The Netherlands Food Partnership (NFP)

Scoping Kenya's Water–Food System: Opportunities for Partnership and Sustainable Impact

FINAL REPORT

Submitted by:

Josiah Ateka (JKUAT), Forah Obebo (KU), and Mercyline Njeri (JKUAT)

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Acronyms

ASALs	Arid and Semi-Arid Lands
ASTGS	Agricultural Sector Transformation and Growth Strategy
CASSCOMs	County Agriculture Sector Steering Committees
CFAs	Community Forest Associations
NGOs	Non-Governmental Organizations
CSOs	Civil Society Organizations
CSA-MSP	Climate Smart Agriculture Multistakeholder Platform
FSA	Food Systems Approach
FOLU	Food and Land Use Kenya
HPLE	High-Level Panel of Experts on Food Security and Nutrition
ISFAA	Inter-sectoral Forum for Agrobiodiversity and Agroecology
JMP	Joint Monitoring Programme for Water Supply, Sanitation and Hygiene
KIFFWA	Kenya Innovative Finance Facility for Water
MSPs	Multi-Stakeholder Platforms
NFP	Netherlands Food Partnership
OECD	Organisation for Economic Co-operation and Development
SACCO	Savings and Credit Co-operative Organization
SUN CSA	Scaling Up Nutrition Civil Society Alliance
WASH	Water, Sanitation, and Hygiene
WASREB	Water Services Regulatory Board
WRUAs	Water Resources User Associations

Contents

1. Introduction

1.1 Background

Water and food systems are closely interdependent. Water is essential for food production, processing, distribution, consumption, and waste management, while food production and consumption influence water availability, quality, and sustainability. Despite this interdependence, water-related challenges such as scarcity, pollution, and inefficient management continue to constrain food system performance, while food system activities place additional pressure on the already stressed water resources (Ringler et al., 2022)[1].

Food systems comprise all the processes associated with food production and food utilization: growing, harvesting, packing, processing, transporting, marketing, consuming and disposing of food remains. All these activities require inputs and result in products and/or services, income and access to food, as well as environmental impacts (Van Berkum, Dengerink, & Ruben, 2018) [2]

A key barrier to improving water-food systems linkages is the lack of coordination among stakeholders across water management, food security, nutrition, and related sectors. Institutional fragmentation and siloed approaches often result in poorly integrated outcomes. These challenges are compounded by poor agricultural water management, food loss and waste, and limited availability of integrated water–food data (UN Water, 2021)[3]. Such gaps hinder progress on the priority action areas identified by the 2021 Food Systems Summit, including ecosystem restoration, food safety, access to nutritious diets, and climate resilience.

Consequently, climate extremes, rapid urbanization, land-use shifts, irrigation expansion, and changing diets are intensifying pressures on both water and food systems (FAO, 2021[4]; Perez et al., 2024[5]). Global water demand is projected to increase by 20–30% by 2050, rising from about 4,600 km³ to 6,000 km³ per year, largely due to expanding irrigation and manufacturing in low- and middle-income countries (Burek, et al., 2019)[6]. Poor water resource management has also contributed to catchment degradation, over-abstraction and encroachment of riparian and wetland zones.

Addressing these challenges requires stronger institutions, integrated governance, and coordinated action across sectors. Recognizing water as a cross-cutting connector, the Netherlands Food Partnership (NFP) supported a scoping study to identify opportunities to address water–food challenges in Kenya and beyond, responding to the growing demand for practical, policy-relevant solutions amid climate change, economic growth, and fragmented governance.

1.2 Purpose of the study

This scoping study examines the interactions between water and food systems to identify priority challenges and opportunities for integrated action. Using Kenya as a case, the study aims to; (1) identify key water–food system challenges from production to consumption; (2) examine governance and institutional bottlenecks that limited integration; (3) map stakeholders to reveal gaps and synergies; and (4) highlight practical opportunities for multi-stakeholder interventions informed by local lessons. The findings are expected to provide actionable insights for policymakers, development

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[1] Ringler, C., Agbonlahor, M., Barron, J., Baye, K., Meenakshi, J. V., Mekonnen, D. K., & Uhlenbrook, S. (2022). *The role of water in transforming food systems*. *Global Food Security, 33*, Article 100639. https://doi.org/10.1016/j.gfs.2022.100639

[2] Van Berkum, S., Dengerink, J., Ruben, R., 2018. The Food Systems Approach: Sustainable Solutions for a Sufficient Supply. Wageningen Economic Research, Wageningen. https://doi.org/10.18174/451505

[3] UN-Water. (2021). *Summary progress update 2021: SDG 6 – Water and sanitation for all (Version: July 2021)*. Geneva, Switzerland. https://www.unwater.org/sites/default/files/app/uploads/2021/12/SDG-6-Summary-Progress-Update-2021_Version-July-2021a.pdf

[4] FAO. (2021). *The state of the world's land and water resources for food and agriculture: Systems at breaking point. Synthesis report 2021*. FAO. https://doi.org/10.4060/cb7654en

[5] Perez, N., Singh, V., Ringler, C., Xie, H., Zhu, T., Sutanudjaja, E. H., & Villholth, K. G. (2024). Ending groundwater overdraft without affecting food security. Nature Sustainability, 7(8), 1007–1017. https://doi.org/10.1038/s41893-024-01376-w

[6] Burek, P. et al. (2019). Reassessing the projections of the World Water Development Report. npj Clean Water https://doi.org/10.1038/s41545-019-0039-9

partners, and private and civil society actors. They also aim to inform broader Dutch and international engagement, guiding investments and policies to strengthen sustainable water–food systems.

1.3 Policy framework for the water-food systems in Kenya

Kenya's water and food landscape is guided by a robust but fragmented policy framework that recognizes water as central to food security, resilience, and sustainable development. Key national instruments include the National Water Policy (2021), Water Act (2016), National Water Resources Strategy (2020–2025), National Irrigation Services Strategy (2022–2026), National Agroecology Strategy for Food System Transformation (2024–2033), Kenya National Agricultural Policy (2021), and the Agricultural Sector Transformation and Growth Strategy (2019–2029). These frameworks prioritize sustainable water management, irrigation, climate-smart agriculture, ecosystem restoration, and equitable resource allocation to enhance food security, nutrition, and productivity. They also emphasize integrated governance, capacity building, stakeholder engagement, and financing at both national and county levels.

Kenya's recent food systems transformation commitments further emphasize digitalization, climate resilience, youth and women participation, dietary diversity, and improved farmer productivity (United Nations Food Systems Coordination Hub, 2021)[7]. Implementation, however, remains fragmented across sectors and governance scales (national, sub-national, landscape and basin levels). Strengthening cross sectoral coordination linking water governance, ecosystem restoration, irrigation, and food supply chains offers a key opportunity to translate these policy ambitions into scalable outcomes.

The Dutch development policies and lessons from previous initiatives emphasize the need for integrated approaches and coordinated action across the water–food sectors. The 2026 coalition agreement of the minority cabinet of D66, VVD, and CDA ("Aan de slag – Bouwen aan een beter Nederland", 2026–2030) reaffirms continued investment in development cooperation and a commitment to move closer to the OECD (Organisation for Economic Co-operation and Development) target for Official Development Assistance. It prioritizes investments in youth, education, women's rights, global health, and food security, while linking development cooperation to global stability and strengthening the Netherlands' international position and trade. The coalition advances a modern aid-and-trade agenda that leverages Dutch expertise and builds equal partnerships, including through a broader Africa strategy.

Evaluations of Dutch support between 2016 and 2023 show that interventions are most effective when aligned with partner country priorities, embedded in long-term initiatives, and coordinated across agriculture, water, trade, and climate policies. Key instruments include the Dutch International Water Ambition (NIWA), KIA Landbouw Water Voedsel 2024–2027, and initiatives from the Ministries of Foreign Affairs (BHOS – Trade and Development Cooperation), Agriculture, Fisheries, Food Security and Nature (LVVN), and Infrastructure and Water Management (I&W). These frameworks promote circular and climate-adaptive agriculture, digital innovation, and public–private partnerships. They support a systems-oriented approach that links production, governance, and markets to strengthen food system resilience, rural livelihoods, and integrated water–food solutions.

1.4 Methodological Note

The study is framed within a water–food systems perspective, highlighting the complex linkages and feedback loops between water and food (HLPE, 2015[8]). As shown in Figure 1, water dimensions (availability, access, stability, and quality) directly influence food production, processing, distribution, preparation, and consumption, while food systems, in turn, affect water through extraction, pollution, and waste. This interplay shapes ecosystem health, nutrition and livelihoods, and is further influenced by socio-economic, institutional, and environmental factors.

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[7] United Nations Food Systems Coordination Hub (2021) *Kenya Food Systems Summit Dialogue Series: National Position Paper.* https://www.unfoodsystemshub.org/docs/unfoodsystemslibraries/national-pathways/kenya/2021-09-27-en-kenya-fss-dialogue-series-national-position-paper.pdf (Accessed: 9 March 2026).

[8] HLPE. (2015). *Water for food security and nutrition* (HLPE Report No. 9). Committee on World Food Security. https://www.fao.org/3/i5160e/i5160e.pdf

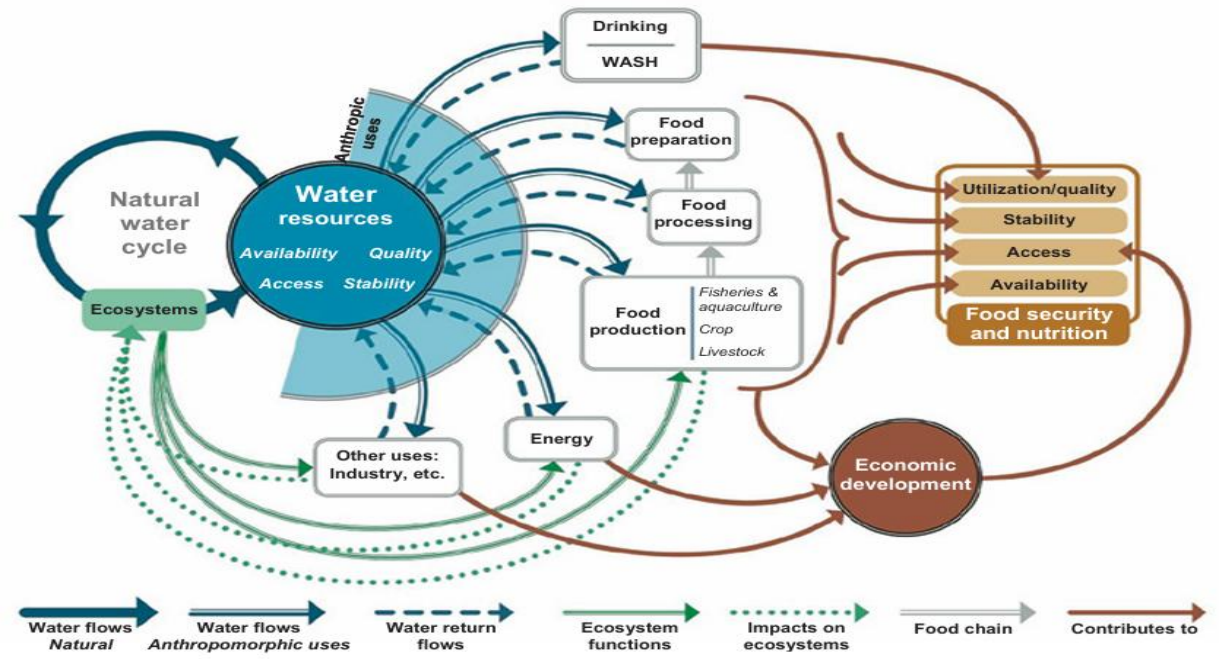

Figure 1: Water-Food system interactions (HPLE, 2015)

The Food Systems Approach (FSA) offers an interdisciplinary lens to understand these interactions, focusing on how production, processing, distribution, and consumption affect socio-economic, environmental, and climate outcomes (Van Berkum et al., 2018[9]). A key feature of the FSA is its emphasis on feedback loops, which illuminate trade-offs and the underlying drivers of water-food challenges. Applying this framework, the scoping study examines water–food system interactions in Kenya, identifying key challenges, governance gaps, water-quality constraints, and stakeholder interactions. It also highlights opportunities for multi-stakeholder collaboration and integrated interventions that enhance resilience and sustainability across the water–food system.

Based on the conceptual framework and empirical literature, we employed a mixed-methods data collection approach. Data were gathered from multiple sources, including document review and stakeholder consultations across policy, regulatory, research, civil society, and the private sector. We also conducted round-table discussions with over 15 Dutch-linked businesses to capture practical insights. In addition, site visits and focus group discussions (FGDs) with over 100 farmers and community leaders in Nakuru County provided insights into water–food system interactions and ongoing initiatives. Respondents were selected to capture upstream–downstream watershed dynamics, diverse livelihoods, ethnic diversity, varying market integration, climate and water vulnerability, and involvement of Dutch partners. Key informant interviews (KIIs) were also conducted with representatives from leading food systems multi-stakeholder platforms (MSPs) in Kenya, including the Climate-Smart Agriculture Multi-Stakeholder Platform (CSA-MSP), the Intersectoral Forum for Agrobiodiversity and Agroecology in Africa (ISFAA), and the Food and Land Use Coalition (FOLU), to capture perspectives on governance, coordination, and implementation of water-food systems (Annex 1 presents list of interviewed stakeholders).

Following the analysis, findings were organized into two broad result areas. The first result area focuses on challenges and priorities within Kenya's water food system, structured around four priority thematic areas: (i) water availability and access, (ii) water and climate resilience in food supply chains, (iii) sustainable water land use for ecosystem resilience, and (iv) water food governance and financing. The second result area examines partnerships and stakeholder engagement. Following the draft report, a validation meeting was convened in April 2026, bringing together stakeholders including

[9] Van Berkum, S., Dengerink, J., Ruben, R., 2018. The Food Systems Approach: Sustainable Solutions for a Sufficient Supply. Wageningen Economic Research, Wageningen. https://doi.org/10.18174/451505

the Dutch Embassy in Nairobi, NGOs, private sector actors, research institutions, and multi stakeholder platforms, and its feedback informed the final report.

2 Challenges and Priorities in the Water-Food System Nexus in Kenya

This section outlines key challenges and priorities in Kenya's water–food system across four domains: water availability and access, climate resilience in food supply chains, sustainable water–land use, and water–food governance and financing.

2.1 Water availability and access

The interdependence between water resources and food production systems in Kenya is particularly direct and structural. Agriculture remains central to livelihoods and food supply, yet it is overwhelmingly dependent on climate-sensitive water sources. The patterns of water scarcity, variability, unequal distribution, and low water-use efficiency collectively shape agricultural productivity, regional inequality, and household food outcomes in profound ways (FAO, n. d[10].; Mulwa, Li, & Fangninou, 2021)[11].

Water availability is a key constraint on food production in Kenya, where most agriculture is rain-fed and highly vulnerable to seasonal and interannual rainfall variability. In arid and semi-arid lands (ASALs), drought is not an exceptional event but a recurring condition. Since many households depend directly on agriculture or pastoralism for both income and subsistence, reduced water availability quickly translates into reduced food availability and purchasing power. At the national level, diminished agricultural output increases reliance on food imports and humanitarian assistance, while also contributing to rising food prices. Similarly, projected water balances by catchment area illustrate the structural pressure on water resources (Table 1). While total national water demand represented about 14% of available resources in 2010, projections indicate that demand could reach roughly 81% of available resources by 2030 and remain at similar levels by 2050. Certain basins including Athi, Tana, and Ewaso Nyiro North are already at or exceeding sustainable limits. These imbalances signal intensifying competition among agricultural, domestic, industrial, and ecological uses. As water stress increases at basin level, agricultural withdrawals become more constrained, directly affecting irrigation expansion and food production capacity.

Table 1: Available water resources and water demand by catchment area

Catchment Area[12]	2010			2030			2050		
	Water Resources (a)	Water Demand (b)	(b)/(a)	Water Resources (c)	Water Demand (d)	(d)/(c)	Water Resource (e)	Water Demand (f)	(f)/(e)
LVNCA	4,742	228	5%	5,077	1,337	26%	5,595	1,573	28%
LVSCA	4,976	385	8%	5,937	2,953	50%	7,195	3,251	45%
RVCA	2,559	357	14%	3,147	1,494	47%	3,903	1,689	43%
ACA	1,503	1,145	76%	1,634	4,586	281%	2,043	5,202	255%
TCA	6,533	891	14%	7,828	8,241	105%	7,891	8,476	107%
ENNCA	2,251	212	9%	3,011	2,857	95%	1,810	2,950	163%
Total	**22,564**	**3,218**	**14%**	**26,634**	**21,468**	**81%**	**28,437**	**23,141**	**81%**

Source: Republic of Kenya. (2014). National Water Master Plan 2030

Availability alone does not fully explain food outcomes; access to water is equally critical. In most landscapes or catchments, upstream–downstream dynamics complicate water availability and access, creating spatial inequalities that directly affect food production (Figure 2). In basins such as Tana, Athi, and Ewaso Nyiro, withdrawals for urban supply, commercial agriculture, and hydropower upstream reduce dry-season flows reaching smallholder communities downstream. In the Ewaso

[10] Food and Agriculture Organization of the United Nations. (n.d.). *Kenya country activities | WaPOR, remote sensing for water productivity*. https://www.fao.org/in-action/remote-sensing-for-water-productivity/country-activities/kenya/en

[11] Mulwa, F., Li, Z., & Fangninou, F. F. (2021). Water scarcity in Kenya: Current status, challenges, and future solutions. *Open Access Library Journal*, 8, 1–15. https://www.scirp.org/journal/paperinformation?paperid=106638

[12] Catchment Acronyms: LVNCA – Lake Victoria North Catchment Area; LVSCA – Lake Victoria South Catchment Area; RVCA – Rift Valley Catchment Area; ACA – Athi Catchment Area; TCA - Tana Catchment Area; ENNCA – Ewaso Nyiro North Catchment Area

Nyiro North basin, upstream horticultural farms reduce flows to arid pastoral areas, intensifying seasonal water shortages. These dynamics manifest in reduced irrigation reliability, shrinking cultivated areas, livestock losses, and periodic water conflicts (Republic of Kenya[13]). Strengthened basin level coordination and equitable allocation are therefore essential for stabilizing water access and food security.

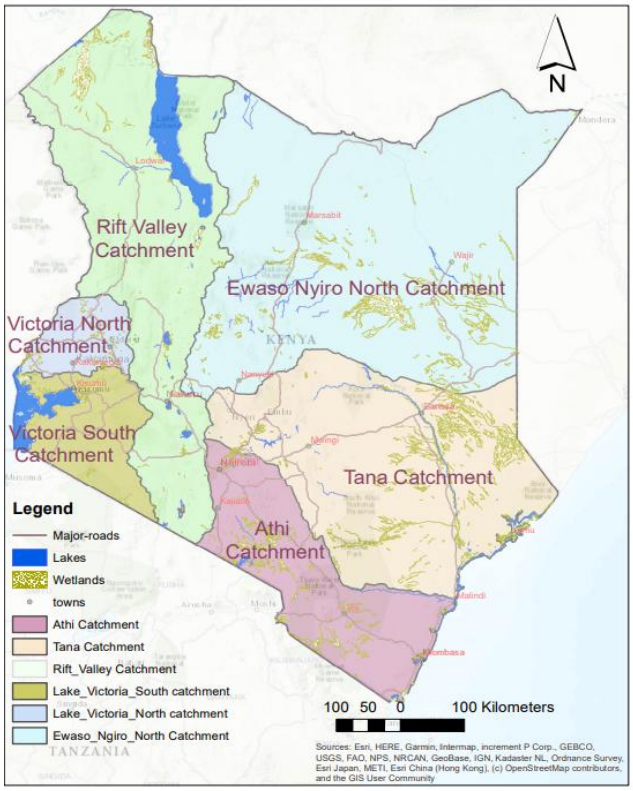

Figure 2: Kenya drainage basins showing the major river catchment areas including the Lake Victoria, Rift Valley, Athi, Tana, and Ewaso Ng'iro basins.

Gender dynamics amplify water access inequalities and food insecurity. In rural areas, women and girls, who shoulder the bulk of water collection, experience "time poverty," which limits their capacity for farming, income generating activities, and childcare. Only 56% of rural households have access to basic drinking water compared with 91% in urban areas, and 54% lack water on their premises, necessitating repeated trips (KNBS & ICF, 2023)[14]. This recurring burden reduces labor available for cultivation, household nutrition management, and childcare, while also impacting health. Limited water access restricts women's ability to irrigate kitchen gardens, prepare diverse meals, or participate in horticulture, thereby undermining both agricultural productivity and household food security. Consequently, water access constraints reinforce gendered disparities, as women and girls remain primarily responsible for both water collection and agricultural work in rural communities.

Water quality in Kenya is closely linked to agricultural practices and broader governance of water resource management. Although about 80% of households have access to improved water sources, water quality remains uneven due to pollution of surface and groundwater, particularly in urban and intensively farmed areas. A major concern is agricultural chemical use, where pesticide residues above safe limits have been detected in crops such as kales and tomatoes. This is driven by high reliance on Highly Hazardous Pesticides (HHPs), which account for about 76% of total pesticide use, while biopesticides remain low at around 2% (Figure 3). Inefficient irrigation and agricultural

[13] Republic of Kenya, Ministry of Water, Sanitation and Irrigation. (2021). *National Water Resources Strategy (2020–2025)*. Government of Kenya. https://www.water.go.ke/sites/default/files/publications/THE%20NATIONAL%20WATER%20RESOURCES%20STRATEGY%20%281%29%282%29.pdf

[14] Kenya National Bureau of Statistics (KNBS) & ICF. (2023). *Kenya Demographic and Health Survey (KDHS) 2022: Summary Report*. https://www.knbs.or.ke/reports/kdhs-2022/

runoff further exacerbate contamination pathways into surface and groundwater systems. However, national pesticide data remain limited, and monitoring and surveillance systems are irregular and weak, constraining effective regulation and enforcement.

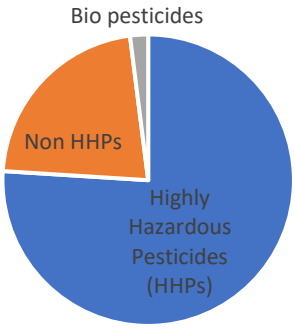

Figure 3: Share of HHPs use in Kenya. Source: Heinrich Böll Foundation (2023)

Water quality governance faces similar challenges, including pollution from domestic effluent, industrial discharge, and unsustainable land use practices. Monitoring systems are inconsistent, with limited community participation and inadequate investment in wastewater treatment, recycling, and reuse technologies[15]. Thus, the interaction between intensive agricultural chemical use and weak water quality governance highlights a critical gap at the agriculture–water interface, calling for stronger integrated monitoring, enforcement, and pollution control systems

Overall, Kenya faces significant water and food security challenges, including variable rainfall, limited irrigation, and pressures on water and land resources. The linkages are therefore causal and systemic with fluctuations in water availability directly affecting agricultural output, which in turn shapes food security at household, regional, and national scales. Strengthening water–food system resilience requires expanding climate-resilient water storage, promoting rainwater harvesting, and scaling efficient, climate-smart irrigation. Integrating Water, Sanitation and Hygiene (WASH) with agriculture and nutrition, enhancing water quality management, supporting women- and youth-led water and agribusiness initiatives, and leveraging digital tools for planning and monitoring can collectively boost productivity, inclusivity, and resilience across water-food systems.

2.2 Water and climate resilience in food supply chains

Food supply chains rely on consistent water availability and quality, and disruptions compromise food production and incomes. Climate shocks, including droughts and floods, amplify these risks by affecting irrigation, processing, and transport. A number of issues underpin this nexus:

Water security directly influences food production in a context where 98% of agriculture is rain-fed and highly vulnerable to climatic shocks (Ministry of Water and Sanitation, 2022).[16] Irrigation, which could enhance productivity and resilience, covers only about 1.7% of agricultural land and less than 5% of its potential (Republic of Kenya, 2025[17]). Kenya's total irrigation potential exceeds 1.3 million hectares, yet only around 13% had been developed by 2015, with key basins like Lake Victoria and Ewaso Nyiro North realizing less than 10% (Table 2). About 60% of this potential relies on water harvesting and storage, highlighting the need for investment in dams, water pans, and small-scale systems. Expansion remains slow (about 5,000 hectares per year) due to undercapitalization, weak coordination and inadequate infrastructure. Meanwhile, erratic rainfall, prolonged droughts, and severe floods further strain water availability, disrupt production cycles, limit

[15] Ministry of Water, Sanitation and Irrigation. (2021). *The national water policy, 2021*. Government of Kenya. https://water.go.ke/sites/default/files/2025-01/The%20National%20Water%20Policy%2C%202021.pdf

[16] Ministry of Water and Sanitation. (2022). National Irrigation Services Strategy (NISS) 2022–2030 [Final draft]. https://www.water.go.ke/sites/default/files/publications/30-8-2022%20NISS%20FINAL%20DRAFT%20-%20SIGNED.pdf

[17] Republic of Kenya, Ministry of Water, Sanitation and Irrigation. (2025). National Irrigation Services Strategy 2022–2026 (Draft) [Government strategy document]. Government of Kenya. https://www.water.go.ke/sites/default/files/publications/30-8-2022%20NISS%20FINAL%20DRAFT%20-%20SIGNED.pdf

year-round cultivation, and contribute to post-harvest losses. With agriculture accounting for up to 80% of freshwater withdrawals, improving water use efficiency and expanding sustainable irrigation are critical to strengthening food system resilience (FAO, n.d.[18]; World Bank, 2025[19]).

Table 2: Estimated and developed irrigation potential by major water basin in Kenya (2015)

Water Basin Area	Estimated Irrigation Potential (ha)	Developed as of 2015 (ha)	% Developed
Lake Victoria	292,858	23,939	8%
Rift Valley	73,080	18,822	25%
Athi River	278,526	51,443	18%
Tana River	546,875	74,160	13%
Ewaso Nyiro North	150,561	12,141	8%
Total	1,341,900	180,505	13%

Source: Republic of Kenya (2014), National Water Master Plan 2030

Low water-use efficiency intensifies challenges in agricultural production. Inefficient irrigation methods, leakages in conveyance systems, poor maintenance, and limited farmer knowledge on efficient water management reduce the proportion of water abstracted for production that actually reaches crops. When water productivity is low (meaning, crops produce little per unit of water consumed), agriculture still requires greater withdrawals to maintain output, increasing pressure on already stressed catchments. Food insecurity, therefore, arises not only from limited water availability but also from inefficient use and management of water intended for production. Dutch expertise could help address these challenges by providing water-smart agricultural technologies such as drip irrigation, solar pumps, and practices that enhance soil-water synergy. This support can be combined with farmer training and data-driven decision-support tools to optimize water use.

Climate variability and shocks significantly amplify food system fragility in Kenya. Climate change intensifies droughts and floods, reduces soil moisture, and disrupts agricultural calendars, undermining yields and destabilizing incomes (Republic of Kenya, 2017[20]). Limited water harvesting, storage infrastructure, and low adoption of affordable irrigation reduce smallholders' ability to manage these risks, while inefficient irrigation leads to water losses through seepage and evaporation. Over the past decade, Kenya has experienced severe droughts in 2010–2011, 2016–2017, and 2020–2022, causing widespread livelihood losses, population displacement, and food insecurity (ACAPS, 2022[21]). These impacts affect not only food supply but also food quality, access and utilization, highlighting the urgent need for integrated climate resilient water-food strategies. Dutch expertise in precision agriculture, digital weather services, and climate-adaptive technologies offers significant opportunities to enhance local capacities, inform decision-making, and reduce vulnerability to climate extremes.

Irrigated seed systems are critical for seasonal production and overall food system resilience. Locally adapted food and crop varieties play a critical role in strengthening climate resilience. These varieties, developed and preserved through Farmer Managed Seed Systems (FMSS) and indigenous practices, are inherently suited to local agro-ecological conditions. They often demonstrate higher tolerance to drought, pests, and climate variability, making them essential for buffering smallholder farmers against climate shocks and seasonal uncertainties. However, despite their importance, the systems that support the preservation, multiplication, and exchange of these locally adapted varieties remain weak. This is largely due to limited policy recognition, inadequate institutional support, and a lack of incentives for community-based seed production and distribution. As a result, smallholders frequently face seed shortages—particularly during low-rainfall seasons—because seed production is

[18] Food and Agriculture Organization of the United Nations. (n.d.). Kenya country activities | WaPOR, remote sensing for water productivity. FAO. https://www.fao.org/in-action/remote-sensing-for-water-productivity/country-activities/kenya/

[19] World Bank. (2025). Freshwater withdrawals from agriculture (% of total) — Kenya. Helgi Library (World Bank data). https://www.helgilibrary.com/indicators/freshwater-withdrawals-from-agriculture-as-of-total/kenya/

[20] Government of Kenya, Ministry of Agriculture. (2017). *Kenya Climate Smart Agriculture Strategy 2017–2026*. https://kilimo.go.ke/wp-content/uploads/2025/09/Kenya-Climate-Smart-Agriculture-Strategy-2017-2026.pdf

[21] ACAPS. (2022,). *Impact of drought: Turkana and Marsabit counties – thematic report*. https://www.acaps.org/sites/acaps/files/products/files/20221207_acaps_thematic_report_horn_of_africa_impact_of_drought_in_kenya_0.pdf

still heavily dependent on rain-fed systems. Strengthening localized seed systems through cooperative-led irrigated seed multiplication hubs offers a viable solution. These hubs can ensure reliable, year-round production of both locally adapted and certified climate-resilient varieties, improving timely access to quality seeds. In addition, they can serve as platforms for delivering complementary services such as soil testing, water management, and agronomic support. Experiences from programs supported by organizations such as SNV and Agriterra demonstrate the potential of such models to enhance seed system resilience, strengthen farmer cooperatives, and improve distribution networks.

Alternative and locally adapted livelihood options can reduce pressure on fragile ecosystems and strengthen resilience across the water-food nexus. Across the landscapes, the combined effects of charcoal production, overgrazing, and input-intensive agricultural and food production practices have accelerated deforestation, soil erosion, pollution, and water source degradation, reinforcing a cycle of ecosystem decline and poverty. Diversified livelihoods such as beekeeping, water smart agroforestry, drought tolerant horticulture, sustainable fodder production, dairy intensification with controlled grazing, and strengthened food value chains can improve incomes while reducing environmental pressure. These alternatives can align economic incentives with watershed and soil restoration, when coupled with improved market access, finance, extension services, and participatory governance.

2.3 Sustainable water-land use for ecosystem resilience

Kenyan landscapes—including forests, wetlands, rangelands, croplands, and coastal ecosystems—underpin ecosystem services essential to water and food systems. These ecosystems regulate water, maintain soil fertility, sequester carbon, and support biodiversity, all critical for agricultural productivity and community livelihoods (Ellison et al., 2017)[22]. However, rapid population growth and expanding land demand are intensifying pressure on these systems, driving degradation, reducing water regulation, and lowering productivity (Wanjiru, 2017[23]; Mulinge et al., 2016[24]). Grazing within forest areas, unclear boundaries, and competing land uses weaken restoration gains, while upstream degradation increases downstream water scarcity, treatment costs, and agricultural losses. Forest restoration also affects hydrology, as trees consume water, especially during early growth stages, highlighting the need for balanced planning. Unregulated water abstractions and tree species choices further influence restoration success, since species selection affects survival, water use efficiency, and the development of forest microclimates that support rainfall retention and overall ecosystem functioning (Figure 3). These dynamics underscore the need for integrated and context-sensitive landscape management.

[22] Ellison, D.; Morris, C.E.; Locatelli, B.; Sheil, D.; Cohen, J.; Murdiyarso, D.; Gutierrez, V.; van Noordwijk, M; Creed, I.; Pokorny, J.; et al. Trees, forests and water: Cool insights for a hot world. Global Environ. Chang. 2017, 43, 51–61.

[23] Wanjiru, P. 2017. New private sector-led effort to replant Mau Forest. http://www.kenyafreepress.com/MENR (2016) Technical Report on the National Assessment of FLR Opportunities in Kenya.

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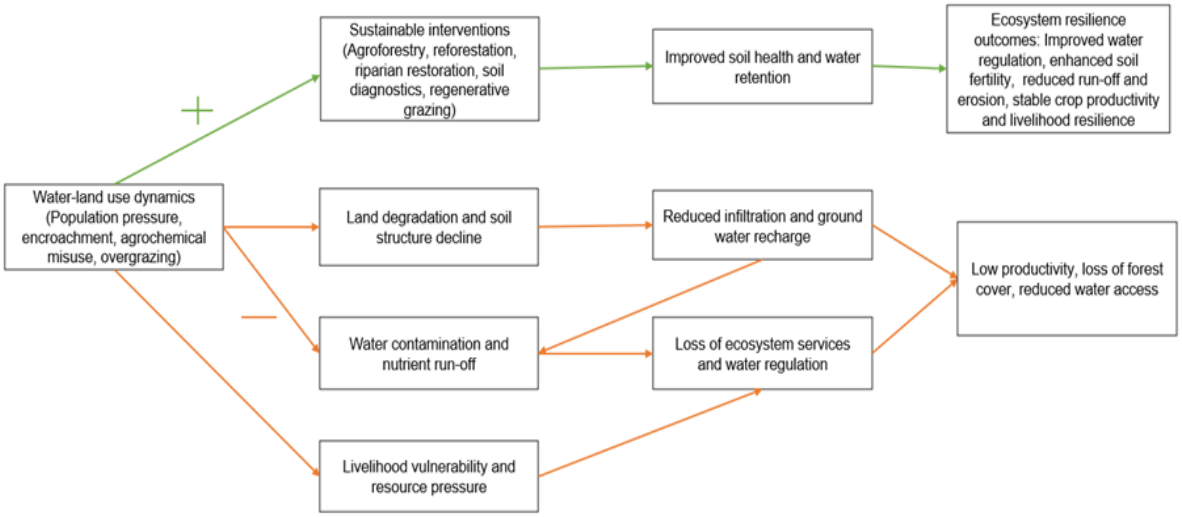

Figure 3: Impact pathways of water–land use on ecosystem resilience (Authors, 2026)

Food production systems largely determine how water is extracted, used, and ultimately returned to the ecosystem. Agriculture consumes roughly 80% of available freshwater water, mainly for production and processing (World Bank, 2025[25]). However, water contamination from chemicals such as heavy metals, pathogens, and sediments can reduce crop yields, compromise food safety, and threaten farmer incomes (Vörösmarty et al., 2010[26]). Farmers interviewed during field visits reported crop damage linked to borehole water suspected to contain elevated fluoride levels, indicating how groundwater quality directly affects yields and farmer incomes. Overuse and misapplication of synthetic fertilizers and agrochemicals further increase nutrient runoff, causing pollution and eutrophication. Uptake of biological inputs, microbial enhancers, micro-fertilizers, and soil health practices remains low due to limited awareness, fragmented delivery systems, and weak extension support. Many farmers lack knowledge of soil and water testing, and affordability is a barrier, particularly for smallholders. Without site-specific diagnostics, fertilizer and irrigation decisions are generalized, undermining productivity and sustainability. Dutch organizations such as SNV, Acacia Water, and Koppert provide expertise in integrated soil–water–agriculture solutions and climate-smart interventions, offering opportunities to strengthen diagnostics, optimize input use, and improve both productivity and ecosystem sustainability.

2.4 Water–food system governance and financing in Kenya

This section assesses governance and institutional coordination across institutions, regulations, markets, financing, and ecosystem management, and their influence on water-food system nexus.

Governance and institutional coordination: Despite comprehensive policies including the National Water Policy (2021), Water Act (2016), National Water Resources Strategy (2020–2025), National Irrigation Services Strategy (2022–2026), ASTGS (2019–2029), National Agroecology Strategy (2024–2033), integration of water, food, and climate objectives is weak. Fragmented mandates and siloed policies mean national institutions for water, environment, and agriculture often operate in parallel, while counties are poorly integrated into basin-level planning. This disconnect leaves irrigation, livestock, and catchment management misaligned with water availability and agricultural strategies. Stakeholders often have low water–food linkages, poor coordination, and limited knowledge on these issues. Key gaps include weak coordination, misaligned planning, siloed data, inefficient water allocation, regulatory bottlenecks, and limited use of digital tools (Box 1).

Box 1: Gaps and tradeoffs in water-food policy coordination and governance in Kenya

[25] World Bank. (2025). Freshwater withdrawals from agriculture (% of total) — Kenya. Helgi Library (World Bank data). https://www.helgilibrary.com/indicators/freshwater-withdrawals-from-agriculture-as-of-total/kenya/

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- **Climate planning:** The Climate Change Act (2016) mandates climate mainstreaming, but many counties lack units and enforcement, leaving local planning unprepared for climate risks.
- **Water allocation:** National policies and basin boards are not binding locally, allowing unsustainable water use.
- **Water tariffs vs. productive use**: Pricing frameworks inadequately support irrigation and rural water services
- **Agriculture–water alignment:** Irrigation policies are not legally linked to water plans, enabling intensification without considering local water availability.
- **Environmental oversight:** Impact assessments rarely evaluate trade-offs between water, food, and climate, risking ecosystems and water security.
- **County development planning:** County plans are fragmented and poorly aligned with national strategies, limiting coordinated action.
- **Data governance:** Water, agriculture, and climate data remain siloed, restricting evidence-based and cross-sector decision-making.

Multistakeholder platforms and coordination: The MSP landscape in Kenya's agri-food systems has expanded in recent years, driven by global initiatives, sectoral priorities, and the need to address emerging challenges. bring together government, civil society, the private sector, researchers, farmers' organizations, and development partners to address shared challenges such as agrobiodiversity, climate resilience, land tenure, and nutrition. Although they often lack statutory authority, they foster trust, shared understanding, and innovation pathways that can inform formal decision-making. Mandates and structures vary widely, reflecting the complexity of food systems governance. KII data indicates that while most MSPs are effective in convening stakeholders and facilitating policy dialogue, they are weaker in knowledge management, adaptive learning, and resource mobilization, limiting translation of dialogue into sustained action. The proliferation of MSPs has created coordination challenges, with many operating in parallel and overlapping in mandates, roles, responsibilities, and geographic scope. In some cases, donor-driven initiatives have established new platforms rather than strengthening existing ones, contributing to fragmentation, duplication, and inefficiencies. In this assessment, we identified ten (10) active MSPs across sectors such as agriculture, health and nutrition, land, and environment including the Climate Smart Agriculture Multi-Stakeholder Platform (CSA-MSP); Inter-sectoral Forum for Agrobiodiversity and Agroecology (ISFAA); Scaling Up Nutrition (SUN) Movement—Kenya Chapter; the National Food Systems Steering Committee (NFSSC); Kenya National Land Coalition (KNLC); Ardhi Caucus; Community Land Association of Kenya (CLAN!); Pastoralist Alliance for Resilience and Adaptations Across Nations (PARAAN); Food and Land Use Coalition (FOLU) Kenya ; and Murang'a Agroecology MSP.

Institutionally, MSPs occupy a hybrid space between informal collaboration and formal governance. Power is often concentrated among dominant actors, with weak accountability and uneven inclusion of women, youth, and marginalized groups. While many platforms operate at national level, some extend to county and landscape scales to support implementation. Although National and regional platforms exist, respondents noted that collaboration across levels remains limited. In Kenya's devolved context, this is reflected in formal coordination structures such as the Joint Agriculture Sector Steering Committee (JASSCOM) at national level and County Agriculture Sector Steering Committees (CASSCOMs) at county level. These platforms provide institutional spaces for aligning policies, budgets, and sector performance across levels of government and actors. At the community level, local associations such as water user groups and community forest associations are often dominated by influential actors. Despite these challenges, MSPs have influenced policies, reforms, monitoring systems, trust-building, and collaborative action, linking local priorities to national and global governance and enhancing resilience.

Regulatory, fiscal, and operational constraints: Water tariffs, weak compliance monitoring, and rigid regulations drive high water losses and limit agricultural productivity, while water authorities often lack the capacity to address these gaps. In ASALs and emerging growth corridors, weak fiscal incentives, such as limited subsidies for irrigation, high duties on solar pumps and panels, and inadequate support for climate smart technologies, raise capital costs and discourage investments in climate resilient water infrastructure. Aging infrastructure, leakages, illegal abstraction and underutilized digital monitoring reduce water availability and reliability, with non-revenue water private investment in irrigation and bulk water supply. Dutch-supported initiatives, including the Blue Deal in the Upper Tana region and SNV programs in the South West Mau landscape have demonstrated the value of strengthened governance, basin planning, and climate resilient water use in boosting

smallholder productivity and resilience. Strengthening metering, leak detection, performance-based management, accountability frameworks, and implementing regulatory and fiscal reforms remain critical to improve water efficiency, service reliability, and climate resilient agricultural development.

Market and supply chain financing: Weak market aggregation and fragmented supply chains prevent smallholders from converting water-food investments into higher incomes and resilience. High certification costs and limited storage or cold chain infrastructure restrict access to premium domestic and export markets, so gains from improved irrigation and productivity often fail to fund soil and water conservation. Strengthening cooperatives and linking them with savings and credit organizations can pool irrigation finance, support conservation levies, and reduce transaction costs, but regulatory and financial systems remain limiting. Dutch-supported financing partnerships, working through financial institutions and out grower models that connect large-scale producers with smallholders, can provide concessional loans, assured markets, inputs, and technical support while promoting water stewardship. Investments in aggregation infrastructure, cooperative governance, digital platforms, and certification support can better align water-food investments with income growth, resilience, and sustainable resource use.

Financing gaps and the missing middle: Most viable irrigation, solar pumping, and agri-processing enterprises require investments of €50,000–€150,000, yet available financing is largely structured for projects above €2 million, leaving smallholders, cooperatives, and SMEs underserved. Weak de-risking instruments, fragmented blended finance, and high perceived risks limit investment in smallholder irrigation and rural water supply, while ecosystem services such as catchment restoration remain largely unmonetized, leaving community associations without predictable revenue. Strengthening accessible finance, institutionalizing first loss guarantees, monetizing ecosystem services, and supporting technical and financial capacity will enable irrigation expansion, ecosystem restoration, and productive water use to scale. Coupled with improved market aggregation, value chain linkages, and access to domestic and export markets, these measures can align water-food investments with income growth, resilience, and sustainable resource use

Ecosystem services and payments for conservation: Payments for ecosystem services in Kenya remain limited, fragmented, and largely supported by development partners (e.g. Global Environment Facility (GEF), providing unpredictable incentives for sustained catchment conservation. Evidence from the Tana River and Mau Landscapes shows that sedimentation and reduced aquifer recharge increase water treatment costs and reduce agricultural productivity. Basin-level investments linking upstream conservation actors with downstream commercial users, county governments, and private financiers are still underdeveloped. Initiatives such as the Nairobi Water Fund demonstrate a more structured model, where organizations collaborate on basin restoration. However, planning often prioritizes hard infrastructure over natural capital, limiting the scaling of ecosystem financing. Strengthening payment for ecosystem service models, embedding them in county development plans, expanding credit schemes, and formalizing upstream-downstream contracts could better integrate ecosystem conservation within the water-food system.

Local governance in the water food system nexus: Local governance in Kenya's water food system remains fragmented, particularly between Water Resources Users Associations (WRUAs) and Community Forest Associations (CFAs), which operate in shared catchments but with weak coordination. WRUAs focus on water management while CFAs handle forest conservation, yet their planning frameworks are developed separately and lack a shared evidence base linking forests, water, and land use. This is compounded by parallel data systems, limited inclusion of farmer groups and cooperatives, and an unclear role for the private sector. Institutional constraints such as limited capacity and weak coordination mechanisms further reduce effectiveness, leading to duplication of mandates and missed synergies. Strengthening the nexus requires integrated planning, joint monitoring, and more inclusive governance that aligns forest, water, and agricultural outcomes.

3 Stakeholder and Partnerships in the Water-Food Landscape in Kenya

3.1 Stakeholders in the water-food system in Kenya

Kenya's water–food nexus involves a diverse network of stakeholders, including national and county government agencies, private sector actors, international and local Non-Governmental Organizations (NGOs), civil society organizations, research institutions, multistakeholder platforms, cooperatives, and community-based organizations. Each plays a distinct role, from policy-setting, regulation, and financing to technical support, market development, community mobilization, and data generation,

collectively contributing to sustainable water -food system outcomes (see Annex 2 for a detailed stakeholder matrix).

Despite a relatively well-connected stakeholder network in Kenya's water-food nexus, several challenges continue to limit effective coordination and sustainable resource management. Governance remains fragmented across water, forestry, agriculture, and climate sectors, while long-term financing is limited and climate, soil, and water services are weakly integrated. Engagement between businesses and local communities is often insufficient, reducing opportunities for collaborative planning and investment. These gaps constrain the ability of actors to align incentives, coordinate interventions, and scale landscape-level solutions. Strengthening structured partnership models, improving landscape-level coordination, and fostering cross-sector collaboration are therefore essential to bridge institutional silos, enhance complementarities, and increase collective impact. Table 3 summarizes key stakeholder challenges and their impacts on the water–food nexus.

Table 3: Key stakeholder challenges and implications for the water–food nexus

Challenge	Challenges across the stakeholders	Implications for the Water–Food Nexus
Fragmented governance and institutional silos	○ Overlapping mandates between national agencies and county governments create unclear roles and duplication of efforts. ○ Weak vertical coordination between national and county levels. ○ Sectoral silos across water, forestry, agriculture, energy, and climate institutions. ○ Parallel project implementation by NGOs and development partners outside government systems.	○ Delayed decision-making and inefficient resource allocation. ○ Policy inconsistencies in water allocation, land-use planning, and restoration priorities. ○ Reduced effectiveness of integrated watershed and landscape management.
Weak coordination and power imbalances	○ Grassroots actors (WRUAs, CFAs, CBOs) exhibit low connectivity within broader governance networks. ○ Limited direct engagement between private sector actors and upstream communities. ○ Power imbalances within multistakeholder platforms. ○ Weak data–policy–practice linkages.	○ Marginalization of local knowledge and reduced community ownership. ○ Risk of elite capture and inequitable benefit distribution. ○ Weak coordination between market incentives and conservation goals. ○ Reduced trust and collaboration across stakeholder groups.
Capacity and financing constraints	○ Local governments, WRUAs, and CBOs face financial and technical limitations (e.g., GIS, water monitoring, climate advisory interpretation). ○ Project-based donor financing limits long-term sustainability. ○ Private sector perceives restoration investments as high risk. ○ Limited integration of climate and soil advisory services.	○ Reduced ability of local actors to engage meaningfully in nexus governance. ○ Incomplete implementation of restoration and irrigation infrastructure. ○ Underinvestment in long-term landscape resilience. ○ Exacerbation of existing inequalities in resource governance.

3.2 Partnership models in the water–food nexus

Three main partnership models were observed; the Integrated Landscape Restoration Model (ILRM), Public–Private Partnerships (PPPs), and Multistakeholder Platforms (MSPs).

The Integrated Landscape Restoration Model (ILRM) adopts a systems perspective, recognizing the interlinkages between land, water, and food systems. It balances productivity with ecological conservation through practices such as agroforestry, riparian buffers, terracing, and climate-smart agriculture. This approach is demonstrated in the South West Mau landscape and the Initiative for Sustainable Landscapes (ISLA), led by IDH Kenya in partnership with the Kenya Tea

Development Agency, SNV, Kenya Forest Service, and other actors. Financing mechanisms under ILRM include blended finance (IDH Kenya contributes up to 50% of project costs), outcome-based financing (structured contributions from downstream water users), and Payment for Ecosystem Services (PES), which provide alternative revenue streams for sustainable land and water management (OECD, 2018)[27]. These mechanisms help de-risk restoration investments and incentivize upstream conservation. Despite these tools, fragmented governance, regulatory uncertainty, high transaction costs, short-term policy focus, and limited credit access for smallholders continue to constrain scaling of water-food nexus initiatives (Table 4).

Table 4: Examples of Integrated Landscape Restoration Models in Kenya

Partnerships	Focus areas	Gaps
Kenya Water Partnership (KWP)	IWRM coordination; water policy dialogue; wetland and catchment conservation; alignment to SDG 6; stakeholder convening across national and county levels	The partnership is strong on water governance and ecosystems, but lacks mechanisms for translating water gains into food availability, dietary diversity, or food safety outcomes
Upper Tana–Nairobi Water Fund (UTNWF)	Landscape restoration; erosion and sediment control; water security; smallholder land management and tree planting	Food and nutrition outcomes are largely measured in economic terms, with limited consideration of broader food system performance, systems thinking, and governance dimensions
Blue Deal Programme	Basin-level water governance; water quality improvement; riparian restoration; pollution control; institutional strengthening of utilities and regulators	The focus on improving water quality is not explicitly linked to food safety, fresh produce quality, nutrition-related health outcomes, or associated governance mechanisms.

Table 4 reveals that while integrated landscape initiatives in Kenya demonstrate strong performance in specific domains, particularly water governance, ecosystem restoration, and institutional coordination, they exhibit limited integration with broader food system outcomes. Across the initiatives, there is a consistent emphasis on water resource management, catchment protection, and environmental sustainability, with comparatively less attention given to food security, nutrition, and food safety dimensions. This suggests that, in practice, the water–food nexus remains weakly operationalized, with interventions often addressing sectors in isolation rather than as interconnected systems. Furthermore, the gaps identified point to a broader governance challenge; a disconnect between environmental restoration governance and measurable food system outcomes, driven by weak cross-sector integration, fragmented indicators, and limited outcome-oriented coordination. While existing platforms and partnerships generate environmental gains, these are not systematically translated into improvements in food security, productivity, or livelihoods. This highlights the need for more deliberate integration of food system indicators, strengthened cross-sector coordination frameworks, and governance arrangements that better link water, land, and food outcomes within landscape restoration approaches. This points to the need for more deliberate integration of food system indicators, cross-sector coordination frameworks, and governance arrangements that link water, land, and food outcomes more coherently within landscape restoration models.

Public–Private Partnerships (PPPs) operate through structured collaboration between larger institutions and community-based organizations. Twinning arrangements link grassroots actors with national or international partners, enabling access to finance and technical expertise while preserving local legitimacy (SUN-CSA Kenya, 2023[28]). For example, soil amendment initiatives promoted by IDH Kenya and World Resources Institute were implemented locally by Slow Food Kenya and Seed Savers Network. Additionally, IDH Kenya leads the Farm feed Program to grow SMEs and promote local horticultural production through Syngenta (inputs), AgriCo, Yara (Kirinyaga – tomato), Growpact (Kitale), and Goshen Limited. PPPs rely on pooled funding[29] and bundled delivery models that combine inputs, training, market access, climate advisory services, and finance. This

[27] OECD (2018). Making Blended Finance Work for the Sustainable Development Goals. Paris: OECD Publishing. 10.1787/9789264288768-en

[28] SUN-CSA Kenya (2023). *Annual Report: Strengthening Nutrition Governance through Multi-Stakeholder Platforms*.
Includes examples of twinning between national and county-level CSOs.https://sun-csa.org

[29] FAO & GIZ (2020). *Multi-Stakeholder Partnerships for Sustainable Food Systems: A Guide to Effective Collaboration*.
This guide outlines how twinning and pooled funding models can enhance MSP effectiveness and inclusivity.
https://www.fao.org/documents/card/en/c/cb2884en

integrated delivery reduces transaction costs and improves affordability for smallholder farmers. For instance, Agriterra promotes soil testing services anchored within cooperatives, where cooperatives partner with crop nutrition laboratories and receive a commission for facilitating farmer access to testing services. In addition, WRI has partnered with WFP through its FTMA Farmer Service Centres and village-based extension officers, implemented by CGA, to support last-mile distribution of inputs and services using Integrated Pest Management (IPM) approaches. This partnership strengthens farmer access to technical support, and improves adoption of sustainable practices.

Multistakeholder Platforms (MSPs) provide coordination mechanisms across basin, county, and national levels. At the basin level, initiatives like the Nairobi Water Fund, the Chania River Basin (Njururi Initiative), and the Stawisha Charitable Trust in the South West Mau landscape demonstrate how pooled funding and collective governance can advance watershed restoration, reduce duplication, and promote co-financing among diverse actors. At the county level, structures such as CASSCOM and other county platforms enable coordinated planning, align local stakeholders, support implementation, and advocate for community priorities. At the national level, larger MSPs could help overcome fragmented governance, harmonize policies, influence sectoral decision-making, and address implementation challenges, linking upstream and downstream interests to scale water-food nexus interventions sustainably.

4 Conclusions and Opportunities

4.1 Conclusions

Kenya's water–food nexus presents both critical challenges, tradeoffs and significant opportunities. By integrating policies, strategic investments, and multi-stakeholder collaboration across water, agriculture, finance, and livelihoods, water stewardship can directly strengthen food security and nutrition, production and livelihoods. Dutch expertise in multi-sectoral, climate-adaptive, and partnership-driven approaches aligns with these priorities, supporting locally anchored interventions that enhance productivity, inclusivity, and food system resilience.

Several key synergies can be leveraged to scale impact. First, MSPs provide a critical mechanism for strengthening advocacy, integrated interventions, and enhancing coordination across sectors. Second, the evolving policy environment increasingly supports food system thinking, agroecology, and transformation pathways, enabling integrated planning and implementation. Third, cooperative models deliver blended services, combining microloans, quality inputs, advisory support, and irrigation kits to improve productivity and reduce water stress. Fourth, private sector actors, including Dutch and local agribusinesses, input suppliers, and fintech companies, can enhance value-chain efficiency and expand access to inputs and financing. Fifth, linking universities and research institutions with field projects facilitates co-generation of context-specific climate-smart technologies, and soil–water diagnostics. Finally, Kenya's growing ICT sector enables digital and financial innovations, such as real-time weather forecasting, remote soil monitoring, insurance products, and payments for ecosystem services, optimizing resource use and incentivizing sustainable water-food management.

Kenya's water–food system nexus presents multiple trade-offs that must be carefully managed. Market-oriented value chains, such as dairy, Irish potatoes, or export crops like avocado, can improve incomes and productivity but are often water- and input-intensive, increasing pressure on scarce resources and potentially conflicting with ecosystem restoration. Gender and equity dynamics further complicate outcomes, as better-resourced households and men frequently capture the benefits of commercialization, limiting women's decision-making and access to inputs, which can undermine household food security. Financing water resource management is also challenging: perceptions of water as a public right, limited private-sector incentives, and competing stakeholder interests constrain sustainable and coordinated investments. Achieving systemic resilience therefore requires integrated planning, sustainable intensification, equitable financing mechanisms, and careful species and value-chain selection to balance livelihoods with ecosystem function and long-term water security.

4.2 Opportunities

The scoping assessment identifies opportunities for the Netherlands Food Partnership (NFP) to strengthen Kenya's water–food nexus by building on existing initiatives and addressing systemic gaps in governance, coordination, financing, innovation, and evidence-based systems.

1. Advocacy and awareness on the water–food nexus

Kenya's water–food landscape involves a diverse range of actors working across water management, agriculture, ecosystem conservation, and food systems. However, our assessment shows that these actors often operate in silos, with limited coordination across sectors despite interlinkages between water, land, and food. Advocacy is needed to raise stakeholder awareness of a nexus-based approach. While several MSPs -including the Climate Smart Agriculture MSP (CSA MSP), the Inter-sectoral Forum for Agrobiodiversity and Agroecology (ISFAA), and the Food and Land Use Coalition (FOLU), but the integration of water–food issues within these platforms remains limited, and grassroots institutions such as Water Resources User Associations (WRUAs) and Community Forest Associations (CFAs) are often underrepresented in national dialogues. The NFP can leverage these MSPs to strengthen advocacy and awareness on the water–food nexus approach to food system transformation. The aim is to foster a shared understanding of the interlinkages and feedback loops that shape the nexus, and how these dynamics influence livelihoods, food security, nutrition, water, and productivity from household to community and landscape levels. Priority actions would include;

- Convening cross-sector dialogue platforms bringing together actors working on water, agriculture, and food systems, including county governments, WRUAs, CFAs, and platforms such as the Climate Smart Agriculture MSP, ISFAA, and FOLU;
- Supporting coalitions such as the Ardhi Caucus and FOLU to facilitate policy dialogue on integrated water–food governance;
- Developing knowledge products and case studies that show the benefits of nexus-based approaches.

2. Policy alignment and governance coordination

Kenya has established a strong policy framework for water management, agriculture, and climate resilience. However, implementation remains fragmented due to overlapping mandates, weak coordination between national and county governments, and limited integration between basin-level water management and agricultural planning. The NFP could support policy dialogue among stakeholders to mainstream the nexus thinking into policy and practice, and help translate existing policy commitments into more coordinated action. Potential areas of engagement include;

- Work with knowledge partners to conduct reviews of water-food system policies to identify gaps, contradictions, and barriers to a coordinated nexus approach, and provide recommendations for policy alignment and integration;
- Convene multi-stakeholder dialogues and conduct stocktaking at national and sub-national levels to align planning and implementation with water food nexus principles, promoting integrated water management, production, and ecosystem resilience;
- Work with policy and knowledge partners to support counties to integrate water–food nexus priorities into County Integrated Development Plans (CIDPs);
- Promoting basin-level coordination mechanisms that link water allocation, land-use planning, and agricultural production to ensure integrated water–food management across landscapes.

3. Strengthening local governance in water-food systems

The water food nexus in Kenya reflects the interdependence between water resources, agricultural production, and upstream ecosystem health. While Community Forest Associations (CFAs) and Water Resources Users Associations (WRUAs) play complementary roles in forest and water management, farmer groups and cooperatives are also central to shaping sustainable land and water practices.

However, fragmented institutions and weak coordination continue to limit integrated outcomes. Key actions to strengthen local governance include:

- Strengthening coordination between CFAs and WRUAs operating in the same catchments to enable joint planning and implementation
- Integrating Participatory Forest Management Plans (PFMPs) and Sub Catchment Management Plans (SCMPs) through a shared evidence base for forests, water, and agriculture
- Developing a common data system linking forest condition, water availability, and land use dynamics across WRUAs, CFAs, and farmers
- Enhancing inclusion of farmer groups and cooperatives, and clarifying private sector roles in catchment level planning and implementation
- Aligning overlapping mandates in catchment protection, reforestation, and soil conservation to reduce duplication and improve synergy

4. Strengthening climate-resilient water–food systems

Kenya faces interconnected water and food security challenges driven by variable rainfall, limited irrigation, and rising pressure on land and water resources. Unequal access and fluctuating water availability directly constrain agricultural productivity and food security. In response to these systemic challenges, NFP can work with other partners such SNV, Nairobi Water Fund, Acacia Waters, IDH and the Koppert Foundation to support the scaling of integrated interventions that strengthen resilience across water–food systems. Priority actions could include:

- Scale digital water monitoring and decision support by expanding access to soil moisture, groundwater, and river flow sensors, and integrating climate and hydrological data into platforms for irrigation scheduling, water allocation, and early warning;
- Promote solar powered and efficient irrigation systems, including precision technologies such as drip irrigation, to improve water and energy efficiency and reduce over abstraction;
- Expand water harvesting and climate resilient storage through farm ponds, rooftop systems, micro catchments, water pans, sand dams, and farm level storage;
- Strengthen capacity and digital water governance by building skills of counties, WRUAs, and farmers to use GIS, climate data, and decision support tools for planning and management;
- Integrate WASH with agriculture and nutrition programmes to improve water access, health outcomes, and food system performance;
- Scale water efficient innovations in value chains, including technologies such as solar powered eco pulpers, to reduce water use and improve sustainability.

5. Promoting sustainable high-value agricultural value chains

Kenya’s agricultural sector includes high value chains such as avocado, coffee, potato, and horticulture with strong domestic and export demand, yet many initiatives remain project based and are weakly linked to sustainable markets and water efficient production. This creates an opportunity to better integrate water stewardship, climate smart agriculture, and market driven value chains so that productivity gains translate into sustainable livelihoods while reducing pressure on water resources. Through partnerships with SNV, IDH Kenya, Acacia Water, Agriterra, Holland GreenTech, and Koppert Biological Systems, NFP can strengthen market access, promote water efficient practices, and support inclusive agribusiness development. Priority actions could include:

- Supporting farmer field days and demonstration plots that showcase water efficient practices for high value crops, while promoting climate smart irrigation and water stewardship through farmer service centers and village-based extension systems
- Facilitating partnerships between Dutch agribusiness firms, exporters, and Kenyan cooperatives, including Agriterra and Holland GreenTech, to strengthen value chain development and market linkages
- Supporting the co-development of crop specific water safety protocols with technical partners such as Cropnuts and Holland GreenTech to improve quality, compliance, and sustainability.

- Strengthening aggregation models and cooperative led marketing systems to improve smallholder participation in export-oriented value chains.
- Linking farmer training programmes with private sector buyers to enhance market access and long-term commercial sustainability.

6. Innovative financing models for the water–food nexus

The study highlights critical financing gaps that constrain irrigation expansion, landscape restoration, and climate-resilient food systems, particularly for investments in the €50,000–€150,000 "missing middle," which existing facilities often overlook. Ecosystem restoration remains largely donor-dependent, limiting sustainable revenue for smallholders, cooperatives, and agri-SMEs to access finance for irrigation, solar pumping, storage, and climate-smart production. NFP can catalyze innovative financing by partnering with financial institutions and development organizations to reduce investment risks, unlock capital, and support water–food initiatives. Priority actions include;

- Facilitating out grower models and value chain partnerships to strengthen linkages between farmers, cooperatives, SMEs, and markets;
- Providing practical, small-ticket financing, concessional loans, and blended finance for irrigation, agri-processing, and production, in collaboration with partners such as implementers and financial institutions;
- Promoting first-loss guarantee mechanisms to de-risk investments and encourage private and smallholder participation;
- Strengthening outcome-based finance and Payments for Ecosystem Services, linking upstream restoration with downstream water users through structures such as the Stawisha Charitable Trust Fund and Nairobi Water Fund initiatives;
- Building technical and financial capacity of farmers, cooperatives, and local institutions, leveraging Dutch-supported partners such as SNV, Acacia Water, Agriterra, and Koppert for inputs, markets, and guidance on water-efficient, climate-smart practices.

7. Scaling the initiatives and integrated landscape approaches

Several initiatives in Kenya already demonstrate the benefits of integrated approaches that link water management, food production, and ecosystem restoration. However, many remain localized pilot projects with limited mechanisms for scaling beyond specific landscapes or value chains. Limited scaling reduces the broader impact. Through partnerships with Dutch and Kenyan institutions, NFP can help expand successful initiatives and strengthen collaboration between public, private, and community actors. Possible areas of support include:

- Supporting the sustainability of integrated landscape restoration initiatives implemented by organizations such as SNV, WRI, IDH Kenya, Seed Savers Network and Slow Food Kenya through the Stawisha Charitable Trust Fund;
- Expanding bundled service models linking irrigation, seeds, and markets through cooperatives being promoted by partners including Agriterra, SNV and Holland GreenTech;
- Facilitating partnerships between Dutch agribusiness firms and Kenyan cooperatives in regards to soil and water testing, and horticultural value chains as seen in the case of Cropnuts, Agriterra, and Koppert Biological Systems;
- Support the development of models that reward farmers for ecosystem services through improved market access.

8. Water and soil management initiatives

Water and soil quality are critical for maintaining productive and safe food systems. However, contamination risks arising from agrochemical use, runoff, and poor waste management can affect both water resources and agricultural soils. While monitoring systems and testing initiatives exist, follow-up mechanisms for contamination alerts and mitigation actions remain limited. In addition, many farmers have limited awareness of risks and the benefits of regular soil and water testing. In collaboration with Cropnuts, Agriterra, Koppert Biological Systems and Acacia Water, priority actions could include:

- Strengthening follow-up mechanisms for contamination alerts and mitigation strategies in agricultural landscapes;
- Supporting farmer education programmes on environmental risks, soil health, and the benefits of regular soil and water testing;
- Promoting integrated soil and water management practices that improve nutrient efficiency and reduce pollution risks;
- Supporting partnerships with research institutions and laboratories to improve access to soil and water testing services;
- Integrating soil and water stewardship practices into existing farmer training platforms and extension programmes.

9. Strengthening data, evidence, and knowledge systems

The assessment finds fragmented data systems across water, agriculture, and climate sectors, with limited coordination and poor access to climate information, soil diagnostics, and digital advisory services at the farm level. These gaps hinder evidence-based planning and reduce adaptive capacity for farmers and policymakers. NFP can support integrated data and knowledge systems by connecting research institutions, government agencies, and innovation platforms to improve planning, investment, and decision-making across the water–food nexus. Potential actions include:

- Supporting integrated digital platforms linking climate and hydrological data with agricultural information being developed and rolled out by research institutes including JKUAT and KALRO
- Promoting remote sensing, soil and water monitoring technologies and agricultural planning tools such as the Kijani landscape monitoring platform developed by Just Diggit and the RAOM data assessment system used by WRI.

Annexes

Annex 1: List of interviewed stakeholders

No	Stakeholder category	Stakeholder name
1	National Governments	● Ministry of Agriculture and Livestock Development ● Ministry of Water, Sanitation and Irrigation (MWSI) ● Water Resources Authority ● Kenya Forest Services (KFS)
2	County Government	● County Executive Committee (CEC), Agriculture, Nakuru ● Land and Environment Office, Nakuru County ● Directorate of Partnerships and Collaborations, Murang'a ● Water Service Providers
3	Research and academia	● Jomo Kenyatta University of Agriculture and Technology (JKUAT ● University of Nairobi (UoN) ● Kenyatta University
4	International Organizations	● World Resources Institute ● Kenya Water Partnership – KWP
5	Embassy	● Embassy of the Kingdom of the Netherlands, Nairobi
6	Partnerships	● Stawisha Mau trust ● Upper Tana–Nairobi Water Fund (UTNWF) ● Blue deal/Waternet
7	Dutch Organizations and Businesses	● 15 organizations affiliated with Netherlands Business Hub Kenya (NLBH) ● Holland Green Tech ● Acacia Water ● SNV ● Kenya Innovative Finance Facility for Water (KIFFWA) ● IDH Kenya ● Solidaridad

		● Agriterra ● Koppert
8	Multistakeholder Partnerships	● Climate Smart Agriculture (CSA) MSP ● Food and Land Use (FOLU) Kenya ● Inter-sectoral Forum for Agrobiodiversity and Agroecology (ISFAA) ● Community Land Action Now (CLAN) ● Scaling Up Nutrition (SUN) Movement Kenya
9	Local implementing partners and groups	● CropNuts ● Starlight Cooperative and SACCO, Nakuru ● Slow Food Kenya ● Seed Savers Network
10	WRUAs	● Over 100 community leaders and households drawing membership from WRUAS, CFAs, farmer cooperatives, and the Ogiek Community Group
11	Cooperative	● Starlight Farmer's Cooperative Society Limited, Molo

Annex 2: Identified stakeholders for water-food nexus

No.	Stakeholder	Role	Stakeholder Interest / Benefit
County government/local authorities			
1	County Governments	Integrate water-food priorities into CIDPs, allocate budgets, coordinate sector departments, and provide extension and infrastructure support.	Improved food security, water access, climate resilience, and fulfillment of devolved mandate
2	Departments (agriculture, livestock, and fisheries)	Capacity building, extension services, livestock value chain support, and research linkages	Improved livestock productivity and sector mandate fulfillment
3	Department of Water, Environment, Natural Resources & Climate Change	Environmental management, infrastructure development, and climate adaptation coordination	Sustainable resource management and policy compliance
4	Water Service Providers	Water supply management, infrastructure maintenance, and service delivery	Revenue sustainability and improved service efficiency
5	WRUAs	Community-level water allocation, conflict resolution, and catchment monitoring	Equitable water access and strengthened local governance
6	CFAs - The Ogiek Community Group	Forest co-management, restoration, and biodiversity conservation	Sustainable forest livelihoods and improved forest cover
National government departments and agencies			
7	Kenya Wildlife Service (KWS)	Human–wildlife conflict mitigation and conservation management	Strengthened conservation outcomes
8	Kenya Forest Service (KFS)	Catchment restoration, reforestation, and forest protection	Improved watershed protection
9	Ministry of Agriculture	National agricultural policy formulation, coordination of food security programs, oversight of extension systems, promotion of climate-smart agriculture, and alignment of crop, livestock, and irrigation strategies	Improved national food security, increased agricultural productivity, strengthened climate resilience, and achievement of agricultural sector targets
9	Kenya Agricultural and Livestock Research Organization (KALRO)	Agricultural research, climate-smart innovation, and soil and water management technologies	Increased productivity and research uptake
10	Water Services Regulatory Board (WASREB)	Regulation of tariffs and oversight of water service providers	Fair pricing and regulatory compliance

11	Kenya Tea Development Agency	Tea value chain management, sustainability standards, and irrigation efficiency support	Stable production, improved quality, and compliance with sustainability standards
12	Water Resources Authority (WRA)	Water allocation, enforcement of water rights, and catchment protection	Sustainable water governance
13	Nairobi Water Fund	Financing watershed restoration and coordination of upstream–downstream actors	Water security and strengthened institutional collaboration
14	Kenya Meteorological Department (KMD)	Weather forecasting and climate advisory services	Improved early warning and informed agricultural decisions
15	Embassy of the Kingdom of the Netherlands	Food security programming, agricultural innovation support and partnership facilitation	Bilateral cooperation and strengthened food and climate outcomes
Local NGOs			
16	GROOTS Kenya (Grassroots Women)	Community mobilization, gender mainstreaming and capacity building	Women empowerment and inclusive development
17	Slow Food Kenya	Agroecology promotion, biodiversity conservation and sustainable food advocacy	Preservation of indigenous food systems
18	Seed Savers Network	Indigenous seed conservation and agroecology training	Seed sovereignty and climate-resilient crop diversity
International NGOs			
19	World Resources Institute (WRI)	Landscape restoration advisory, assessment and data availability for informed decision, climate and water policy support	Scalable restoration models and evidence-based decision-making
20	Solidaridad	Sustainable value chain development, farmer training and certification support	Market access and improved farmer incomes
21	IDH	Sustainable horticulture promotion, blended finance mobilization and landscape partnerships	Responsible sourcing and resilient supply chains
22	World Wide Fund	Ecosystem conservation, watershed protection and biodiversity advocacy	Improved ecosystem health
23	SNV	Capacity building, policy support and climate-smart agriculture promotion	Livelihood improvement and strengthened governance
Business community			
24	Holland Green Tech	Greenhouse systems, irrigation technologies and climate-smart solutions	Increased market access and productivity
25	Agriterra	Cooperative development, agribusiness advisory and farmer organization strengthening	Stronger cooperatives and improved market integration
26	Cropnuts	Soil and water testing, contamination monitoring and crop advisory services	Increased demand for diagnostics and improved productivity
27	Koppert Biological Systems	Biological crop protection and soil health solutions	Expansion of bio-input markets and sustainable farming adoption
28	Acacia Waters	Water stewardship advisory, hydrogeological assessments and basin-level protection and restoration planning	Strengthened water sustainability and corporate stewardship outcomes
Multistakeholder Platforms			
29	Climate Smart Agriculture -MSP	ridges policy, technical support, and multi-actor coordination to scale climate-smart agriculture, improve resilience, and link CSA adoption to food security, water management, and sustainable livelihoods.	Implementation of the Kenya Climate Smart Agriculture Strategy (2017-2026)

30	Food and Land Use (FOLU)	Facilitate multi-stakeholder collaboration to transform food and land use systems through policy support, evidence generation and investment mobilization	Sustainable food systems, improved land use practices, and strengthened climate resilience
31	Inter-sectoral Forum for Agrobiodiversity and Agroecology (ISFAA)	Convene and support multisector actors towards adoption, upscaling and mainstreaming of agroecology and agrobiodiversity in the agri-food system	Enhanced biodiversity, resilient food systems and inclusive policy influence
32	Community Land Action Now (CLAN)	Promote secure land rights, community land governance and sustainable natural resource management under the Community Land Act	Strengthened land tenure security, empowerment of indigenous communities and sustainable resource use
33	Scaling Up Nutrition (SUN) Movement – Kenya Chapter	Advocate for nutrition-sensitive policies, coordinate stakeholders and support integration of nutrition into agriculture and health programs	Improved nutrition outcomes, especially for women and children, and stronger multi-sector coordination
34	Pastoralist Alliance for Resilience and Adaptations Across Nations (PARAAN)	Advocate for pastoralist rights, resilience building and inclusion in policy and development processes	Enhanced resilience of pastoral communities and recognition of indigenous knowledge systems
35	Ardhi Caucus	Advocate for land rights, tenure security and policy reforms supporting equitable land access and use	Strengthened land governance, protection of community land and improved social justice
35	Kenya National Land Coalition (KNLC)	Promote land reforms, tenure security and coordination among land sector actors	Equitable land access, improved land governance and policy influence
37	The National Food Systems Steering Committee	Coordinate national food systems transformation agenda and align stakeholders with UN Food Systems Summit commitments	Coherent policy implementation, improved food system sustainability and national development outcomes