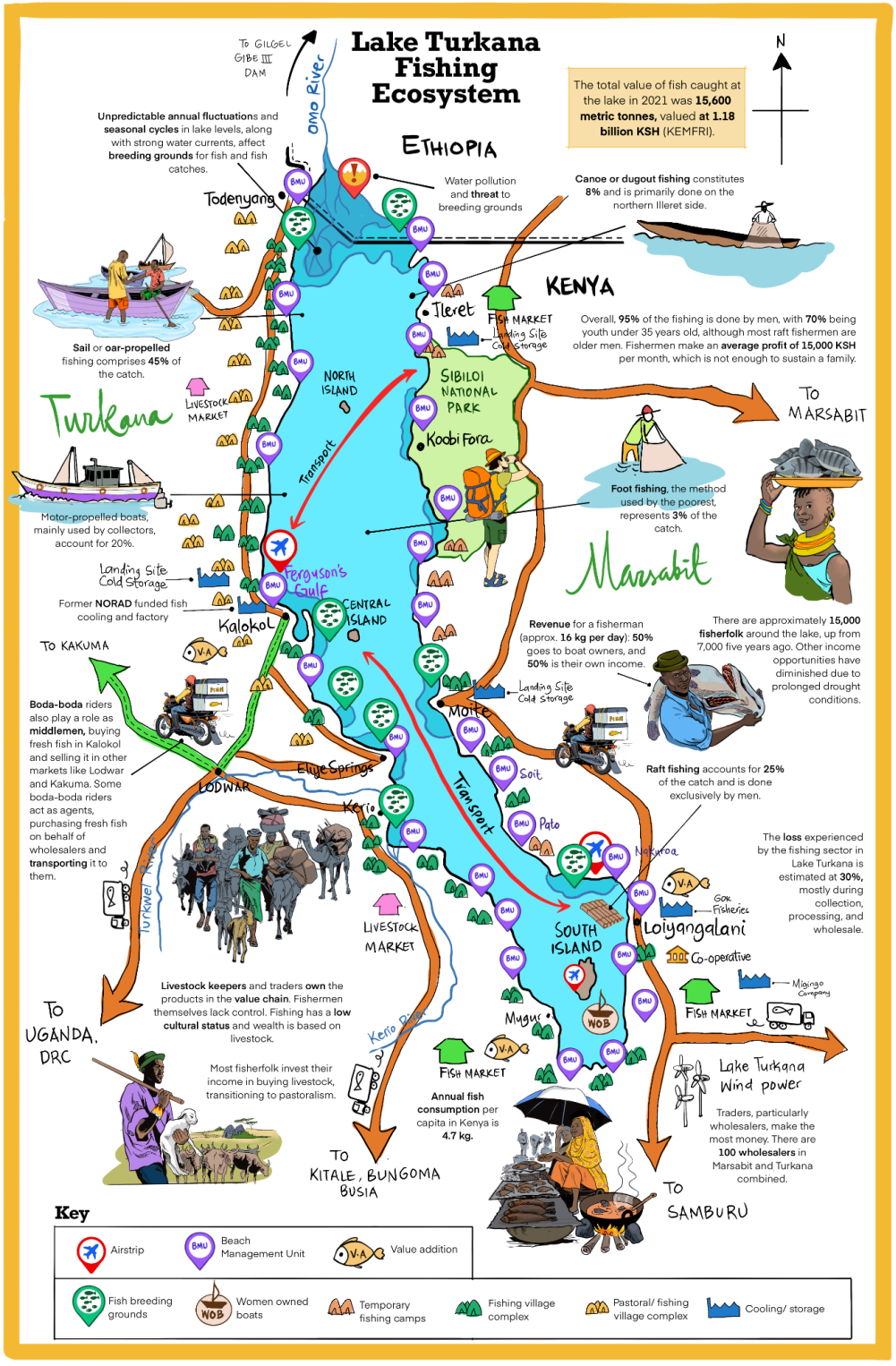
Groups presented the rich picture to each other. Key messages and challenges that came out of the rich picture are included in the table below.

Table 1: Examples of the information included in rich pictures about Lake Turkana

Lake ecosystem and resources	Water pollution and safety, fluctuating water levels, high fluoride content, lack of effective solid waste management, unsustainable exploitation and conflicts between resource users, absence of accurate stock assessment. Sustainable water management and ecological conservation efforts are insufficient. There is a lack of education on conservation and sustainable practices.
Fishing practices	Limited knowledge on sustainable fishing practices, need for social behavior change towards illegal fishing, insufficient development aquaculture and fishing cages, significant post-harvest losses along the value chain
Fishing practices	Fishing practices are not always sustainable, and cooperatives play a crucial role. Inadequate and poor-quality gear, lack of maintenance knowledge, vocational training for boat/net making needed
Transport & infrastructure	Poor landing site infrastructure, lack of cold storage and processing facilities, transport challenges, potential in fish waste utilization. Infrastructure, including roads, sanitation, and communication networks, is underdeveloped.
Nutrition Security	Preference to sell fish instead of consuming, doum palm seeds in demand for fish smoking and baskets instead of consumption
Rules and regulations	Disparity in market value and return for fishers, need for microfinance, need for breeding zone demarcation.
Institutional strengthening	Need for clear regulations on lake management, unclear roles and responsibilities of Beach Management Units Community involvement in decision-making processes is limited.
	Youth engagement and debt management strategies needed (fishers perpetually being in debt to traders affecting livelihoods)
Alternative livelihoods	Local tourism (e.g., Kobi Fora) contributes to revenue, but market access remains a challenge.
Education	Education services inadequate. Children's involvement in fishing often leads to high dropout rates from school.
Health care	Health care services inadequate.
Development opportunities	renewable energy sources, improved safety protocols, value addition, market development, and nutrition education.

Figure 5: Composite rich pictures based on the multiple rich pictures of participants

The rich pictures created by participants, along with key insights from their analyses, were synthesized by an illustrator into a single comprehensive visual representation.



4.2. Data walk

As part of the stakeholder fora, a **data walk exercise** (Box 5) was conducted to ensure that research evidence was effectively integrated into the analysis phase. This participatory activity provided an opportunity for participants to engage with key data and trends related to the East Africa, Kenya, and Lake Turkana food systems. Posters displaying critical information—such as water levels, fish stock, infrastructure maps, and food security data—were arranged into thematic stations. As a result, the scenarios that would be developed later, were more robust, grounded in evidence, and reflective of diverse stakeholder perspectives.

Box 5: How to guide a data walk

As much available data as possible is collated, ideally in the form of graphs, info-graphics, and tables, this is printed on A3 or A4 sheets and stuck to the walls around the workshop room in relevant themes of data. Participants form small groups of 2-3 people and move between thematic stations. At each station, they explore the data and discuss key questions, such as *What do you see? What confirms what you already know? What surprises you?* Their reflections were captured on sticky notes, which they attach directly to the posters to highlight observations, insights, and any missing information. This process encourages active engagement with the evidence base, allowing participants to explore how their own view and assumptions align or differ with available evidence.

4.3. Causal Loop Diagrammes (CLDs)

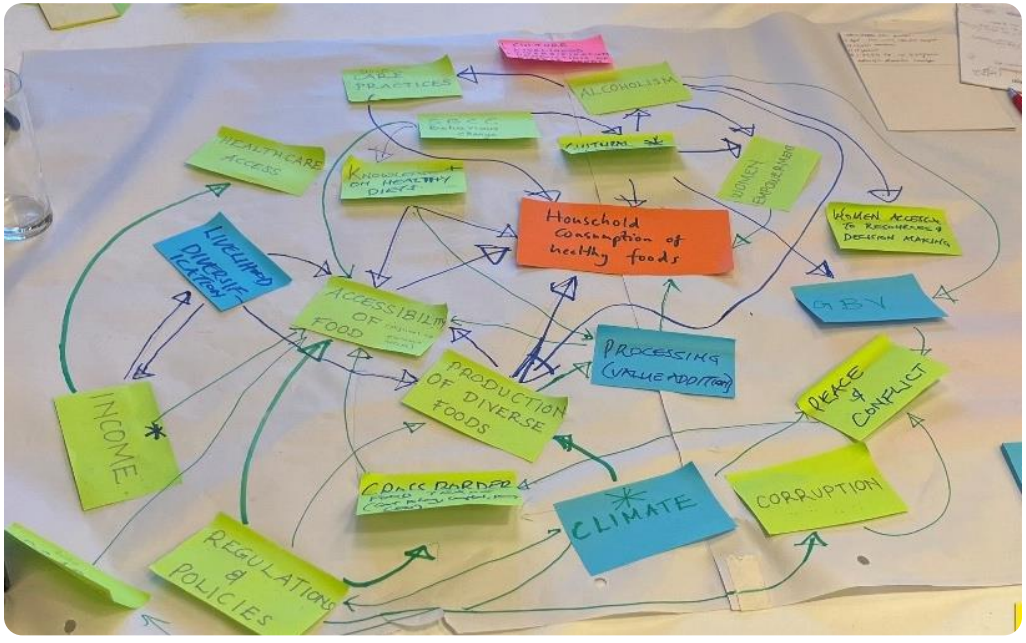
In both the multistakeholder fora and the ToC workshops participants used ***causal loop diagrammes*** to create a "snapshot of all relationships that matter" in the Lake Turkana food system (Box 6). Causal loop diagrams were developed around key issues such as healthy lake ecosystems, climate resilience, gender and youth empowerment, food and nutrition security, social cohesion, financial freedom, and fish marketing. A causal loop diagram visually represents key variables (such as factors, issues, and processes) and their interconnections. Causal loop analysis helped participants identify opportunities for interventions that can drive systems change in desired directions. Beyond structural changes in policy, practice, and resource flows, participants also explored alternative pathways for influencing systems change, including shifting mental models and fostering relationships and alliances for change.

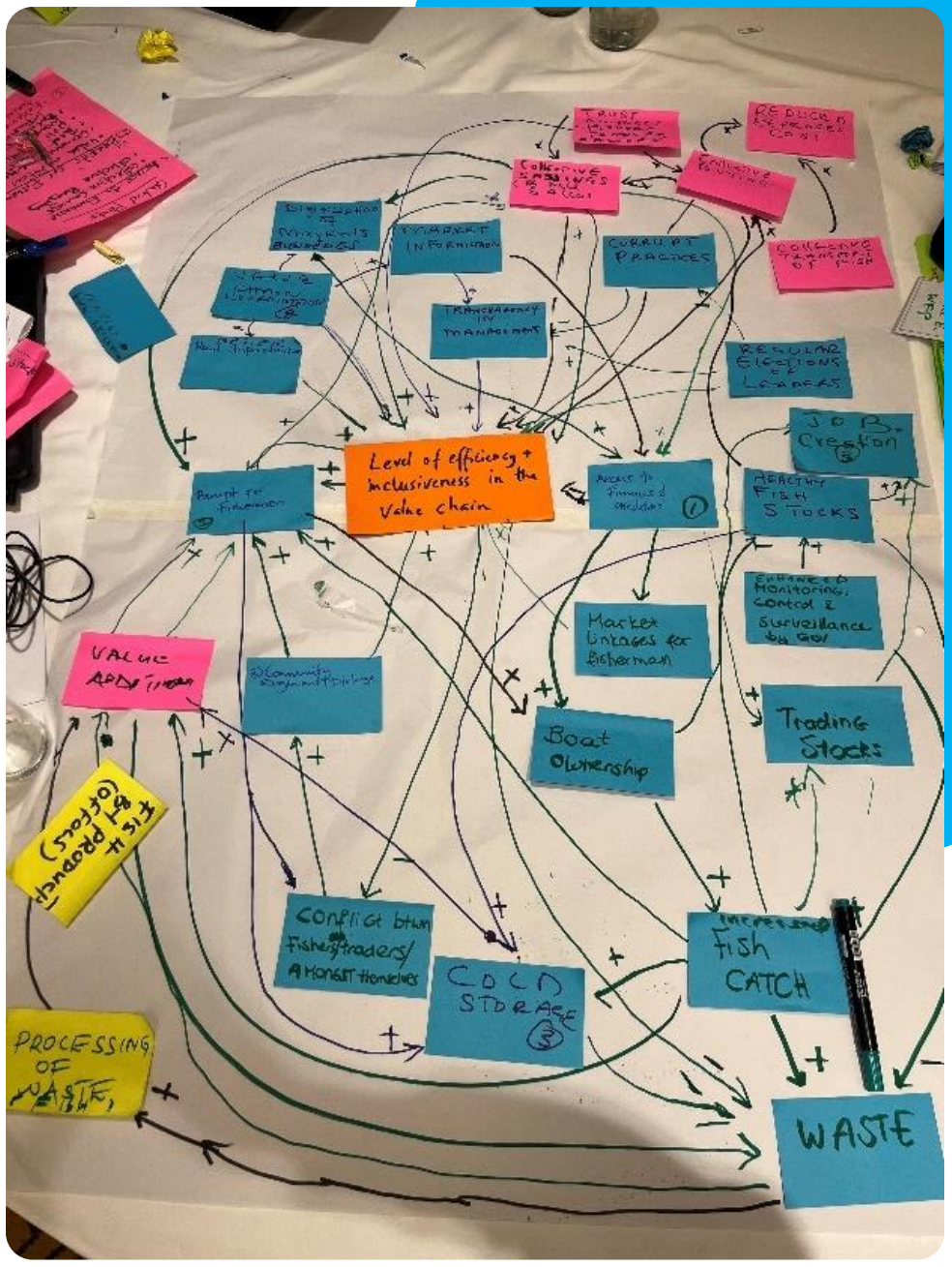
Box 6: How to causal loop diagramming

A key issue in food systems transformation, such as lake ecosystem health, is identified, and participants split into groups, each assigned one of the central issues. They start by brainstorming 5–10 key variables related to their issue, writing each on sticky notes. These notes are placed on a flipchart, where participants use arrows to link them, illustrating relationships and causal connections. Through guided questions like "*if this leads to that, what happens next?*" and "*over time, what other effects might this trigger?*" they uncover additional elements and refine their diagram. This iterative process allows participants to visualize the interdependencies and cascading impacts within the system.

Group with causal loop diagram

Figure 6: Examples causal loop diagrammes





5 SCENARIOS FOR THE FUTURE OF LAKE TURKANA

Scenarios examine how the future might unfold under the influence of differing critical uncertainties. Exploring different future scenarios allows stakeholders in a food system to identify potential risks and opportunities. It challenges their underlying assumptions and beliefs, and helps to develop a shared vision of more desirable futures. This approach is a powerful tool for engaging stakeholders in discussions about systems change. The scenario-building process involved analysing key trends and critical uncertainties, constructing scenarios, and assessing the implications of these scenarios for different actors and for the future of Lake Turkana.

Participants developing scenarios in Marsabit workshop

5.1. Identifying key drivers

To develop future scenarios, the first step is to identify the key trends and critical uncertainties that may shape the future. Numerous factors, or drivers, influence the trajectory of food systems. These include demographic changes, technological advancements, food consumption patterns, geopolitics, economics, markets, culture, environmental factors, and climate change. These drivers are highly interconnected, interacting with each other to shape food-related activities and outcomes. Drivers of change can be classified into two categories: key trends and critical uncertainties. Key trends are well-defined, observable changes that will inevitably shape the future, whereas critical uncertainties are unpredictable events or shifts that could have significant impacts, potentially resulting in vastly different outcomes for the food system.

Participants analysed a set of key drivers (Table: 2) by exploring the current situation (2024), how it has changed over the past 10 years (since 2014), and it might be in the future (2040). Participants then discussed the reasons for change and their assumptions about what will drive change into the future.

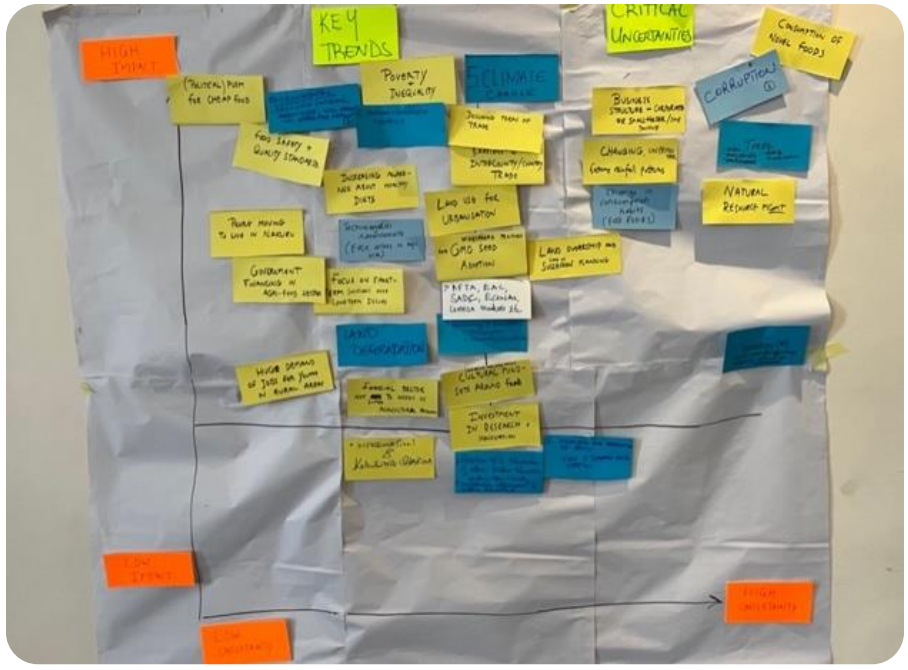
Trend analysis of poverty

Trend analysis of conflict

Explanation of driver and trend analysis exercise

Table 2: Key drivers impacting on the future of Lake Turkana

Climate change	**Local fish consumption**
Lake levels	**Infrastructure**
Population	**Conflicts**
Pastoralism	**Nutrition**
Deforestation	**Poverty**
Fishing methods	**Sources of household income**
Number and types of fisherfolk	**Migration**
Fish markets	**Types of fish in the lake**
Education	



Drivers clustered into key trends and critical uncertainties

Presenting trend analysis

5.2. Identifying critical uncertainties

After brainstorming drivers in small groups, participants reconvened in plenary to identify the most critical drivers and categorize them as key trends or critical uncertainties. This categorization was based on their data analysis during the data walk, the outcomes of the rich pictures and causal loop diagrams, and the sector-specific expertise present in the room. From the full list of uncertainties, participants then identified three critical uncertainties with the greatest potential impact on the system.

Three critical uncertainties were chosen around which to development scenarios:

- Level of fishery sector growth
- Degree of benefit sharing
- Extent of natural resource sustainability and climate resilience

5.3. Developing scenarios

Combinations of the three critical uncertainties were used to develop six different scenarios as illustrated in Table 3. Participants were assigned one scenario each and tasked with imagining Lake Turkana in 2040. They described daily life, environmental conditions, and economic and food systems in this envisioned future. Additionally, participants reflected on stakeholder actions, potential power dynamics, and innovations that could emerge within their scenario. This process aimed to identify desirable and undesirable outcomes and equip participants with insights to inform the desired changes in the system.

Table 3: Scenarios developed from combinations of critical uncertainties

Scenario number	Title	Level of fishery sector growth	Degree of benefit sharing	Extent of natural resource sustainability and climate resilience
1	Tumaini paradiso	High	High	High
2	Ticking timebomb	High	Low	Low
3	Short gain, Long pain	High	High	Low
4	Professionalized sustainability	High	Low	High
5	Gasping blue, space for something new	Low	High	High
6	Darkness of life	Low	Low	Low

Group presenting scenario (left)
Participant presenting scenario (right)

The information and story lines developed about each scenario during the workshops were subsequently shared with an illustrator to create the visuals for each scenario shown on the next pages.

SCENARIO 1:
Tumaini Paradiso

High level of fishery sector growth, high degree of benefit sharing, high extent of natural resource sustainability and climate resilience

The Lake Turkana food system has transformed into a balanced and thriving ecosystem. This scenario paints a picture of optimism where sustainable practices, modern technologies, and an inclusive fish value chain have unlocked prosperity for Lake Turkana. Communities around the lake enjoy improved livelihoods, healthier diets, environmental stability, and improved security. The harmony between conservation and economic growth ensures a resilient food system for future generations.

- Conservation efforts have established designated zones where fish stocks are regenerating, ensuring long-term availability.
- Fisherfolk use sustainable and efficient methods, such as improved nets and boats, to maximise yield without depleting resources.
- A cargo ship symbolizes growth in trade opportunities, connecting Lake Turkana's resources to wider markets.
- A handshake symbol reflects collaboration among local fishing communities, policymakers, and conservationists. This ensures the preservation of ecosystems, balancing fish stocks with biodiversity protection.
- The peace sign highlights reduced conflict and improved security in the region, fostering economic growth and social cohesion.
- Accessible education and healthcare services empower local families and promote healthy lifestyles.
- A woman holding fish and vegetables symbolizes improved food security and access to nutritious diets.

SCENARIO 2:
Ticking Timebomb

High level of fishery sector growth, low degree of benefit sharing, low extent of natural resource sustainability and climate resilience.

This scenario portrays an unsustainable and inequitable food system driven by unregulated external exploitation and commercial interests. While short-term profits grow, local communities bear the costs through resource depletion, loss of livelihoods, and rising inequality. The situation is a "ticking timebomb," as the lack of inclusiveness in the fish value chain and poor environmental stewardship threaten food security, peace, and stability.

- There are big investments in the fish value chain. Industrial scale fishing dominate the waters, symbolizing foreign commercial interests that prioritize profit over sustainability. Post harvest losses are reduced due to investments in cold storage.
- Smoke-filled skies, overcrowded waters, and degraded land reflect the environmental impact of unsustainable, unregulated fishing practices.
- A drone hovering overhead symbolizes the advanced technologies brought in by foreign investors. While these tools improve efficiency in monitoring and extraction, they remain inaccessible to local fisherfolk.
- There are unchecked open-access agreements that favor external investors, intensifying inequalities.
- Buoys marked "growth," "investment," and "profit" float disconnected from local needs, illustrating how economic benefits fail to trickle down to the community. Local fisherfolk and community members hold signs like "Spare Our Lake!" and "What about us?" highlighting their exclusion and frustration as they struggle to access resources. A grounded fishing symbolizes loss of livelihoods.

SCENARIO 3:
Short Gain, Long Pain

High level of fishery sector growth, high degree of benefit sharing, low extent of natural resource sustainability and climate resilience.

In this scenario, local communities are included in the benefits of a growing food system. However, this scenario highlights the dangers of prioritizing short-term economic gain over sustainable resource management. Unsustainable fishing practices lead to resource depletion and the lake faces an irreversible "long pain", impacting future generations.

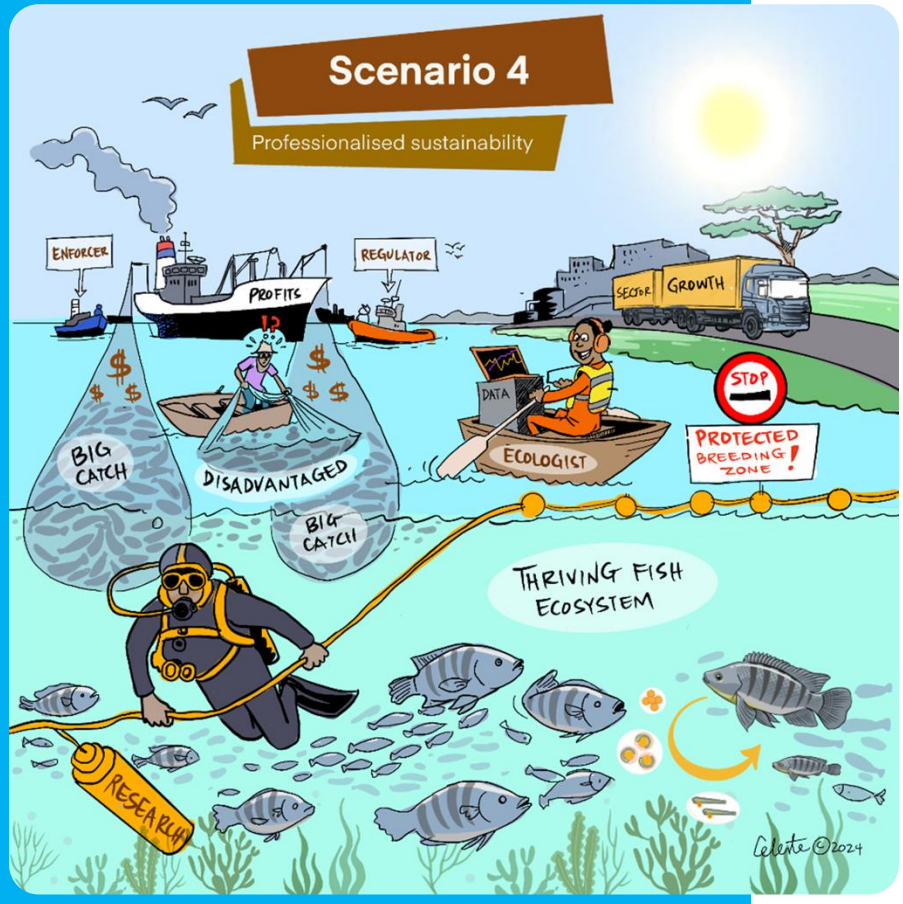
- Pipelines marked with dollar signs channel profits into "*Benefit Sharing*" and "*Growth*," representing reinvestment in the local community and the development of the fishery sector. The gains include improved incomes, fish consumption and nutritional status for the communities. For the fish sector this means advanced fishing methods and technologies, and improved infrastructure such as cold chain storage.

- Local fisherman, along side large industrial ships extract fish at unsustainable rates while prioritizing financial gain over long-term health of the lake.

- Despite these gains, the lake shows signs of distress. Water levels drop due to overuse ("Siphoning"), and fish stocks show depletion as commercial activities intensify. The lake is visibly polluted with floating waste. Fish swim frantically ("RUN"), highlighting an impending ecological tipping point.

SCENARIO 4:
Professionalised Sustainability

High level of fishery sector growth, low degree of benefit sharing, high extent of natural resource sustainability and climate resilience.

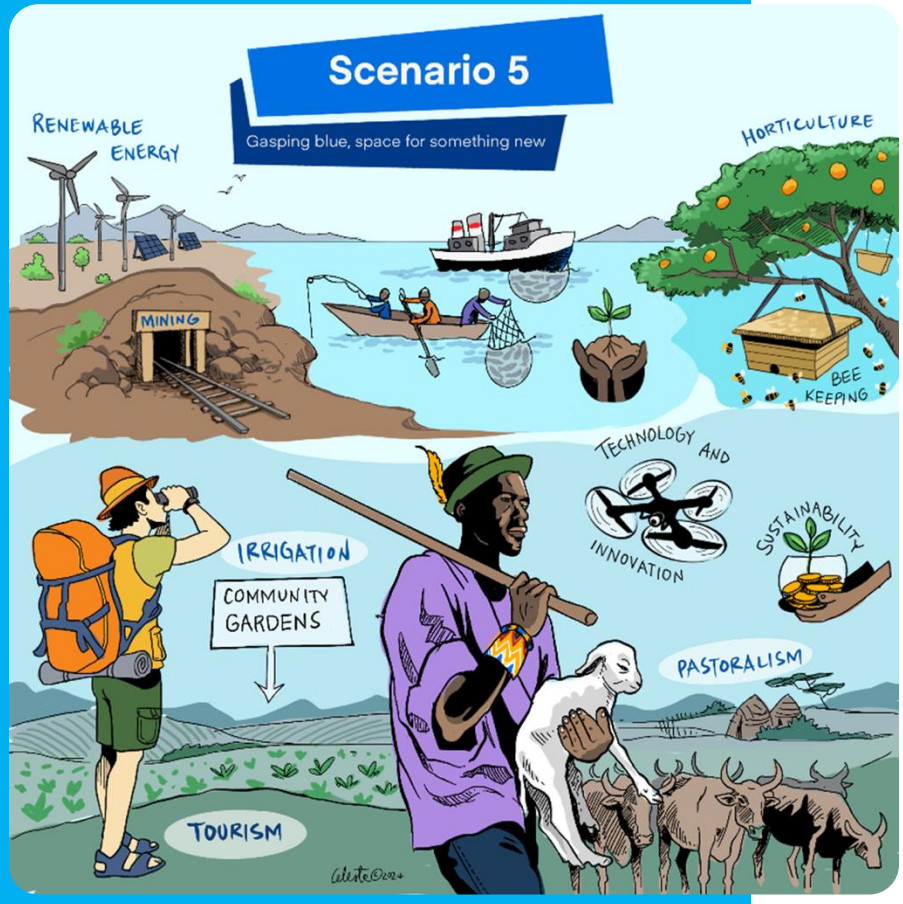


In this scenario, the Lake Turkana fishery sector experiences high growth driven by professionalized management, advanced technologies, and strong ecological protections. However, benefits remain concentrated, leaving local communities with limited gains despite a thriving, climate-resilient resource.

- In a visibly healthy lake, large and diverse fish populations swim through clear waters. Protected breeding zones are well-maintained, ensuring long-term stability of fish stocks.
- A truck labelled *"Sector Growth"* and ships labelled *"Profits"* symbolise the booming fishery industry, dominated by large-scale operators who benefit from big, high-value catches and export opportunities.
- An ecologist monitors data, and a diver conducts underwater research representing scientific investments that drive innovation in sustainability. Enforcement and regulation keep the ecosystem protected. However, these measures prioritise long-term resource health over local community inclusion.
- A visibly disadvantaged fisherman in a small boat struggles alongside the large nets of industrial operations, highlighting inequitable access to the fish stock. Despite sectoral success, the local community remains on the margins, with limited improvements in livelihoods.

SCENARIO 4:
Gasping Blue, Space for Something New

Low level of fishery sector growth, high degree of benefit sharing, high extent of natural resource sustainability and climate resilience.



This scenario demonstrates a future where natural resource sustainability and climate resilience support growth in diversified livelihoods. The result is a resilient and equitable food system that protects both livelihoods and the environment, as well as providing diverse diets.

- Fisherfolk in small boats highlight a limited reliance on fishing, with catches managed at sustainable levels to preserve the lake's ecosystem. Poor markets for fish leave fishing less economically viable, reducing incentives to remain in the sector. Power shifts to cartels and middlemen, who dominate the remaining fish trade and control prices, leaving fisherfolk disadvantaged. Unfavourable policies for fisheries fail to revitalise the sector, though policies prioritise the health of the lake ecosystem and biodiversity conservation.
- The communities around the lake revert to diversified alternative livelihoods: climate smart agriculture including fruit trees and irrigated community gardens, bee-keeping, pastoralism that is responsive to the environment, poultry and eco-tourism promoting natural resource conservation. These initiatives are community led, and benefits are shared.
- Wind turbines and solar panels reflect investments in the renewable energy sector.
- A drone symbolises the use of technology for the protection of land and water bodies, improving sustainability and resource planning.
- Stability and peace allow for safe movement, trade, and growth in alternative livelihood activities.

SCENARIO 4:
Darkness in Life

Low level of fishery sector growth, low degree of benefit sharing, low extent of natural resource sustainability and climate resilience.

This scenario paints a bleak future where the Lake Turkana food system collapses. The drying lake and environmental degradation push families into poverty and migration, while exploitation and social instability threaten peace.

- The drying lake is littered with abandoned boats and fish skeletons, symbolizing the collapse of the fishery sector.
- Cracked, barren land and tree stumps reflect the ecological devastation caused by unsustainable resource use and climate shocks.
- Tired and burdened families with livestock, and minimal belongings walk across the dry landscape, representing forced migration as livelihoods fail. An airplane symbolizes migration out of the region. The exodus of communities left without options leaves homes and livelihoods abandoned.
- Tensions rise and conflict increases as communities compete for the scarce remaining resources.

5.4. Scenario implications

After developing the scenarios, participants were encouraged to "stand in other stakeholders' shoes" and reflect on which scenarios might be most desirable or undesirable for each stakeholder group workshop participants were engaged in exploring the implications the different scenarios for different stakeholders and their interests. For example, what might the different scenarios imply for a poor women involved in fish processing, or a wealthy external investor. The implications for all the different stakeholder groups, and society at large were discussed. This illustrated that different stakeholder will likely perceive their interests better served in some scenarios rather than others. This then enables a deeper understanding of how political economic interests and power dynamics may be creating enabling or constraining factors in moving in particular directions.

Workshop participants were also asked about which scenarios they saw as being most desirable for the lake community as a whole and which scenarios they thought were more or less likely to occur. Interestingly they almost unanimously felt that the more desirable scenarios were the least likely to occur. They saw that current trends were pushing towards greater inequality, bigger environmental problems and more conflict. This highlighted the need for collective understanding and action to bring about the systems change needed for more desirable futures

6 A DEEPER LOOK AT THE LAKE TURKANA FISH VALUE CHAIN

A deep dive into the Lake Turkana fish value chain was essential to address its complexity (Box 6). There are numerous stakeholders with varying roles and perspectives, for instance, fisherfolk often do not own the fish they catch, as equipment and rights are controlled by others, and the fish moves through diverse markets—local, regional, and international. Conflicting figures on catch volumes, fish prices, local consumption versus export, and economic potential underscored the need for clarity, validation and a shared understanding.

An appreciation of the differing perspectives and priorities of various stakeholders was an important foundation for the Theory of Change (ToC) workshop. To achieve this, a full day of the workshop was dedicated to collectively visualizing the entire value chain, identifying interconnections, bottlenecks, and gaps, and fostering alignment among participants – before going into the design of interventions (Box 6).

This participatory approach to value chain mapping complemented and was informed by the value chain mapping being done by KEMFRI.

Box 6: How to do participatory value chain mapping in a workshop

A large framework of the value chain is created on the wall, with headings for the different parts of the value chain – inputs, fishing, collection, wholesale, retail, and consumption. Two additional layers are added below, one for institutions (including policy laws and regulations), and another for service provision (including logistics, finance, research and technical advice).

In dialogue with workshop participants as much information about the value chain as possible is added using sticky notes. Participants are asked to draw on their own knowledge and on data and information from research and government reports.

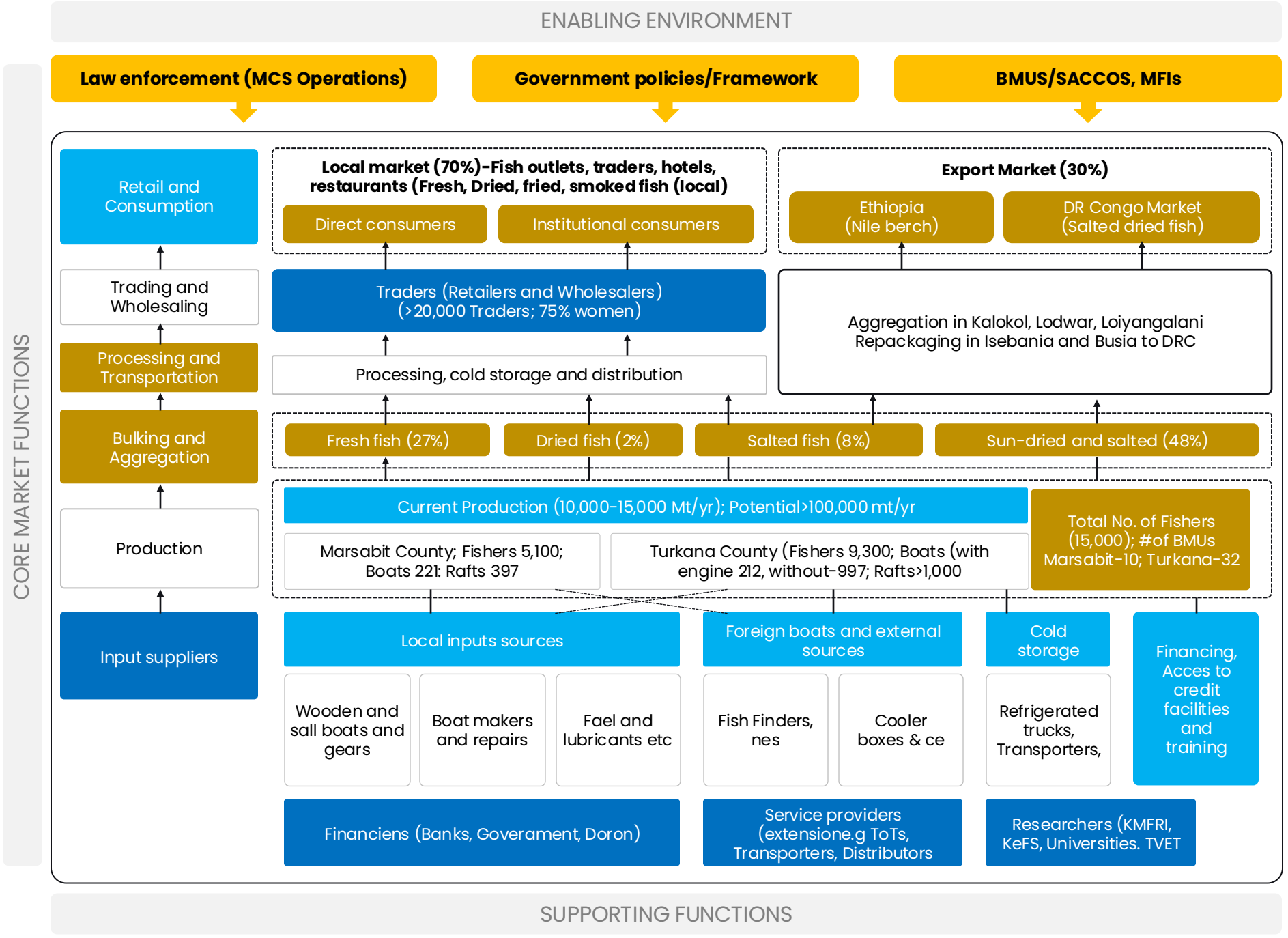
Participants identify challenges and bottlenecks at each step of the value chain, guided by thought-provoking questions from facilitators. These questions can explore who benefits from the value chain, who may face exploitation, and how power and inequity shape the system. This process promotes a deeper shared understanding of the dynamics within the value chain and highlights opportunities for intervention.

6.1. Insights into the Lake Turkana fish value chain

Figure 7, based on the 2024 KMFRI study on *Lake Turkana Systems Analysis of the Fish Value Chain*, provides an illustration of the overall value chain. During the workshop a similar figure was created by participants on the wall of the workshop room.

The discussion illustrated the complexity of the value chain in terms of the diversity of fish products, range of different actors, and differing domestic and international markets.

Figure 7: Fish value chain Lake Turkana (source KEMFRI)



Turkana Fish Value Chain key insights and challenges captured in value chain mapping exercise

Fishing

- Fishing on Lake Turkana reflects a highly stratified system involving diverse methods, unequal access to equipment.
- Fishing on Lake Turkana employs a variety of methods: raft fishing (25% of the catch, exclusively by men), canoe or dugout fishing (8%, primarily in the northern Illeret area), sail or oar-propelled fishing (45%), motor-propelled boats used mainly by collectors (20%), and foot fishing, the least resource-intensive method used by the poorest, contributing 3% of the catch.
- Ownership of fishing equipment is predominantly male, with 70% owned by men and 30% by women. There is a service industry that rents out equipment such as motorized boats. Most fisherfolk lack the capital to own their equipment; even foot fishers do not own their nets. Generally, 50% of the catch goes to the boat owner, who also takes all the fish initially before extracting expenses. The value of fish doubles by the end of the retail process.
- Most fishing occurs near the shore, with 70% of the catch coming from these areas. This is primarily because the boats used cannot venture further into deeper waters. There is a future opportunity in deeper waters if technology permits.
- Fishermen make an average profit of 15,000 KSH per month, which is not enough to sustain a family.
- The fishing value chain is valued between 1.5B and 2B KES, with potential future values of 5B KES or even 10B KES. There is potential for 30,000 MT sustainable production from Lake Turkana. Currently, there is a production of 10,000 MT
- The productivity of the fishery follows a boom-bust cycle, with high catch rates during periods of rising lake levels and significant declines as water levels recede.

Collecting

- The collection stage integrates traders, cooperatives, and informal middlemen, demonstrating a decentralised yet vital system of aggregation and transport.
- In Marsabit, fish aggregation is done by traders, with BMUs and cooperatives providing storage. Women and marginalized groups are involved in the collection and aggregation process. In Turkana, collection is also handled by fish traders, with some involvement from BMUs and cooperatives. Boda-boda riders also play a role as middlemen, buying fresh fish in Kalokol and selling it in other markets like Lodwar and Kakuma. Some boda-boda riders act as agents, purchasing fresh fish on behalf of wholesalers and transporting it to them.

Wholesale

- Wholesaling is the most profitable stage of the value chain, driven by over 20,000 traders.
- Estimations of the loss experienced by the fishing sector of lake Turkana vary from 30% to 67% and are mainly attributed to limited (cold) storage option and local fish consumption.
- Traders, particularly wholesalers, make the most money. Most trading is done by individual traders. Dried fish traders are more profitable than fresh fish traders, with fresh fish wholesalers mainly being men (boda boda riders) and dried/processed fish wholesalers being evenly split between men and women.
- Traders from Turkana often fish on the Marsabit side but sell through Turkana due to a bigger market and lower transport costs.

Storage & processing

- The storage and processing stage in Turkana is shaped by limited investment due to irregular fish production and rising water levels, with processing primarily involving drying, salting, smoking, and frying, alongside the creation of various by-products.
- Fish is either sold a fresh fish, or processed as dried fish, salted fish, fried fish or smoked fish.
- Fish by-products are utilized in various ways: bones and scales are crushed and used as animal feed, while fish oil is processed in Marsabit. Fish skin is also repurposed, though specific uses are not detailed. Fish maw (stomach) is employed for medical purposes. There are emerging opportunities for utilizing by-products in areas such as chicken rearing.
- The irregular fish production disrupts the development of fish value chains and discourages private sector investment, as businesses struggle to maintain a consistent fish supply, particularly for fresh fish, which requires reliable availability to justify investments in cold chain infrastructure. During low production periods, many fish processing and cold storage facilities remain idle, making it difficult for investors to generate sustainable returns.
- Facilities near the shore, such as processing plants and storage units, are vulnerable to flooding during high water periods or become distantly removed from the lake during low levels, disrupting operations and increasing costs.

Retail

- The retail stage connects fish products to local and export markets, with fish outlets, traders, restaurants, and hotels serving diverse consumer bases.
- Retailers face the challenge of non-local traders prioritizing fish exports over local sales.
- The method of selling fish depends on the availability of a ready market, the type of fish, and market demand. Recent improvements in the fresh fish trade can be attributed to private sector companies introducing cold chain solutions.

Consumption

- Consumption is divided between local (domestic) and export markets, with 70% of fish products consumed and export markets in destinations like Ethiopia and DRC accounting for 30%.
- Fishermen consume fish during expeditions, but their families rarely receive any, as the catch is typically handed to the boat owner unless the family is nearby. The further one moves away from the lake, the lower the fish consumption. Local consumption primarily consists of fresh fish.
- Future demands and needs are likely to increase due to a population boom in Turkana and Marsabit, coupled with challenges faced by pastoralists seeking alternative opportunities. As economies expand and urbanization progresses, there will be a higher demand for fish. This scenario presents fertile ground for exploitation, making equity a crucial factor in the design of future programs.

Gender dynamics

- Men dominate fishing activities, with most being youth under 35 years old, women still play a significant role, particularly in collecting, aggregating, processing, and trading fish.
- Women are increasingly owning boats (and renting them out to fisherman), but generally ownership of fishing equipment is primarily male-dominated
- Women, youth, and marginalized groups are involved in collection and aggregation
- Fresh fish trading is predominantly handled by men (such as boda-boda riders), while dried fish trading, which is more profitable, is evenly split between men and women.
- There are some woman groups involved in wholesale cooperatives.

Positive developments

- Enhanced road networks (Lappset, Kura), solar mini-grids for cold chains, digital platforms (e.g., Value Villages), increased motorization of fishing gear, increased use of boda boda for transport, are boosting efficiency and market access.
- Women's ownership of boats, youth involvement in processing and wholesaling, cooperatives, savings groups, and financial literacy programs are strengthening participation of women and youth in the value chain.
- Expanding markets (refugees, Congo), better cold chain management, higher local fish consumption, and SBCC efforts are increasing demand, and improving prices.
- Fisher service centers are being established

6.2. Perspectives on different value chain actors

The fish value chain analysis enabled the creation of personas for key stakeholders, including mobile and stationed fishermen, boat owners, and traders. This approach "gave face" to those active in and reliant on the fish value chain, highlighting their unique roles, lifestyles, and challenges. By humanising the system, the personas helped participants understand the diverse challenges, interdependencies, and motivations of these actors, providing to inform more inclusive and effective interventions.

The personas are depicted in Figure 8.

Figure 8 Personas of stakeholder in the Turkana Fish Value Chain

User Personas - fisherfolk

FISHERMAN - ON THE MOVE

Profile & Background

- Mostly Youth
- No Family
- Living far away from their families

Lifestyle

- Migratory nature: moving from shore to shore, boat to boat, depending on ad hoc work opportunities
- Many has no money at the end of the day
- "Catch fish - eat - repeat" lifestyle

Challenges

- Does not own livestock
- Exclusively relying on fishing as a livelihood source
- No savings of any kind - out of money by the end of the day
- Not looking at fishing as a business opportunity
- Not owning equipment, need lower input prices to access inputs

FISHERMAN - STATIONED

Profile & Background

- Live in the areas, close to the shore
- Owns some livestock

Lifestyle

- Could own a few livestock
- Does not own boats or fishing gear
- Does some processing of the fish before selling: drying

Challenges

- No access to fishing equipment -need lower prices to access
- No business acumen /financial literacy

User Personas - fisherfolk

BOAT OWNERS

Profile & Background

- 30% women, 70% men
- Often from religious groups
- Many used to be fishermen

Lifestyle

- Main source of income: renting boats and fishing gear to the fishermen
- They take 50% of the catch
- Sell the fish, mostly dried
- Own livestock
- Reinvest their profit from boat renting and fish sales into livestock

Their impact on the ecosystem

- Many brought positive changes to the region by providing livelihood opportunities by renting equipment
- Some others are exploitative towards fishermen

TRADERS

Profile & Background

- Often overlap with Boat Owners
- Many used to be fishermen

Lifestyle

- Own livestock and reinvest their profit into livestock
- Entrepreneurial skills and business mindset
- They do processing of the fish: some are drying, some are salting, some freezing fresh fish
- No mechanized processing as they don't have enough capital to set it up

Their impact on the ecosystem

- They determine the market price
- Buying price of local fish is often very low
- Prices paid for fisherman often so low, it is not enough to sustain proper livelihoods
- Selling price: much higher profit stays with the traders

7 DEVELOPING A SYSTEMIC THEORY OF CHANGE

The insights from the systems mapping, value chain analysis and scenario development were brought together to refine the vision and objectives of the programme, develop a systemic theory of change, and outline key intervention areas.

The approach used to develop a systemic theory of change is inspired by Soft Systems Methodology[6] with a focus on the "human activity systems" (processes) needed to shift the system in a more desired direction.

7.1. Shared vision and collective ambition

To develop a shared vision and collective ambition for the programme the "CATWOVE" approach (Box 7) from Soft Systems Methodology was used to clarify the intended systems transformation.

Participants were divided into seven groups and asked, "If the programme is successful, what would you see transformed?" Each group identified what they saw as the critical transformation and discussed all the other aspects of "CATWOVE".

Box 7: The CATWOVE framework from Soft System Methodology

- **C** — **Customers:** who (or what) benefits from this transformation
- **A** — **Actors:** who facilitates the transformation to these customers
- **T** — **Transformation:** from "start" to "finish"
- **W** — **Weltanschauung/Worldview (Values):** what gives the transformation some meaning.
- **O** — **Owner:** to whom the "system" is answerable and/or could cause it not to exist
- **E** — **Environment:** that influences but does not control the system[6]

[6] Checkland P.B. (1981), Systems Thinking, Systems Practice, Wiley, London.

The reflections on the customers, actors, transformation, worldview, owners and environment were then used to formulate the main transformations for the programme, see figure X below.

Economic context

Current Situation	Transformed Situation that the Program will contribute towards
Underutilized and inadequately managed fisheries resource with a fragmented, inefficient, under-invested and often exploitive value chain in an area of high levels of poverty and poor nutrition where communities are highly vulnerable to climate change and conflict and violence is increasing, and there is limited knowledge and research about the environmental and social dynamics	Expanded, efficient, sustainable, inclusive and equitable fish value chain (fishing, aggregating, processing, wholesaling, retailing)
	Local wealth creation from the fish value chain assisting people to escape poverty and have more diverse and resilient livelihoods
	Stewardship of lake natural resources by all value chain actors is protecting environmental services, and enabling sustainable and climate resilient productivity of the lake fisheries
	Households in lake environs being able to consume healthy and affordable diets underpinned by benefits from the fishing sector
	Evidence based and participatory governance leading to environmentally and socially responsible practices by value chain actors and resource users, supported by monitoring and citizen science
	Conflicts being managed and trusting relations built for peaceful community co-existence and effective cooperation between value chain actors

The vision statement outlined in the project proposal was revisited in light of the newly established consensus on the required transformations. Participants recommended incorporating references to environmental sustainability, inclusivity, and wealth creation within the framework of the Blue Economy. The revised vision and approach, reflecting these priorities, are presented below.

Vision

To create sustainable, climate-resilient livelihoods that ensure food and nutrition security, inclusivity, economic stability and wealth creation for the people of Marsabit and Turkana Counties, while preserving the environmental health of Lake Turkana.

Approach

Adopt a systems approach that places the people of Lake Turkana at the center of enhancing the fish value chain.

7.2. Leverage points for systemic change

To help in taking a systems view an overall map of the key sub-systems of human activity needed to bring change, and how they interact, was developed. This helped workshop participants keep a big picture perspective on critical relationships as they identified and developed key intervention pathways, see Figure 8.

Figure 8: A systems view of investing in the future of Lake Turkana

Vision from scenario 1: paradiso

Warning from scenario 6: darkness in life

Pressure from pastoralist communities

Pillar 3: Nutrition and food security

5 Healthy food and nutrition behaviour in households

- Nutrition knowledge and behavior change
- Diverse diets
- Healthy food environ-ments

Cross-cutting Pillar: Conflict management and gender inclusion

6 Peace and stability

Constructive Inter-ethnic / multi-stakeholder relations

- Inclusive community leadership
- Gender inclusion
- Peace-building mechanisms

Food access and stability

Level of benefit sharing

Household income

Warning from scenario 2: ticking timebomb

Commitment and energy

Peace dividends

Peace to utilize resources

Pillar 1: Climate-resilient livelihoods and fisheries value chain

1 Fisheries value chain benefits

- Product value addition and sales to profitable markets
- Functioning market information system
- Improved fisherfolk practices and organisation

Savings

Quality of lake resources

Pillar 2: Integrated resource management and knowledge

3 Stewardship of natural resources

- Circular economy
- Water quality
- Community Environmen-tal conscious-ness

Shared responsibility

Insight from scenario 4: professionalised sustainability

Resource use

Investments

2 Local wealth creation around the Lake

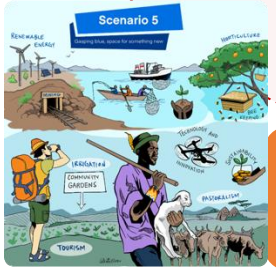
- Access to finance
- Boat and equipment quality and access
- Energy provision and tech for fresh fish quality

Knowledge investment

Informed strategies and policies

4 Evidence base and natural resource governance

- Multi-stakeholder coordination
- Data valued by stakeholders
- Effective policy making



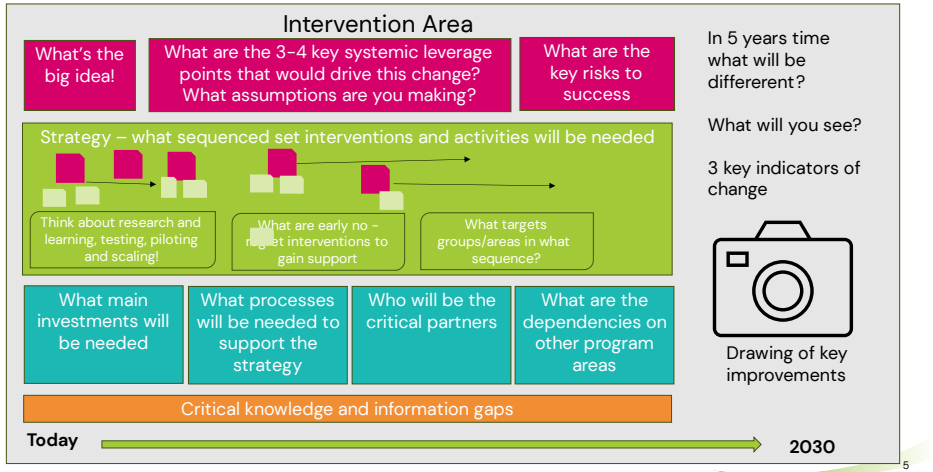
Keep an eye open for opportunities as in scenario 5: gasping blue, something new

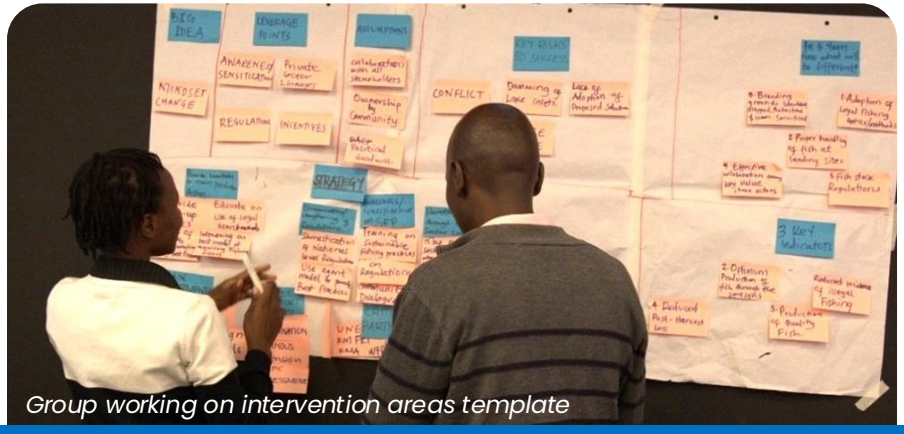
Warning from scenario 3: short gain long pain

7.3. Intervention pathways

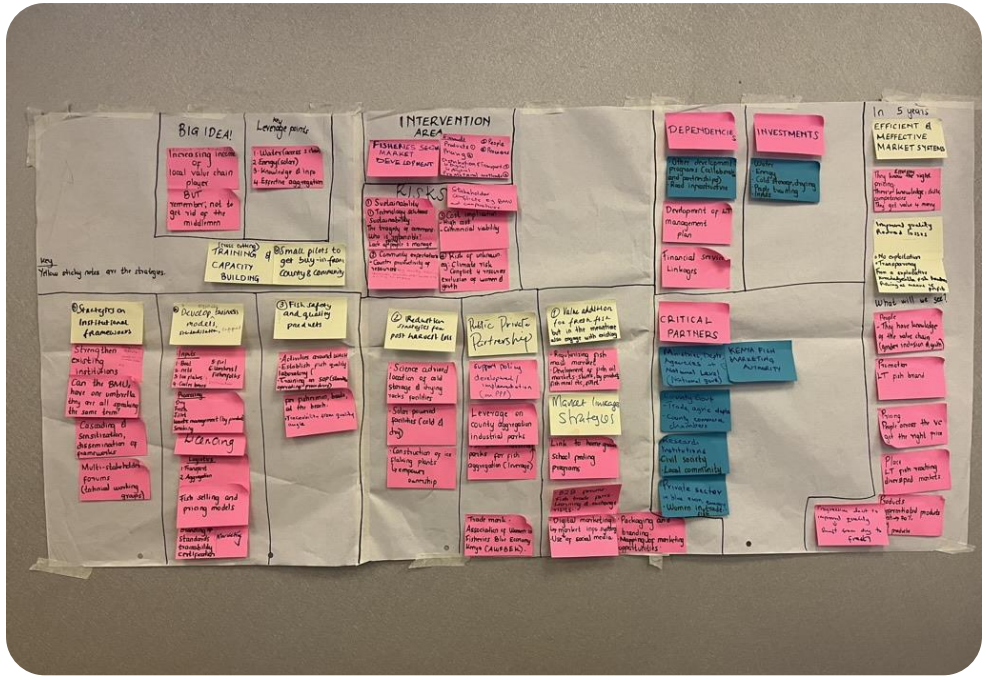
The ToC, key transformations and causal loop maps were instrumental in identifying intervention areas within the programme's three pre-set pillars. Following the validation of the programme's pillars and intervention areas, participants were organised into groups to design specific, actionable strategies, using a structured template (see Figure 9 below). The groups presented their work, and the other participants were asked to assess the interventions through the lens of key design principles. The focus was on whether the proposed strategies tackled systemic challenges, promoted sustainability (including resilience to climate variability), ensured equity and inclusivity, and upheld commercial viability.

Figure 9 Template intervention area





Group working on intervention areas template



Group working on intervention areas template

By the second ToC workshop, additional evidence had been gathered from the background research studies:

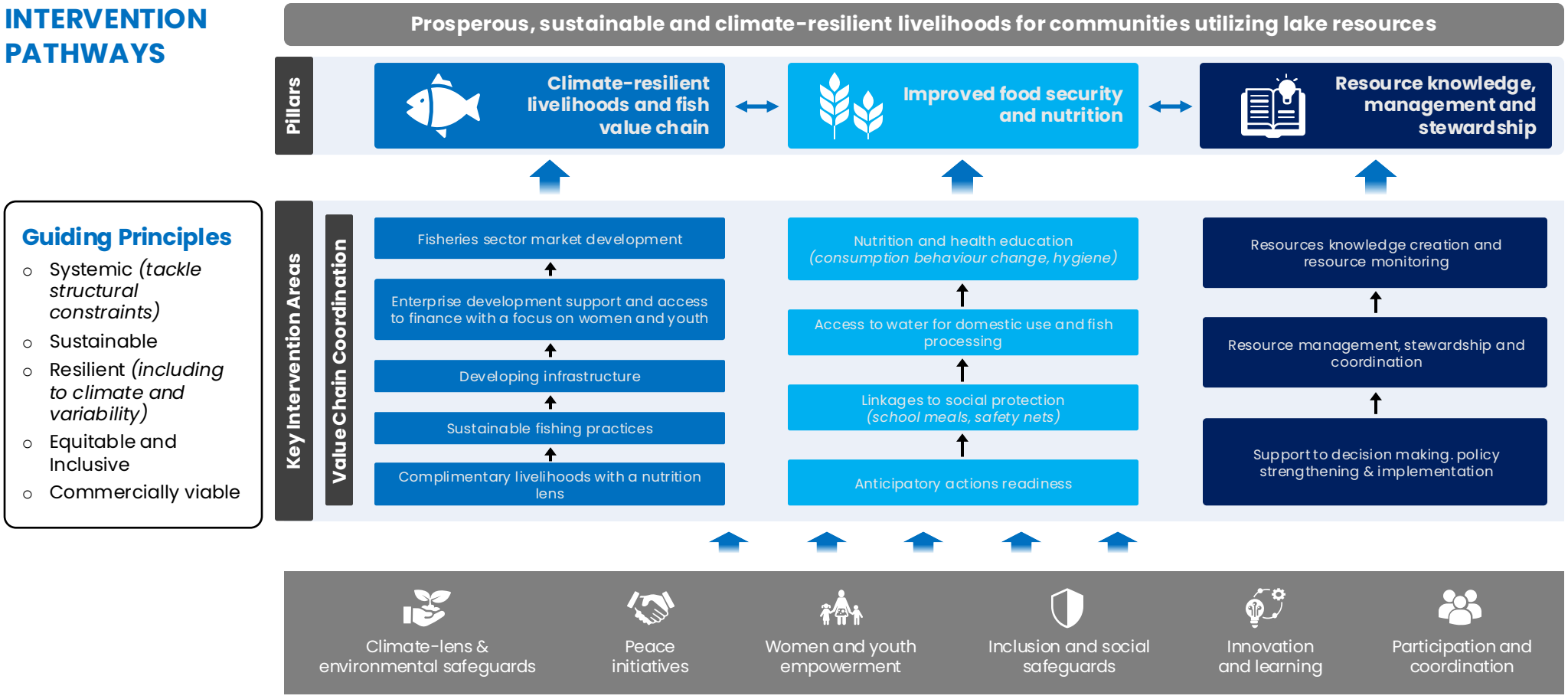
- Lake Turkana Systems Analysis of the Fish Value Chain – Presented by KMFRI
- Climate Variability and Violent Conflict in Marsabit and Turkana Counties – Presented by International Alert
- Formative Assessment for SBC to Improve Healthy Diets through the Fish Value Chain in Turkana and Marsabit – Presented by CBCC
- Assessment of Water (In)security – Presented by Strathmore University
- Systems Mapping and Economic Analysis: Lake Turkana Fisheries Sector – Presented by Padeo

Participants reviewed and provided feedback on these studies, and used the insights of the studies to refine and validate the intervention areas. Some interventions were reformulated, while others were added to better align with the emerging evidence and gaps identified in the studies. Participants were also encouraged to reflect on cross-cutting issues, including conflict resolution and peacebuilding, the inclusion of women and girls, youth engagement, community development, and the broader political economy in the target area. Following the presentations, participants wrote their insights and suggestions on sticky notes, which were then added to the flipcharts.

The outcomes of this exercise were directly integrated into WFP's inception report, providing a detailed roadmap of leverage points, strategies, intervention sequences, key partners, processes, and priority actions for the project's first year of implementation.

Figure 10 shows the Final set of intervention areas as included in the WFP inception report.

Figure 10 Final set of intervention areas as included in the WFP inception report



7.4. Adaptive programme management

The underlying assumption in a systemic approach to theory of change is that it is impossible to consider all possible future contingencies, nor to adequately understanding what strategies and actions may be most effective in delivering on the programme's goals. This means that programme implementation must be learning oriented and highly adaptable and flexible. While broad directions, ambition, and indicative indicators can be set in the design phase much of how a programme will operate needs to be developed as it unfolds. Essentially an entrepreneurial way of operating.

Adaptive programme management requires skilled leadership and stakeholder management. Good monitoring of both quantitative and qualitative indicators is needed coupled with in-depth analysis of why there is success or failure. There must be a willingness to try things out - accepting that failure is part of innovation and learning – and then to scale what is working, and quickly stop what is not working. For such processes to work there must be very good communication between all those involved in a programme, high levels of trust, and effective processes of collective analysis and decision making.

8 REFLECTIONS ON THE FORESIGHT PROCESS

The foresight process employed during the inception phase of this project proved to be both innovative and highly collaborative, enabling diverse stakeholders to collectively envision the future of the Lake Turkana food system. Participants described the process as unique, emphasising its ability to foster dialogue across sectors and levels, from community consultations to national roundtables. This inclusivity allowed for a breadth of perspectives to be integrated into the analysis, laying a strong foundation for shared ownership of the programme.

> *I truly value the approach of bringing together people from different sectors. Uniting diverse perspectives in the plan, building on their unique strengths, and drawing from a wide range of ideas has been incredibly impactful.*
>
> *Mika Mitoko, Project manager Lattice*

One of the most important aspects of the foresight process was its emphasis on a long-term vision, looking 15 years or more into the future. This was critical for ensuring that investments would remain relevant and impactful over time. Stakeholders frequently referenced past investments in Lake Turkana that failed due to a lack of consideration for the region's evolving context. By focusing on sustainable, future-proof solutions, the project aligns with its donor's long-term vision, as current funding spans five years with the potential for a further five-year extension.

Stakeholders explored both key trends and critical uncertainties that could significantly shape the future of the Lake Turkana system. These discussions encouraged participants to reflect on how the future might unfold and the implications for their shared vision and ambitions. This adaptive approach allowed stakeholders to consider multiple pathways for sustainable development in the face of uncertainty.

> *Foresighting is an important way of understanding, from the beginning, where we are and what challenges might lead to failure. It allows us to look into the future and develop strategies and plans that enable success. We formulated six scenarios, some involving better management strategies and sustainable fisheries where all stakeholders benefit. Other scenarios highlight risks, such as climate change and dwindling catches. Foresight helps us navigate these possibilities.*
>
> *Ivans Lomodei (Chief Officer for Fisheries and Aquaculture Turkana)*

Stakeholder engagement was central to the process, with input collected through multiple avenues, including community consultations, multi-stakeholder fora, workshops in Nairobi, and background studies employing participatory tools such as focus group discussions. Every step of the foresight framework revisited these insights, ensuring they informed the development of scenarios, the systemic theory of change and eventually the intervention strategies.

> *We conducted research as part of this project, and identified pain points. When you think about fisheries, the value chain, and economic development, it's important to consider contextual dynamics and inter-group tensions—those factors that could ultimately lead to programme failure. I have seen people use the findings from the research to think about the context, not just about what we implement. It's about understanding what the research tells us about people and how they relate to one another.*
>
> *Emmy Auma Odero (Head of International Alert Kenya and Horn of Africa)*

The use of visual tools, such as rich pictures, causal loop diagrams, and visualised scenarios, was a standout feature of the foresight process. These tools helped simplify complex ideas, foster clearer communication, and deepen participants' understanding. Many stakeholders highlighted the six visualised scenarios as particularly memorable, noting how they evoked emotional responses and a shared sense of direction for the future.

The value chain mapping exercise was another powerful component of the process. Participants frequently remarked that, despite living near Lake Turkana or working in the fisheries sector, they gained new insights into the complexity of the value chain. The exercise also revealed how different stakeholders perceived the value chain's challenges, sparking rich discussions.

Challenges

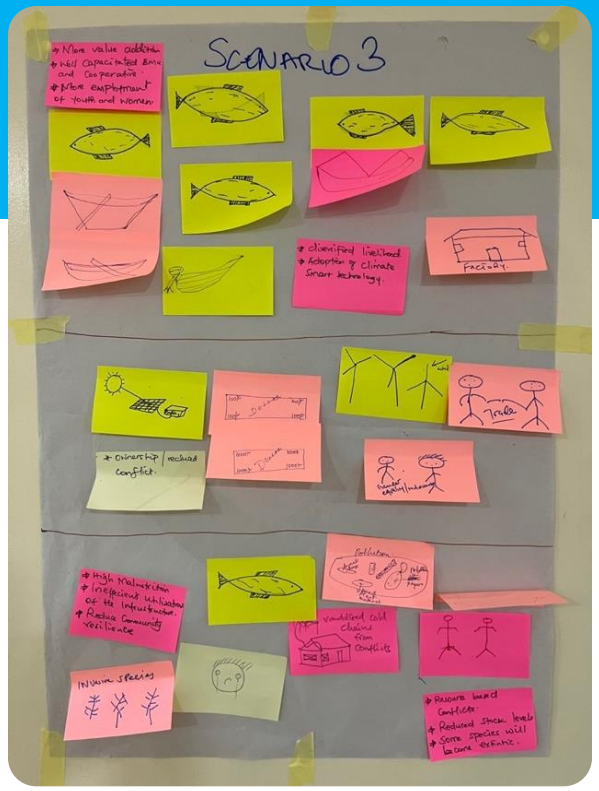
While the foresight process yielded valuable outcomes for the programme design, there were also some challenges:

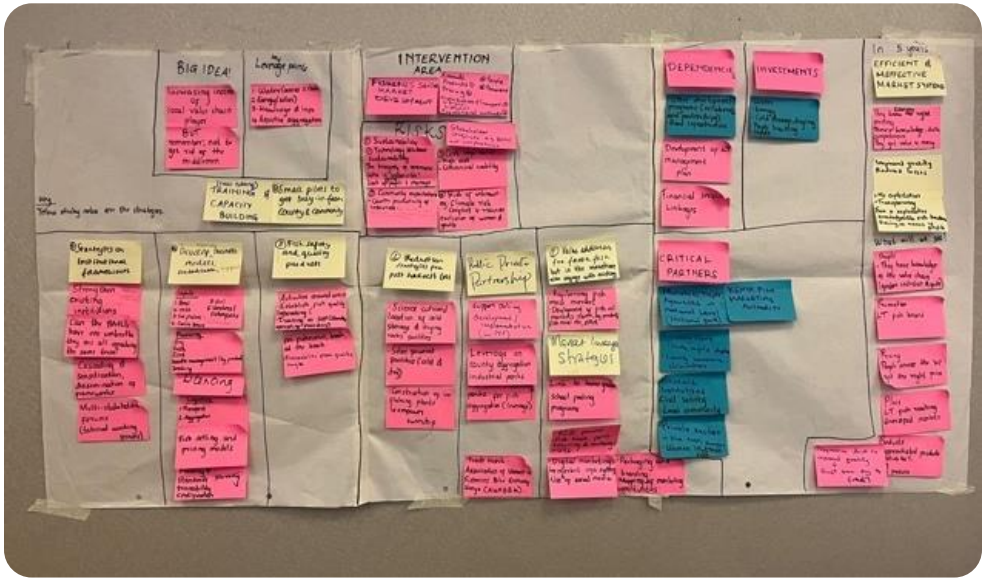
- Coordinating consortium partners and stakeholders at national and county levels required significant time and effort, particularly to ensure the right participants were involved. On some occasions stakeholders could not avail themselves for the full duration of the workshops.
- At the start of the inception phase, there was limited economic data on the fish value chain and limited data on fish populations and potential for fisheries in Lake Turkana. While valuable data emerged later in the process from commissioned studies, having this information earlier would have further enriched the discussions and outputs.
- The foresight approach was unfamiliar to most participants, requiring active engagement and a willingness to think outside their sectors and comfort zones. Although some exercises took time to gain momentum, participants became highly engaged once they grasped the process.
- Language barriers posed challenges, as some participants were not comfortable in English, and not all facilitators spoke Swahili, potentially leading to missed nuances on both sides.

> *Looking into the various possible scenarios, both in positive and negative ways, and identifying the drivers to bring about positive change, you could see that the stakeholders in the room were engaged from the very first second. They shared their views very openly, very transparently, and brought all their issues to the table. Unless we know what the issues are, we cannot make an impact*
>
> *Claudia Apoe (Head of Climate Resilience and food systems WFP Kenya)*

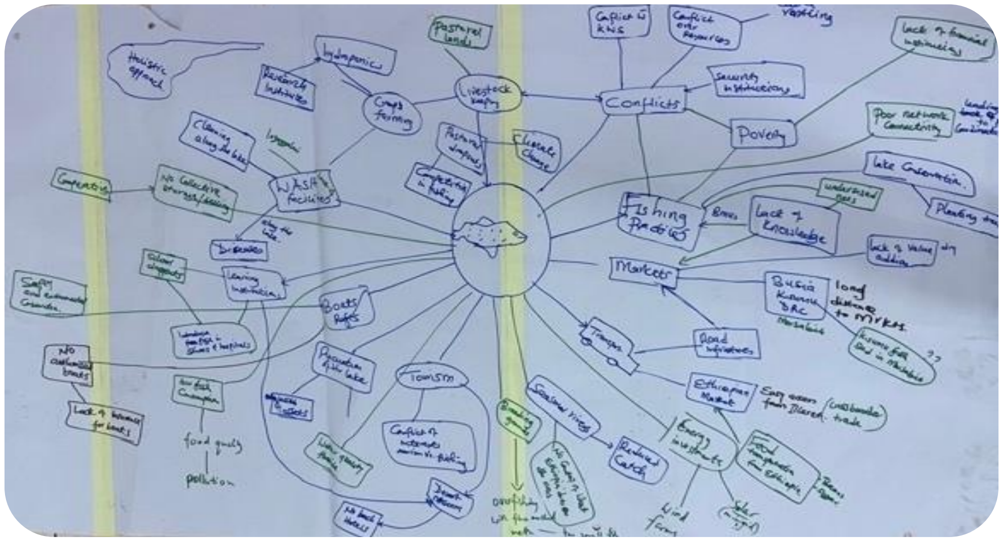
9 LIST OF PARTICIPATING ORGANIZATIONS AND BUSINESS

- NGO Representatives:
- Arid & Semi-Arid Lands Initiatives for Environmental Conservation & Boat Builders
- Beach Management Units:
  - Eliye Springs
  - Iliret
  - Kalokol
  - Loiyangalani
  - Nairimat
  - Namikuse
  - Narewa
  - Nasichebuin
  - Todonyang
- Chiefs
- Community Members:
  - Elmolo
  - Iliret
  - Loyangalani
  - Muite
- County Government Marsabit and Turkana
  - Agriculture Office
  - Education Office
  - Fisheries Office
  - Health and Nutrition Office
  - Trade Office
  - County commissioners
- Cross Border Fish Traders Sacco
- Dry Fish Traders
- Embassy of the Kingdom of the Netherlands
- Ewaaso Water Company
- Farmers
- FISH Cooperatives
- Foresight4Food
- Frontier
- International Alert
- Lattice Aqua
- Local Administration
- Market Research
- Mercy Corps
- National Blue Economy department
- National Government Agencies:
  - Kenya Marine and Fisheries Research Institute
  - Kenya Fisheries Service
  - Kenya Wildlife Service
  - Water Resource Authority
  - Development
- Padeo
- Pastoralists
- Private Sector BU Value Chain Transformation
- Saccos (not just from the lake)
- Turkana Basin Institute
- Turkana Central
- Turkana Chamber of Commerce
- Turkana Council of Elders
- UNESCO
- USAID Nawiri
- WFP:
  - Innovation Unit
  - Marsabit Field Office
  - M&E
  - Strategic Outcome 2
  - Turkana Field Office


SCENARIO 3


BIG IDEA!
INTERVENTION AREA
RISKS
TRAINING
CAPACITY BUILDING
DEPENDENCE
INVESTMENTS
CRITICAL PARTNERS
Public Private Partnership
Market Linkage Strategy


Political Economy


Conflicts
Poverty
Fishing Practices
Markets
Tourism
food quality
pollution