

Kenya

Upper Tana-Nairobi Water Fund (UTNWF)

Detailed design report

Main report

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Currency equivalents

Currency Unit	=	
US\$1.0	=	KSH 100

Weights and measures

1 kilogram	=	1000 g
1 000 kg	=	2.204 lb.
1 kilometre (km)	=	0.62 mile
1 metre	=	1.09 yards
1 square metre	=	10.76 square feet
1 acre	=	0.405 hectare
1 hectare	=	2.47 acres

Abbreviations and acronyms

AC	Advisory Committee
AM	Aide Memoire
ASALs	Arid and Semi-arid Lands
AWPB	Annual Work Plan and Budget
BAT	British American Tobacco
CA	Conservation Agriculture
CAP	Conservation action plan
CBO	Community-based Organisation
CIAT	International Centre for Tropical Agriculture
COMEC	County Monitoring and Evaluation Committees
CSA	Climate-smart Agriculture
CSO	Civil society organisation
DLDD	Desertification, land degradation and drought
DRSRS	Directorate of Resource Surveys and Remote Sensing
EABL	East African Breweries Ltd.
ES	Ecosystem services
EX-ACT	Ex-ante carbon balance tool
EMCA	Environmental Management and Coordination Act
FFS	Farmer field school
FMM	Financial Management Manual
FSIAP	Food Security Integrated Approach Programme
GBM	Green Belt Movement
GEB	Global Environmental Benefits
GEF	Global Environment Facility
GHG	Greenhouse gases
GoK	Government of Kenya
GWC	Green Water Services
IAP	Integrated Approach Programme
ICRAF	World Agroforestry Center
IFAD	International Fund for Agricultural Development
IGA	Income generating activities
INRM	Integrated Natural Resources Management
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
KAPSLMP	Kenya Agricultural Productivity and Sustainable Land Management Project
KCEP-CRAL	Kenya Cereal Enhancement Project – Climate Resilient Agricultural Livelihood Window
KEFRI	Kenya Forestry Research Institute
KENAFF	Kenya National Farmers' Federation
KenGen	Kenya Electricity Generating Company
KFS	Kenya Forestry Service
KM	Knowledge management
KMD	Kenya Meteorological Department
KNBS	Kenya National Bureau of Statistics
LDSF	Land Degradation Surveillance Framework
LUC	Land use change
LULUCF	Land use, land use change and forestry
M&A	Monitoring and Assessment
M&E	Monitoring and Evaluation
MEA	Multilateral Environmental Agreements
MENR	Ministry of Environment and Natural Resources
MMEC	Ministerial Monitoring and Evaluation Committees
MoALF	Ministry of Agriculture, Livestock and Fisheries
MoU	Memorandum of Understanding

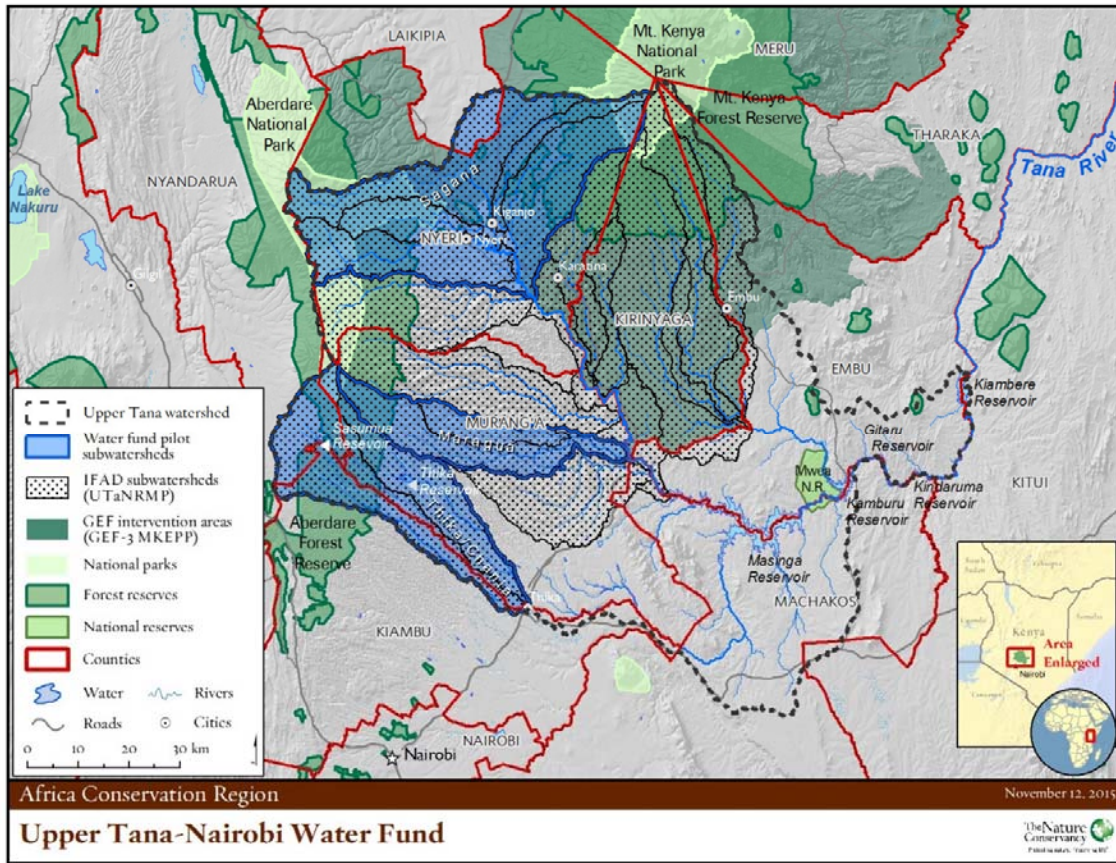
MPAT	Multidimensional Poverty Assessment Tool
MWI	Ministry of Water and Irrigation
NAP	National Action Plan
NAPA	National Action Plan for Adaptation
NBSAP	National Biodiversity Strategies and Action Plan
NCWSC	Nairobi City Water and Sewerage Company
NDEKA	Ndakaini Dam Environmental Conservation Association
NEMA	National Environment Management Authority
NIMES	National Integrated Monitoring and Evaluation System
NGO	Non-Governmental Organisation
NMK	National Museums of Kenya
PES	Payment for ecosystem services
PIM	Project Implementation Manual
PM	Procurement Manual
PMU	Project Management Unit
PPP	Private-Public Partnership
PSC	Project Steering Committee
RAPTA	Resilience, Adaptation Pathways and Transformation Assessment Framework
RCMRD	Regional Centre for Mapping and Resource Development
RIMS	Results and Impact Management System
RIOS	Resource Investment Optimisation System
ROI	Return on Investment
SACDEP	Sustainable Agriculture Community Development Programme
SLM	Sustainable Land Management
STAP	Scientific and Technical Advisory Panel
SWAT	Soil and Water Assessment Tool
TARDA	Tana and Athi Rivers Development Authority
TNC	The Nature Conservancy
TOR	Terms of Reference
TSC	Technical and Scientific Committee
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention for Climate Change
UNREDD	United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation
UTaNRMP	Upper Tana Catchment Natural Resources Management Project
UTNWF	Upper Tana-Nairobi Water Fund project
WEAI	Women's Empowerment in Agriculture Index
WF	Water Fund
WRMA	Water Resources Management Authority
WRUA	Water Resources User Association

Definition of Terms and Key Abbreviations

Term	Definition
Agroforestry	Land-use systems and technologies where woody perennials are deliberately used on the same land-management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence
Resilience	The process of being able to adapt in the face of adversity, trauma, tragedy, threat or significant sources of stress
Climate Resilience	Capacity of a socio-ecological system to: (1) absorb stresses and maintain functions in the face of external stresses imposed upon it by climate change and (2) adapt, reorganise, and evolve into more desirable configurations that improve the sustainability of the system, leaving it better prepared for future climate change impacts.

Term	Definition
Climate-Smart Agriculture	Climate-smart agriculture is an approach to developing the technical, policy and investment conditions to achieve sustainable agricultural development for food security under climate change. CSA employs a range of practices and approaches to farming systems that increase resilience and climate change adaptation potential, while also aiming at mitigation measures.
Conservation Agriculture	Concept for resource-saving agricultural crop production that strives to achieve acceptable profits together with high and sustained production levels while concurrently conserving the environment. CA is characterised by three linked principles, namely: <ul style="list-style-type: none"> • Continuous minimum mechanical soil disturbance. • Permanent organic soil cover. • Diversification of crop species grown in sequences and/ or associations
Ecosystem Services	Benefits that people obtain from ecosystems. Categorised in four clusters: provisioning services, regulating services, cultural services and supporting services
Food Security	Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. Household food security is the application of this concept to the family level, with individuals within households as the focus of concern.
Land Degradation	The reduction in the capacity of the land to provide → ecosystem goods and services and assure its functions over a period of time for its beneficiaries. This can be seen through a loss of biomass, a loss of actual productivity or in potential productivity, or a loss or change in vegetative cover and soil nutrients, or other ecosystem services.
SLM	Sustainable Land Management aims at integrating the management of land, water, biodiversity, and other environmental resources to meet human needs while sustaining ecosystem services and livelihoods.
Smallholder	Farmer with limited area of land to cultivate/ utilise for livestock
UTNWF	Whenever the abbreviation for the Upper Tana-Nairobi Water Fund is used in the PDR, this refers to the GEF-financed project under the FSIAP umbrella programme.
Water fund	Refers to the concept of water funds, i.e. a financing mechanism supported by downstream users to support water quality and quantity through upstream conservation measures
WF	The abbreviation, or the use of the capitalised <i>Water Fund</i> signifies the institution and organisational arrangements to be set up with the support of the UTNWF project. This distinction is important, because the principle of sustainability inherent to the water fund concept requires that organisational structures, management staff, knowledge and experiences instituted or gathered throughout project implementation be merged with this newly established body during project lifetime, i.e. UTNWF will increasingly merge into the WF during project lifetime, with the aim of a full fusion by project end, so that the WF continues to support conservation measures in the Upper Tana basin without requiring inputs or investments from the then ceased UTNWF.
Water Towers (Kenya)	Kenya's main water towers comprise of <i>Mt Kenya, Mau ranges, Mt. Elgon, Cherangani and Aberdare Ranges</i> . The five water towers form the upper catchment areas of all but one major river in Kenya, Ewaso Nyiro. These rivers feed into the major Kenyan lakes and provide environmental services, also essential to agricultural production.
Wetland	Area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands play a number of roles in an ecosystem, principally including water purification, flood control, carbon sink and shoreline stability. Wetlands are also considered the most biologically diverse of all ecosystems, serving as home to a wide range of plant and animal life.

Map of the project area



Executive Summary¹

Strategic Context

1. The Integrated Approach Programme (IAP) comprises three integrated approach pilots that were agreed as part of the sixth replenishment of the Global Environment Facility (GEF) – on sustainable cities, deforestation and food security. The Food Security Integrated Approach Programme (FSIAP) targets agro-ecological systems where the need to enhance food security is directly linked to opportunities for generating local and global environmental benefits. The programme aims to promote the sustainable management and resilience of ecosystems and their different services for land, water, biodiversity, and forests, as a means to address food insecurity. At the same time, it will safeguard the long-term productive potential of critical food systems in response to changing human needs. The FSIAP will be firmly anchored in local, national and regional policy frameworks that will enable sustainable and more resilient production systems and approaches to be scaled up across the targeted geographies in sub-Saharan Africa. The Upper Tana-Nairobi Water Fund Project (UTNWF) represents one of the 12 national projects under the joint FSIAP hub that will contribute to both national and global agendas.

2. Being an integral part of the 12 country regional programme, UTNWF will contribute to the collective impact of this programme, which is intended to inform approaches to food security in the drylands of sub-Saharan Africa towards win-win solutions between food production and maintaining ecosystem services and in face of anticipated climate shocks. Each country project has committed to participating in the peer-peer applied management opportunities which are an integral part and distinct feature of this programme, and which will be cost-shared with the cross-cutting coordination and applied knowledge management and capacity development “hub” project. Countries will both participate in and host site visits and in communities of practice on specific themes of interest and value to multiple IAP countries and which will be defined during the project.

3. In turn UTNWF will benefit from participation in this programme by accessing through the activities delivered by the hub project good practice from the target geography and beyond through peer learning, current thinking on food security policy as well as access to technical expertise on a cost sharing basis where there is interest from multiple project countries. The programme will generate knowledge management products and have an advocacy function which draws upon and creates visibility for the anticipated success stories from the country projects at the level of sub-regional and regional bodies within the context of food security debates and policy making. This programme is coordinated by multiple GEF Agencies with IFAD as the lead agency. The programme will be coordinated via a substantive cross-cutting “hub” project worth \$10.4m and with a full time task manager.

4. **Priorities for IAP support, based on programme components and results framework:** The goal for this proposed GEF-funded project is a well conserved Upper Tana River basin for improved water quality and quantity for downstream users (public and private), maintaining regular flows of water throughout the year; protecting remaining aquatic and terrestrial biodiversity and enhancing ecosystem services, such as soil/sediment retention, nutrient retention, amelioration of land degradation hot spots and water yield – that improve, food security, economic/green growth, and human well-being for upstream local communities.

¹ Mission composition: Stephen Twomlow, Regional Climate and Environmental Specialist, IFAD-ESA/ECD, Uli Piest, Team Leader, Bancy Mati, Natural Resource Management Specialist, Agnese Tonnina, Financial Specialist, Richard Batamanye, Financial Management and Procurement Specialist, Elisa Distefano, M&E Specialist (Rome-based).

5. The Government of Kenya (GoK) is committed to fighting poverty, environmental degradation and food insecurity. The overarching Kenya Vision 2030, the country's development blueprint for the period 2008 to 2030 identifies water as an essential resource to support the planned development activities, particularly agriculture, which is one of the key economic sectors to drive the vision. The vision is operationalised through 5-year medium term plans; the current medium term plan (2013-2017) proposes a comprehensive water resources management programme. Towards this end, a review of the six Catchment Management Strategies (CMS) including the Tana², was done culminating in six respective CMSes covering the period 2014-2022. The CMSes are in line with the over 200 sub-Catchment Management Plans (SCMPs), prepared by local communities through their respective Water Resources Users Associations (WRUAs) among others.³ Kenya's Agricultural Sector Development Strategy (ASDS) 2010-2020 is also based on Vision 2030, with an objective to achieve an annual agricultural growth rate of 7% and to reduce food insecurity by 30% by promoting an innovative, commercially oriented and climate-smart modern agriculture. UTNWF is closely aligned with the strategic objectives of the MENR five year strategic plan (2013-17)⁴ and its sectoral priorities. It will particularly contribute to a) rehabilitation and protection of water towers, b) strengthening environmental governance, c) water resources management, d) green growth promotion, and e) implementation of the Climate Change Action Plan, among others. See also the Attachment 4.2 on the convergence of UTNWF with Kenyan Policies and Strategies; Attachment 4.1 outlines the linkages between UTNWF and strategic aims of UNCBD, UNFCCC and UNCCD.

6. **Baseline scenario:** IFAD is working with The Nature Conservancy (TNC) to build upon both past and current investment programmes that have supported integrated development and food security in the Upper Tana River basin with the GoK, including past GEF3 financing (Mount Kenya Environmental Pilot Project, MKEPP). The current IFAD investment programmes comprise the Upper Tana Catchment Natural Resources Management Project (UTaNRMP) and the Kenya Cereal Enhancement Programme - Climate Resilient Agricultural Livelihoods Window (KCEP-CRAL). Baseline investment from these sources combined is in excess of US\$ 60,000,000 and jointly targets more than 300,000 households farming some 1.7 million ha.⁵ Additional resources, in excess of US\$ 4million have been raised by TNC to launch and pilot the water fund concept in Kenya and to mobilise private sector participation.

7. UNEP, together with the Kenyan NGO Nature Kenya and the National Museums of Kenya (NMK) is currently developing a project proposal for GEF-funding on landscape and ecosystem approaches in the lower Tana basin. Opportunities for close collaboration and exchange of approaches and lessons will be explored. Further GoK investment into relevant baseline projects and programmes is estimated to exceed US\$ 200,000,000; they hold a wealth of experiences and lessons learned for UTNWF and the project will contribute to these projects' objectives. They comprise of, among others:

- Innovative approaches towards the rehabilitation of water towers in Kenya;
- Enhancing conservation of catchment areas through payment for water services in the Aberdares ecosystem;

² WRMA (2014), Catchment Management Strategy for Tana Catchment Area (2014-2022). Water Resources Management Authority.

³ UTNWF is supportive to the major strategies of the Water Resources Management Authority's updated Tana Catchment Management Plan (2014-2022), particularly on water sources and catchment protection and conservation; adaptation and resilience; livelihood enhancement; institutional development; and monitoring and information management.

⁴ MENR (2014). Project Concept Notes. Nairobi, Kenya (discussion paper for development partners)

⁵ "Baseline investments" refers to all investments into projects or policies that provide linkages and/or a tangible foundation for the better achievement of UTNWF targets.

"Co-financing" is reserved for direct cash or in-kind contributions to the UTNWF itself, and investments by closely linked projects and activities during the life of UTNWF that will have a direct effect on UTNWF targets or beneficiaries.

- The Green Schools Programme;
- Improving tree seed/seedling production and management towards achieving 10% tree cover in Kenya;
- Crafting a green future - promoting bamboo micro-industries in five major water towers;
- Facilitated knowledge sharing and livelihoods transformation for climate change adaptation in Kenya;
- MITI PESA (*Promoting Enterprise through Sustainable Afforestation*).

Rationale

8. Forests and wetlands in the Upper Tana play an important role in maintaining water quality and quantity, providing areas where runoff water and sediment can be stored and filtered naturally. However, since the 1970s, forests on steep hillsides and areas of wetlands have been converted to agriculture. As a result, sedimentation is becoming a serious problem, reducing the capacity of reservoirs and increasing the cost for water treatment. Today, 60% of Nairobi's residents are water insecure, while 95% of the water used and consumed in Nairobi is coming from the Upper Tana catchment. The challenges to water security will likely grow as climate change brings increasingly unpredictable rainfall, equally challenging the resilience and food security of upstream smallholder farming systems.

9. The concept of water funds is based on the principle that it is cheaper to prevent some water problems at the source than it is to address them further downstream. Investments in green infrastructure using natural systems and its services to trap sediment and regulate water often provide a more cost-effective approach than relying solely on grey infrastructure such as reservoirs and treatment systems. Water funds have been successfully implemented elsewhere in the world to help secure the water quality and supply of major cities including New York, Quito, Rio de Janeiro, and Lima, among others. The UTNWF will be the first of its kind in Africa. The UTNWF as a public-private-partnership of donors and major water consumers 'at the tap' will contribute to the initial endowment of the Water Fund (WF) to support water and soil conservation measures 'at the top'. These measures benefit local farmers' livelihoods, food security and resilience through increasing agricultural yields and introducing climate-smart agricultural techniques, and thus reducing soil erosion that is so damaging both to crop production and to downstream water quality and supply.

Project Area and Target Groups

10. In Kenya, the integrated approach of the UTNWF will be piloted in three Counties (Muranga, Nyeri and Nyandarua) of the Upper Tana River basin, which covers 17,000 km² with 5.3 million inhabitants. This basin includes two of Kenya's five "water towers", the maintenance of which is a key environmental, agricultural and economic priority of the GoK: the Aberdare Mountains and Mount Kenya. It is home to critical indigenous and endangered flora and fauna and sustains important aquatic biodiversity and drives agriculture that feeds millions of Kenyans. Although the water towers lie largely within protected areas, further downstream the river is being choked by sediments and dry season flows are depleted due to poor land and water management practices. Millions of people and the iconic wildlife that depend on the river bear the brunt of these impacts. This is amplified by the impacts of climate change that increases sediment load in times of severe rainfall events which are of increased frequency.

11. The Project will work with public and private sector partners to establish the Water Fund as a sustainable financing mechanism to support sustainable land management and integrated natural resource management approaches in the Upper Tana catchment. Through its network of public agencies, NGO and CBO, the Project will support at least 21,000 smallholder households, i.e. about 100,000 individuals in the Upper Tana catchment to adopt climate-smart sustainable land management practices, with the aim to increase food security

and climate adaptation potential at household level, to stabilise and restore ecosystem services of the targeted area and to improve water quality and quantity for both upstream and downstream water users.

12. The main downstream water users are private companies and utility providers, the most important ones, such as East Africa Breweries, Coca Cola, Unilever, Nairobi Water and Sewerage Company (NWSC), and Kenya Electricity Generating Company (KenGen), are already engaged as partners in the establishment of the Water Fund. Nairobi City itself counts about 4 million inhabitants, whose water needs are almost entirely supplied by resources extracted from the Upper Tana basin. It is therefore not far-fetched to include Nairobi city dwellers as secondary beneficiaries of UTNWF investments.

Project Description

13. The goal of the Project is that “*The Upper Tana-Nairobi Water Fund as a Public-Private-Partnership increases investment flows for sustainable land management and integrated natural resource management in the Upper Tana catchment*”. As such, UTNWF will contribute to the overall objective of the GEF FSIAP – Support countries in target geographies for integrating priorities to safeguard and maintain ecosystem services into investments improving smallholder agriculture and food value chains – through the below implementation structure:

14. **Component 1: Water Fund Management Platform institutionalised.** The project will work closely with private and public partner organisations to establish the Water Fund (WF) as a Charitable Trust registered under Kenyan law and governed by a Board of Trustees (outcome 1.1). The Board of Trustees will manage the overall operations of the WF, which will have a set of advisory committees at both national and at county levels, to allow for good collaboration between governmental and WF activities and the uptake of lessons and practices into policy and catchment management processes, and a Technical Secretariat, responsible for the day-to-day management of its activities.

15. Upon legal registration of the WF, the financial management system will be established (outcome 1.2), to allow for the capitalisation of the endowment through funds from its public, private and international partners. The WF's finance mechanism will equally include a periodic replenishment through fees and further contributions by public, private and international donors. The Nairobi City Water and Sewerage Company (NCWSC), in anticipation of the WF becoming a legal entity, e.g. already explored opportunities, and a levy on water prices specifically for conservation purposes was agreed by the GoK and gazetted on 2nd of October 2015.⁶

16. In order to disburse funds, clear indicators for payments for ecosystem services, including the targeting and prioritisation of initiatives and stakeholders in the Upper Tana catchment, will be developed, and also based on assessments of stakeholder needs and expectations, so as to be responsive to local requirements. The establishment of national and county level advisory structures will be supportive to this goal.

17. Tools for the economic monitoring of return on private sector investment will be integrated into the WF management structure. The success of the WF will be measured against its ability to disburse funds and to provide incentives for catchment management and to improve downstream water quality and quantity. Particular attention will be paid to good targeting, i.e. to what extent most vulnerable beneficiaries such as poor and food insecure women, youth and female-headed households benefit from WF incentives and whether the incentive schemes employed are appropriate to the needs of these vulnerable beneficiaries. Another indicator will be to what extent the actions and PES schemes employed by the WF will find traction in county and national policies and strategies, e.g. on coordinated watershed

⁶ Kenya Gazette Notice Link: <https://tnc.box.com/s/4fuh2ccepsi8ytha23t2tqjmrsrw8gb9>

management, and how lessons learned can be scaled out to other watertowers in Kenya and beyond, a priority for MENR (close linkage with component 3).

18. Component 2: Improved Upper Tana catchment ecosystems that support livelihoods, food security and economic development. The aim of investment flows for SLM and INRM to the catchment area, by the UTNWF project - and increasingly by the WF itself to sustain these investments - is to foster adaptation and to increase the resilience of the local population through improved food production, household incomes and diversified development options and livelihoods, with due reference and disaggregation of support and results by gender and age.

19. Financial, in-kind and technical support will be provided by the project to SLM initiatives based on a modelling approach linking spatial prioritisation with an impact assessment for soil and water conservation, and an analysis for return on investment. A baseline of priority locations and most promising SLM activity areas was established, including riparian management and wetlands protection for vegetation buffering along riverbanks; reforestation and adoption of agro-forestry practices to reduce GHG emissions and increase carbon stocks; terracing of hill slopes on steep and very steep farmland; road erosion mitigation and quarry management. These can be provided as direct incentives (tree seedlings or support for village nurseries), financial subsidies (e.g. materials and support for terracing), non-financial incentives (e.g. capacity development, or support to village institutions) or payments for ecosystem services (e.g. subsidised biogas plants for good riparian management). How to specify these incentives and services and how to ensure that these target and reach women, youth and the most vulnerable will have to be detailed by the advisory bodies of the WF upon its establishment. Using specific tools will have to be considered, such as reducing tasks in and time for firewood collection (improved stoves, biogas etc.), access to land and water, youth employment opportunities (e.g. in biophysical conservation measures, nurseries etc.), or improving women's and youth representation and decision making in local institutions.

20. The combination of biophysical and agricultural techniques and support for water management is expected to lead to diversified production and increased yield through improved soil retention; broadened adaptation potential and resilience through reduced erosion upstream, as well as at least stabilised catchment ecosystem services. Downstream economic benefits will include reduced water treatment costs through reduced sediment concentration and increased hydropower generation through higher water yield and reduced sedimentation. For further details on the expected local and global environmental benefits and impacts, please also refer to Attachment 6.1.

21. Component 3: Robust knowledge management and learning systems implemented to direct UTNWF management and share lessons both nationally and regionally. Strong emphasis will be placed on M&E frameworks to a) support WF decision making and allowing for an adaptive management approach to the targeted incentive schemes, and b) to allow for upscaling, policy integration and replication of lessons learned as quickly as feasible.

22. Community, county and national institutions will be trained and capacitated to assess the state and trends of ecosystem services, climate resilience and adaptation capabilities, and to integrate assessment results into policy making at respective scale. Therefore, the UTNWF M&A framework will be closely aligned with the National Integrated Monitoring and Evaluation System (NIMES); coordinated with the respective County Monitoring and Evaluation Committees (COMECs); and reflect the convention targets that are relevant to the global environmental benefits supported by GEF-funding and among the GoK obligations as a party to these MEAs.

23. Biophysical monitoring tools and approaches, such as the Land Degradation Surveillance Framework (LDSF) will be integrated into partner organisations' monitoring procedures. IFAD's Multidimensional Poverty Assessment Tool (MPAT) will form a core part

of the Project's M&E framework to allow for the monitoring of socio-economic parameters, including for gender disaggregated livelihoods. To account for an appropriate gender analysis and inclusion of climate change resilience and adaptation strategies, the MPAT tool kit will be expanded with the Women's Empowerment in Agriculture Index (WEAI)⁷, and tools and concepts from the GEF's Resilience, Adaptation Pathways and Transformation Assessment Framework (RAPTA). Wetland biodiversity will be mapped and related information be compiled into an Upper Tana Wetland Atlas, and the avoided carbon emissions and sequestration, e.g. through land use changes and agroforestry will be measured through the EX-ACT tool.

24. To disseminate and scale-up its results and lessons to be learned, the Project aims at establishing an information centre at the Ministry of Environment and Natural Resources, the National Museums of Kenya and at county level. Lessons and experiences in establishing the WF's public private partnership and in establishing successful payment for ecosystem services mechanisms will be brought to the Cherangani (Embobut/Chebara) and Mau (Mara Catchment) watertowers in Kenya to assess the feasibility of replication and adaptation of the approach.

25. UTNWF adds value to, and provides an outcome pathway and long term sustainability for the investments the GoK is making with IFAD through its loan projects, UTaNRMP and KCEP-CRAL, and initial investments made by The Nature Conservancy and public and private sector partners in the Upper Tana Catchment. It is designed to add value to UTaNRMP and KCEP-CRAL and vice versa (see table 1 in the Appendices). Nationally, the Project is closely tied into a broad array of policy targets (see Attachment 4.2) and responds to multiple SDGs and MEA objectives and national reporting requirements under these (see Attachments 4.1 and 4.3).

26. Considering the pressing need for sustainable land management, the Upper Tana is undergoing substantial land use changes which involve non guided choices on how the landscapes are managed by farmers and other local resource users. Recent studies indicate that portions of areas under tea cultivation may transition to cereals and other agricultural produce. CIAT intends to explore feasible and gainful options along agricultural intensification gradients, which decision makers, investors and farmers can use for sustainable outcomes. CIAT will conduct a mapping of key decision-makers (in partnership with SACDEP and WRMA), review current agricultural intensification policies pertinent to the Tana Basin, and then develop trade-off indicators and tools using a suite of bio-economic tools co-developed with partners. During this process, there will be iterative reviews through focus group discussions which will be complemented by the baseline survey conducted by TNC in 2014. This will help produce a matrix and decision analysis with local partners for scenario visioning exercises. Together with national partners, specifically SACDEP, KENAF and WRMA, CIAT will lead to the formulation of sustainable intensification gradients from the plausible stakeholder scenario options.

Organisational Framework

27. UTNWF will be executed by The Nature Conservancy (TNC), together with several implementation partners, including the Ministry of Environment and Natural Resources, National Museums of Kenya, Water Resources Management Authority and Kenya Forest Services, through a direct grant agreement between IFAD and TNC, with disclosure to the National Treasury.⁸ TNC will be in charge of day-to-day project management, together with a broad array of implementation partners, including the Public and Private Sector Partners that will constitute the Board of Trustees of the Water Fund, Research Institutions and at least three County Governments. To exercise its oversight, MENR, representing the GoK, will work with the executing agency/project management unit to establish a Project Steering Committee

⁷ For more detail, please refer to IFPRI's WEAI resource center: <http://www.ifpri.org/topic/weai-resource-center>

⁸ Aide memoire between GoK and IFAD, 20 August 2015.

and a Technical and Scientific Committee with appropriate representation from UN convention focal points and both national and county levels to ensure alignment of the Project to ongoing programmes and activities and Public and Private Sector partners/members of the UTNWF. To facilitate initial priority activities and to recruit key staff as quickly as possible, an IFAD-funded start-up financing will be available upon project approval by the GEF and the signature of a grant agreement between TNC and IFAD.

28. The project management unit (PMU) will include key staff for project management and administration, work plan preparation and implementation and financial control. The unit will comprise of the GEF Project Manager, a Monitoring and Evaluation Officer, a Field Conservation Coordinator, three Field Extension Assistants. In addition, junior professional staff and logistics and administrative support is included in the PMU. It is envisaged that with the full establishment of the Water Fund and increasing achievement of project results, the responsibilities and functions of the PMU will be gradually transferred to the Water Fund, taking over full responsibility toward the end of the 5 year project cycle.

29. **Project monitoring.** Monitoring of UTNWF will reflect the convention targets that are relevant to the global environmental benefits supported by GEF-funding, as well as socio-economic and food security goals of both the stakeholders in the catchment and the private sector investors (e.g. impacts in terms of costs/reliability of water quantity and quality for downstream users). An initial outline on the monitoring requirements is included in the Logical Framework and in Appendix 6.

30. **Project supervision and review.** IFAD will undertake supervision, mid-term review and completion missions. It will field missions that combine addressing IFAD, GoK and GEF concerns. As is IFAD's standard operation procedure, representation from government will be included in all supervision missions; the project managers of UTaNRMP and KCEP-CRAL will also be invited to join the supervisory missions to strengthen project interactions and learning; both project managers will also be members of the UTNWF steering committee, to further increase collaboration and linkages among the projects. Upon completion of each mission an Aide Memoire will be discussed and agreed with GoK and the executing agency; and for each mission a single report will be filed, which meets IFAD, GoK and GEF requirements. A key responsibility of the supervision is to review progress against the declared targets set in the Project's logical framework and the progress towards the seamless integration of the UTNWF into the WF. To monitor the policy aims of UTNWF, IFAD PTA policy experts will be invited to join project supervision missions. The project shall avail resources to the Ministry of Environment and Natural Resources for monitoring activities, including the GEF National Steering Committee representation. If mission timings allow, missions will be combined with supervisions for UTaNRMP or KCEP-CRAL.

Logical Framework

Results Hierarchy	Indicators				Means of Verification			Assumptions
	Description	Baseline (BL)	Mid-Term	End Target	Source	Frequency	Responsibility	
Project Goal: The Upper Tana-Nairobi Water Fund as a Public-Private-Partnership increases investment flows for sustainable land management and integrated natural resource management in the Upper Tana catchment	1. 21,000 smallholder farmer households with improved food-security, climate change adaptation and resilience capabilities (gender- and age disaggregated) (RIMS 1.8.2)	1. 0%	1. 30% over BL	1. 100%	1. RIMS survey	1. Project start (BL); mid-term; project end	1. PMU	National and county governments supportive of the WF concept
Development Objective: A well-conserved Upper Tana River basin with improved water quality and quantity for downstream users (public and private); maintaining regular flows of water throughout the year; enhancing ecosystem services, specifically food security, freshwater and terrestrial biodiversity, and improving human well-being and quality of life for upstream local communities.	2. 21,000 smallholder farmer households adopt climate-smart SLM practices (gender- and age disaggregated)	2. 0%	2. +30% over BL	2. 100%	2. LDSF survey	2. Project start (BL); mid-term; project end	2. PMU	Downstream water users (public and private) are interested in supporting upstream SLM and watershed conservation to improve water quality and quantity

Component 1: Water Fund Platform institutionalised

Outcome 1.1: Multi-stakeholder and multi-scale platform supports policy development, institutional reform and upscaling of INRM	3. WF operational	3. Zero	3. WF by-laws established	3. WF by-laws registered	3. Certificate of registration	3. Mid-term; project end	3. PMU	Proposed Public Benefits Act supports UTNWF establishment
	4. Relevant policies and strategies refer to the WF as an incentive model	4. Zero	4. ≥ 4 policies and strategies at national/county levels	4. ≥ 6 policies and strategies at national/county levels	4. Official documentation records	4. Mid-term; project end	4. PMU	Policies and strategies open for amendment and addition
Outcome 1.2: Policies and incentives support climate smart smallholder agriculture and food value chains in financially viable and sustainable watershed stewardships	5. WF provides incentives to smallholder farmers	5. Zero	5. Incentive funding available through WF account and/or endowment	5. Reward schemes are agreed upon and payments are delivered, based on local priorities	5. WF disbursement records	5. Mid-term; project end	5. PMU	Smallholder farmers interested in joining incentive schemes
	6. Coordinated watershed management policies at county and federal levels	6. Overlapping scales and responsibilities	6. Input into 3 county development plans and sectoral strategies	6. 3 county development plans coordinated with WRMA	6. Official documentation records	6. Mid-term; project end	6. PMU	Policy and strategy formulation at local, county and national level can be coordinated

Component 2: Improved Upper Tana catchment ecosystems that support livelihoods, food security and economic development

Outcome 2.1: Increased land area, freshwater, and agro-ecosystems under INRM and SLM	7. SLM implemented on 337,000 ha (RIMS 1.1.17)	7. 0 ha	7. 50,000 ha	7. 100%	7. Project reports; M&E records	7. Project start; mid-term; project end	7. PMU	UT smallholders are actively supporting SLM and INRM approaches
	8. 663,000 ha influenced to adopt SLM	8. 0 ha	8. 100,000 ha	8. 100%	8. Project reports; M&E records	8. Project start; mid-term; project end	8. PMU	Stakeholders commit to adopt new practices
	9. GHG emissions avoided and/or sequestered (RIMS 1.1.18)	9. TBD	9. TBD	9. 10% over baseline through LUC	9. Project reports; M&E records	9. Project start; mid-term; project end	9. PMU	Land use changes can be facilitated and are accepted
	10. Increased ability of people to manage environmental and climate-related risks (RIMS 2.6.5)	10. TBD	10. 30%	10. 21,000 households engaged in SLM, climate risk reduction and DRR activities	10. Project reports; M&E records	10. Project start; mid-term; project end	10. PMU	DRR and climate risk reduction activities are widely accepted by smallholders

Component 3: Robust knowledge management and learning systems implemented to direct UTNWF management and to share lessons both nationally and regionally								
Outcome 3.1: Institutions capacitated to monitor Global Environmental Benefits (GEBs)	11. GEB monitoring tools and protocols integrated with partner institutions	11. Zero	11. ≥ 2 LDSF updated/ completed 11. ≥ 10 biophysical monitoring stations upgraded/ operational 11. WRMA prepared to house water-quality database	10. LDSFs for at least 5 sub-watersheds updated/ completed 11. 26 monitoring stations upgraded/ operational 11. A water-quality database established and integrated into WRMA system	11. Project reports; M&E records	11. Mid-term; project end	11. PMU	Institutional processes allow for integration of monitoring protocols
Outcome 3.2: M&A framework supports the integration of climate resilience into policy making	12. MPAT and RAPTA survey results referenced in county development plans	12. Zero	12. 2 MPAT surveys conducted	12. MPAT survey results referenced in ≥ 2 county development plans	12. Project reports; M&E records	12. Project start (BL); mid-term; project end	12. PMU	RAPTA tools available and compatible County development agencies open for new approaches.
Outcome 3.3: Knowledge management and sharing of lessons learned is facilitated	13. Information sharing platforms established	13. Zero	13. 1 county level info centre	13. 1 county and 1 national info centre	13. Project reports	13. Mid-term; project end	13. PMU	Partner organisations willing to establish and operate information centres
	14. Number of inputs to meetings held at national, regional and international levels	14. Zero	14. Inputs/ presentations at ≥ 5 meetings at national, regional and international levels	14. Inputs/ presentations at ≥ 10 meetings at national, regional and international levels	14. Project reports	14. Mid-term; project end	14. PMU	Opportunities for influencing dialogues present themselves
	15. Lessons learned outscaled to at least 2 other catchment areas in Kenya	15. Zero	15. Lessons learned for scaling out are prepared	15. ≥ 2 feasibility studies conducted	15. Project reports	15. Mid-term; project end	15. PMU	Other watertowers and relevant authorities interested and engage in feasibility studies

Summary of Economic and Financial Analysis

Table A

F I N A N C I A L A N A L Y S I S		Crop Models 1 acre/livestock models												Farm Models				
		Incremental Benefits (KES)																
		Maize/Beans	Coffee	Tea	Macadamia	Avocado	Tomato	Spinach	Tomato DI	Spinach DI	Sweet Potatoes	Dairy Cattle	Fixed Dome 12 m3	Farm 1	Farm 2	Farm 3	Farm 4	Farm 5
	PY1	4,943	- 114,250	- 323,379	- 32,016	- 27,816	- 18,400	- 18,500	- 36,800	- 41,700	- 15,122	- 380,480	- 99,860	- 511,410	- 413,465	- 381,819	- 413,638	- 513,498
	PY2	5,871	- 96,500	- 32,229	- 21,956	- 21,136	1,400	3,700	15,000	10,500	4,322	226,020	95,314	10,554	214,094	114,130	- 551,249	- 455,935
	PY3	11,385	30,500	- 32,229	52,358	- 21,456	19,000	7,900	23,600	19,700	5,567	226,020	95,314	137,607	233,754	134,872	188,328	283,642
	PY4	20,054	53,900	157,771	86,234	3,724	18,600	17,900	41,200	34,700	5,567	228,920	95,314	172,853	250,336	166,065	422,910	518,224
	PY5	25,022	115,900	175,171	85,604	22,684	27,600	32,900	68,200	54,700	5,567	228,920	95,314	232,893	262,648	195,477	449,425	544,739
	PY6	23,981	133,900	192,171	99,101	34,554	27,600	32,900	68,200	54,700	5,567	128,920	95,314	172,585	163,165	117,243	471,850	567,164
	PY7	23,981	133,900	200,771	106,084	41,584	27,600	32,900	68,200	54,700	5,567	228,920	95,314	254,687	263,863	198,692	363,217	458,531
	PY8	23,981	133,900	200,771	106,084	41,584	27,600	32,900	68,200	54,700	5,567	228,920	95,314	254,687	263,863	198,692	483,217	578,531
	PY9	23,981	133,900	200,771	106,084	41,584	27,600	32,900	68,200	54,700	5,567	228,920	95,314	254,687	263,863	198,692	483,217	578,531
	PY10	23,981	133,900	200,771	106,084	41,584	27,600	32,900	68,200	54,700	5,567	228,920	95,314	254,687	263,863	198,692	483,217	578,531
	NPV (KES) (@12%)	93,192	216,676	268,611	308,009	39,780	82,147	89,394	200,280	150,137	11,989	694,303	364,283	371,099	764,719	427,678	777,414	1,141,697
	NPV (US\$)	886	2,060	2,553	2,928	378	781	850	1,904	1,427	114	6,600	3,463	3,528	7,269	4,065	7,390	10,853
	FIRR (@12%)	-	31%	25%	88%	23%	71%	68%	80%	62%	32%	57%	95%	26%	55%	37%	30%	37%

Table B

PROJECT COSTS AND INDICATORS FOR LOGFRAME						
TOTAL PROJECT COSTS (in million USD)				33.6		PMU 2.6
Beneficiaries	94,500	People	21,000	House holds		
Cost per beneficiary	356	USD x person	1,600	USD x HH	Adoption rates	100%
Components and Cost (USD million)			Outcomes and Indicators			
<u>Water Fund Management Platform Institutionalised.</u>	7.6		Outcome 1.1: Multi-stakeholder platform supports policy, institutional reform and upscaling of INRM	WF operational; 4. ≥6 policies and strategies refer to WF		
			Outcome 1.2: Policies and incentives support CSA and value chains in watershed stewardships	WF provides incentives; Coordinated watershed management policies at country and national levels		
<u>Improved Upper Tana Catchment Ecosystems that Support Livelihoods, Food Security and Economic Development.</u>	18.7		Outcome 2.1: Increased land area, freshwater, and agro-ecosystems under INRM and SLM	SLM implemented on 337,000 ha; SLM adopted on 663,000 ha; 1,6 million tons of CO2 emissions avoided; 21,000 hh engaged in SLM		
			Outcome 3.1: Institutions monitor GEBS	LDSFs for at least 5 sub-watersheds; water-quality database at WRMA; MPAT results referenced in ≥2 county		
<u>Robust Knowledge Management and Learning Systems.</u>	4.6		Outcome3.2: M&A framework supports integration of climate resilience into policy making	development policies; 2 information sharing platforms; 10 presentations at international meetings; ≥2 feasibility studies conducted		
			Outcome 3.3: Knowledge management facilitated			

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Table C

MAIN ASSUMPTIONS & SHADOW PRICES ¹					
FINANCIAL	Output	Av. Incremental Yields (%)	Price (KES/kg, KES/l)	Input prices	Price (KES)
	*Maize &	43%	20	DAP	50-80
	* Dry Beans Intercropped	43%	45	CAN	50
	Coffee	69%	45	Insecticides (ml)	300.0
	Tea	20%	30	SSP Fertilizer for Planting	23
	**Macadamia	80%	70	Seeds Maize (Kg)	100-250
	**Avocado	53%	3 per unit	Seeds Beans (kg)	100
	Tomato	20%	18		
	Spinach	39%	10		
	Tomato DI	39%	18		
	Spinach DI	61%	10		
	Sweet Potato	60%	2		
	Dairy Cattle	28%	29		
ECONOMIC	Official Exchange rate (OER)	105.2		Opportunity Cost of Capital	12%
	Shadow Exchange rate (SER)	115.7		Social Discount rate	12%
	Standard Conversion Factor	0.91		Output conversion factor (average)	0.6
	Shadow Wage Rate Factor (SWRF)	0.87		Input Conversion factor (average)	0.8

¹Average yield increase compared to first year of WP because WOP is maize as a standalone crop.

²Average yield increase compared to first year of WP because WOP is represented by maize only or foregone income.

Table E

		Total Net	NET INCREMENTAL COSTS (KES)				Cash Flow (USD '000)
		Incremen- tal	Economic Investment	Economic Recurrent	Total Increment		
		Benefits	Costs	Costs	al Costs		
E C O N O M I C A N A L Y S I S	PY1	-16689	5,427.2	538.1	5,965		-22,655
	PY2	-29355	5,622.4	526.1	6,149		-35,503
	PY3	-34313	6,589.9	520.1	7,110		-41,423
	PY4	-693	5,308.5	490.8	5,799		-6,492
	PY5	30733	4,498.8	480.0	4,979		25,754
	PY6	40410		516.0	516		39,894
	PY7	41706		516.0	516		41,190
	PY8	41297		516.0	516		40,781
	PY9	44390		516.0	516		43,874
	PY10	47993		516.0	516		47,477
	PY11	22407		516.0	516		21,891
	PY12	-5124		516.0	516		-5,640
	PY13	-29459		516.0	516		-29,975
	PY14	-693		516.0	516		-1,209
	PY15	30733		516.0	516		30,217
	PY16	40410		516.0	516		39,894
	PY17	41706		516.0	516		41,190
	PY18	41297		516.0	516		40,781
	PY19	44390		516.0	516		43,874
	PY20	47993		516.0	516		47,477
		NPV@12% (USD)		49,970			
		NPV@12% (KES)		5,256,883			
		EIRR		20%			

Table D

HHs Phasing in						
	PY1	PY2	PY3	PY4	PY5	Total
Phasing in	20%	30%	40%	10%	0%	100%
Total HHs	4200	6300	8400	2100	0	21000
HHs per Farm 1 (coffee zone)	1400	2100	2800	700	0	7000
HHs per Farm 2 (gen. agriculture zone)	929	1394	1859	465	0	4647
HHs per Farm 3 (gen. agriculture with Drip Irrigation)	471	706	941	235	0	2353
HHs per Farm 4 (tea zone)	1375	2075	2775	675	0	6900
HHs per Farm 5 (tea zone with biogas system)	25	25	25	25	0	100
Total HHs	4200	6300	8400	2100	0	21000

Table F

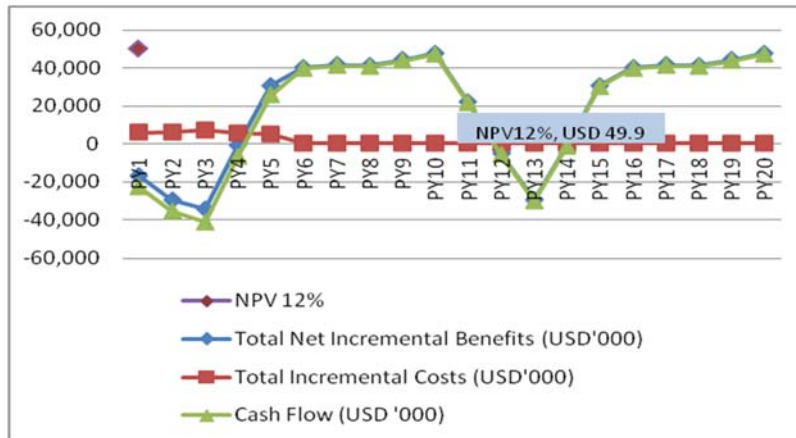


Table G

SENSITIVITY ANALYSIS (SA)				
	Δ%	Link with the risk matrix	IRR (%)	NPV (USD M)
Base scenario			20%	49,970.375
Project benefits	-20%	Market/price fluctuations (changes in market demands). Changes in import/export regulations. Low crop yields. Delays in Project implementation.	18%	33,484,739
Project benefits	-50%		15%	12,005,461
Project costs	20%	Market/price fluctuations (changes in market demands). Changes in import/export regulations. Procurement risks.	19%	43,045,591
Project costs	50%		17%	35,907,590
Project implementation	1 year delay	Unexpected delays in establishing the WF, delays in recruiting the new staff, any other unforeseeable event.	18%	35,721,363
Project implementation	2 years delay		17%	25,266,563
Fluctuations in Carbon's Price (USD)	\$0	Fluctuation of carbon price. Unforeseeable event. Carbon sequestration' results are not as expected.	20%	47,804,258
	\$8		20%	52,136,492
	\$20		21%	56,366,973

Strategic context and rationale

A. Country and rural development context

1. **Economy:** Kenya covers a total area of 582,646 km², of which 1.9% or 11,230 km² is water bodies. Of the remaining 571,416 km² landmass, some 490,000 km² (or 84% of total land mass) comprises arid and semi-arid lands (ASALs) which are characterised by low, erratic rainfall, high evapotranspiration rates, poor soil fertility and few water resources. The remaining 16% of Kenya's landmass is of high and medium agricultural potential with adequate and reliable rainfall. This potentially arable land is dominated by commercial agriculture with cropland occupying 31%, grazing land 30% and forests 22%, the rest being settlements and urban areas. These zones host the largest proportion of Kenya's population (64%) most of them in central and western parts of the country, where the population density is in some cases higher than ten times the national average of 69 persons/km². Administratively, Kenya is divided into 47 Counties, in a devolved system of Government introduced under the new constitution⁹, in which certain functions of the national government were transferred to the 47 counties. Devolution has wide-ranging implications for the implementation of new projects and initiatives in the country.

2. **Rural Poverty:** The incidence of poverty in Kenya has dropped, from 52.2% in 1997 to 46% in 2013¹⁰. The country ranks 147/186 in the Human Development Index¹¹. Within the high potential areas of Kenya, despite having relatively high rainfall, the Land units are small, averaging less than two hectares per capita. The region is home to 44.3% of Kenya's population, and given its small size in terms of land area, it also has the highest population density. Rapidly expanding urban centres in the highlands continually cause agricultural land sizes to decline and expansion of agricultural land is highly limited. Thus, high population density, rapid growth, and intensive farming practices all contribute to the environment challenges facing the region, including deforestation, erosion, and diminishing water resources. Paradoxically, these high potential areas also host a large numbers of poor people, with poverty prevalence estimated¹² at about 35.4%. Despite smaller landholdings, the favourable climate lends itself to high value agriculture, while good infrastructure generally provides better access to urban markets. These opportunities have not been fully exploited to benefit smallholders in Kenya's water towers.

3. **Food Security and Nutrition:** Over 10 million Kenyans suffer from chronic food insecurity and poor nutrition. It is estimated that at any one time about two million people require assistance to access food. During periods of drought, heavy rains and/or floods, the number of people in need can quickly double.¹³ According to the Kenya National Nutrition Action Plan (2012-17), 35% of children under age of five years are stunted, 16% are underweight and 7% are wasted. This means an estimated 2.1 million children are stunted, which is a serious national development concern as these children will never reach their full physical and mental potential. Regional disparities in nutrition indicators in Kenya are significant with the North Eastern province having the highest proportion of children exhibiting severe wasting (8%) while the Eastern province has the highest level of stunted children (44%). As in many other parts of the world, children living in rural areas and children from poorer households in Kenya are more likely to be malnourished¹⁴ In addition, the proportion

⁹The Constitution of Kenya (2010). The Government of the Republic of Kenya.

¹⁰ Kenya Population situation analysis. UNFPA, 2013
(<http://countryoffice.unfpa.org/kenya/drive/FINALPSAREPORT.pdf>)

¹¹ Human Development Index (HDI), 2014.

¹² Agricultural Growth and Poverty Reduction in Kenya, 2012.

¹³ Kenya National Food and Nutrition Security Policy, 2011.

¹⁴ Kenya Demographic and Health Survey (KHDS), 2008/09.

of wasted and underweight children is negatively correlated with the level of education, wealth and nutrition status of the mother.

4. Food security and nutrition data is not available disaggregated by counties, but by province only; however, as the UTNWF target area and beneficiaries belong to the Central Province of Kenya, approximations are possible. According to the Kenya Demographic and Health Survey (KDHS, 2008/09), children under the age of five classified as malnourished according to three anthropometric indices of nutritional status – height-for-age (stunting), weight-for-height (wasting), and weight-for age (underweight) – in Central Province are at 25.7, 4.5 and 16.7% respectively. These indicators can also serve as proxies for food insecurity and are only marginally better than the Kenyan mean percentages (29% stunted, 6.9% wasted and 20.4% underweight children). The data for women show similar patterns, i.e. 16.7% women in Central Province are shorter than 1.45m in height, associated with past socioeconomic status and nutrition during childhood and adolescence, compared with the Kenyan mean of 20.4%.

5. While the main aim of the FSIAP and hence the UTNWF is to pilot linkages between opportunities for generating global environmental benefits and approaches to enhance food security in agro-ecological systems, nutritional aspects are not at the forefront of the project strategy. Nevertheless, the close linkages with KCEP-CRAL provide good opportunity to learn from experiences, particularly regarding the nutritional aspects covered by the WFP-led components of KCEP-CRAL and to incorporate relevant behavioural change models in UTNWF communication and training activities.

6. **Agriculture and smallholder farming:** The agriculture sector is the mainstay of Kenya's economy, contributing 27.3% of the GDP in 2014¹⁵. The sector accounts for 65% of Kenya's total exports, 75% of industrial raw materials, 60% of export earnings, as well as 18% and 60% of the formal and total employment respectively¹⁶. Crop production comprising industrial crops, food crops and horticulture accounts for 82% of agricultural GDP and 94% of export earnings from agriculture. The remaining three subsectors of agriculture - livestock, fisheries and forestry currently account for 18% of agricultural GDP and 8% of export earnings from agriculture, but still have significant potential not fully exploited. Meanwhile, Kenya's agriculture¹⁷ is predominantly small-scale farming where production is carried out on farms averaging 0.2–3 ha, mostly on a commercial basis. This small-scale production accounts for 75% of the total agricultural output and 70% of marketed agricultural produce. Small-scale farmers produce over 70% of maize, 65% of coffee, 50% of tea, 80% of milk, 85% of fish, and 70% of beef and related products. However, despite recent improvements, access to financial services remains limited with farmers relying mainly on costly and inadequate informal financial systems.

7. **Women and Youth:** Traditional norms have in the past and continue at present to disadvantage both women and youth in Kenya, in terms of access to resources and decision making. For instance, only 29% of those earning a formal wage throughout the country are women, leaving a huge percentage of women to work in the informal sector. Furthermore, 54% of agricultural workers are women providing the bulk of the labour force in agriculture¹⁸. Yet few women own assets such as land. As a result, poverty in Kenya has a gender and age dimension, due to the gender disparities that exist in terms of access, ownership and control of productive resources, as well as differences in capabilities. Meanwhile, Kenya has ratified various international¹⁹ and regional protocols²⁰ on gender equality and women empowerment.

¹⁵ Economic Survey, (2015). The Kenya National Bureau of Statistics, Government of Kenya

¹⁶ Republic of Kenya, 2013. Second Medium Term Plan (2013-2017).

¹⁷ Government of Kenya, 2010. Agricultural Sector Development Strategy (2010–2020)

¹⁸ Kenya Labour market profile, 2014. Danish Trade Union Council for International Development Cooperation

¹⁹ Convention on the Elimination of All Forms of Discrimination against Women. UN General Assembly, 1981

²⁰ Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa. African Union, 1995.

Nationally, both the National Gender and Equality Commission Act enacted from 2011, as well as the new Constitution (2010) promote gender equality and women empowerment. Women's participation in leadership, governance and decision-making was pegged at a minimum of 30% by the constitution. This helped increase women's presence in leadership from 20.5% in 2008 to 38.6% in 2012 due to the affirmative action measures. Notably the inclusion of gender mainstreaming in the performance contracting process helped strengthen accountability on gender equality in public service.

8. **Youth:** The youth comprise 36% of the national population but alarmingly 61% of them remain unemployed²¹. About 92% of the unemployed youth lack vocational or professional skills demanded by the job market. Despite their numerical weight, the youth are not well represented in the national and local political and socio-economic development processes. Lack of access to land and dissatisfaction with agricultural production as a livelihood strategy especially among rural males limits their livelihood options. Yet it is the youth who are most energetic, better educated and more technology savvy. Thus, their exclusion represents untapped potential for increased adoption of productivity-enhancing farming technologies.

9. **Environment:** Kenya is committed to the protection of the environment, as is enshrined in the constitution (2010), under Articles 42, 60(c) and 69(a-h), espousing the rights to a clean and healthy environment, sustainable and productive management of land resources, and sustainable use and protection of genetic and biological diversity. Several policy documents have been developed that facilitate environmental protection in Kenya. Among these are the National Environment Policy (2013), National Policy for the Sustainable Development of Northern Kenya and other Arid Lands (2012), Forest Policy (2014), National Land Policy (2009), Biodiversity Regulations (2006) and the National Action Programme to combat desertification (NAP, 2002). Furthermore Kenya is a party to many international treaties, agreements and protocols on biodiversity, ecosystems and the environment, among these, the Convention on Biological Diversity (CBD) in 1994, the UNCCD (1997), UNFCCC (1994), and Ramsar Convention on Wetlands (1992). Institutional reforms since the new Government dispensation starting 2013, saw several ministries merged, but later in 2015, the Water Department was upgraded to a full Ministry, leaving the Ministry of Environment and Natural Resources (MENR), which also holds the Regional Development docket. MENR has under its jurisdiction state corporations which include the Kenya Forest Service (KFS), and the National Environment Management Authority (NEMA), among others.

10. It is important to note that despite water resources being regarded as a national affair, environment, agriculture and forestry have now been devolved from the national government to the respective County governments. Each County has a County executive appointed to coordinate each of these sectors with staff reporting directly to the County government. The action plans, budgets and targets are defined in the County integrated development plans. National ministries maintain their roles with regard to overall policy development, coordination and advisory services.

11. **Forest cover:** At independence in 1963, Kenya's forests covered 10% of the total land area, and by 2003, this had drastically reduced to about 2% forest cover. Over the years, the forest cover in Kenya drastically reduced due to poor protection, forest excision for settlement, wood fuel, legal/illegal logging, cultivation and poor enforcement of laws that have always existed to protect forests²². However, according to that National Forest Policy²³, recent re-afforestation efforts have seen resurgence attaining 6.99% national forest coverage, and approximately 1.24 million hectares of closed canopy indigenous forest contributing to 3.6% of Kenya's GDP. Biomass from forests comprises about 80% of all energy used in the country, while forests also provide a variety of other goods support subsistence livelihoods of many communities. Forests comprise the country's water towers and catchments, where over 75%

²¹ Second Medium Term Plan (2013-2017). The Presidency and Ministry of Devolution and Planning

²² The Forest Act-2005 (repeal of Cap 385). Sessional Paper No. 9. Government of Kenya, Nairobi

²³ National Forest Policy, 2014. Ministry of Environment, Water and Natural Resources

of the country's renewable surface water originate, and therefore, are important for human livelihoods, irrigated agriculture, and hydro-power generation. The five major water catchment or water towers in Kenya are the Mount Kenya, Aberdare ranges, Mau forest, Mt. Elgon and Cherangani hills. Generally, the expansion of agriculture, rapid urbanisation, growing demand for timber and charcoal trade and the destruction of the rich biodiversity by human encroachment threatens these forest ecosystems²⁴. Deforestation in Kenya's water towers deprives the Kenyan economy of 6 billion Shillings annually and threatens the supply of more than 70% of the country's water supply²⁵. Therefore, GoK is committed to the restoration of forest cover and the conservation of the five Kenyan water towers is a priority to MENR. The Vision 2030 proposes to increase forest cover in the country from 2% in 2010 to 10% coverage under a protected area system. This aims at increasing significant amount of forestation area, and also including afforestation of the other degraded areas and isolated smaller forests.

12. Water resources availability and demand: The water resources of Kenya are consistently affected by increasing demand, due to increasing population, industrialisation and changing lifestyles. To this end, Kenya has been described as a water-scarce country²⁶, with rapidly dropping fresh water availability²⁷. In 1992, the per capita water availability was about 647 m³. Due to increasing population, this had dropped to 534 m³ per capita by 2011 and is projected to decline to 235 m³ by 2025²⁸, meaning the country will be severely water stressed. Meanwhile, the demand for water supplies and services continues to grow. The total water demand for domestic, industrial irrigation, livestock, wildlife and inland fisheries will increase from 3,218 million m³/year in 2010 to 21,468 million m³/year in 2030 and growing to 23,141 million m³/year in 2050. Generally, current developed water infrastructure in the country is often inadequate across all services, including for industrial, commercial, domestic as well as for irrigation, livestock and wildlife use. In addition, excessive abstraction of surface and groundwater, cultivation of water catchment areas, thus causing soil erosion, have increased pollution of water sources, by increasing the eutrophication and siltation of lakes, dams and pans and pollution from toxic chemicals, including agricultural pesticides and heavy metals. Thus, the increasing demand for water will continue to intensify competition among users and uses. Meeting the growing demand for water faces major challenges particularly due to rapid urbanisation and changing lifestyles.

13. Land Degradation: Land degradation has many definitions, but in the context of this project, is defined as *"The reduction in the capacity of the land to provide ecosystem goods and services and assure its functions over a period of time for its beneficiaries."*²⁹ Land degradation is increasing in many areas of Kenya in both severity and extent, with over 20% of all cultivated areas, 30% of forests, and 10% of grasslands being subjected to degradation³⁰. The main causes of land degradation include; population pressure requiring to grow more food, leading to opening up more land for cultivation with attendant destruction of natural vegetation as well as other activities such as poor farming practises (failure to use inputs, over-grazing), poorly planned infrastructure developments, and generally unsustainable over-exploitation of natural resources. Unfortunately, the areas which experience the highest degradation risk coincide with the most productive areas in the country. These areas also

²⁴ NEMA (2011). State of the Environment and Outlook Report for Kenya 2010. National Environment Management Authority (NEMA), Nairobi

²⁵ Republic of Kenya, (2012) Report of the high - level national dialogue on Kenya water towers, forests and green economy

²⁶ A country is considered water scarce if the total per capita water availability is less than 1,000 m³. It is water stressed if the values is below 500 m³.

²⁷ Recent discoveries of huge groundwater reserves means that there is need to revise these figures.

²⁸ www.informaworld.com/smpp/content~db=all~content=a917971133

²⁹ FAO 2011. Manual for Local Level Assessment of Land Degradation and Sustainable Land Management. Food and Agriculture Organization of the United Nations. Rome.

³⁰ Muchena, F. N. (2008). "Indicators for Sustainable Land Management in Kenya's Context". GEF Land Degradation Focal Area Indicators, ETC-East Africa. Nairobi, Kenya.

continue to experience increased fragmentation and deforestation due to increasing pressure for new cultivation and grazing lands as well as for settlement.

14. Wetland degradation brings another dimension of land degradation in Kenya, pushed by expansion of agriculture and unsustainable exploitation of wetland resources, and subsequent losses to biodiversity (through harvesting wetland products, including medicinal plants).³¹ Wetlands play a fundamental role by maintaining hydrological stability through regulating stream flows, improving water quality by sediment filtration absorbing heavy metals and other toxic pollutants as well as reducing the risk of flooding downstream. They also help to recharge groundwater aquifers thereby making groundwater easily available and augmenting stream flows, functions which are now threatened as wetlands dry up or are polluted. Combined with rampant degradation of the catchment areas, this is causing the drying up of springs, reduced dry season flows in streams and rivers to the extent that many formerly perennial streams have turned ephemeral or dried up completely. These kinds of hydrological imbalances can be restored through catchment-based planning and action.

15. **Vulnerability to climate change:** There is growing evidence of climate change in Kenya. The frequency of droughts, floods, and other extreme climate events has increased over the last four decades. Since the early 1960s, both minimum and maximum temperatures have been increasing (warming) throughout the country. The minimum temperature has risen generally by 0.7–2.0°C and the maximum by 0.2–1.3°C, depending on the season and the region³². Temperatures are increasing and the six warmest years have all occurred since 1987. Also, the frequency of ‘hot’ days has increased dramatically, by 57 days per year³³, whilst cold nights have declined by 42 days per year. Projections indicate increases of 1-3.5 degrees centigrade by 2050s³⁴. The general warming is leading to reduced glaciers on Mt Kenya and sea level rise along the coast. The National Climate Change Response Strategy (2010) and National Climate Change Action Plan (2013) seek to mainstream an inclusive and equitable low-carbon development pathway for the country in the face of climate change. The Action Plan feeds into Vision 2030’s Second Medium Term Plan (2013 – 2017) and lays a solid foundation for reducing vulnerability to climate change and enhancing climate adaptation in the country. It takes adaptation and mitigation efforts in all key sectors including: livelihood diversification, development of human capital, water resources conservation and development, climate-proofed infrastructural development (roads and energy), afforestation and reforestation, and climate-resilient agricultural systems, among others.

16. **Policy frameworks:** A multiplicity of laws, policies, strategies and institutional frameworks exist in Kenya touching on land, agriculture, water resources, catchment management and infrastructure, in support of national development and human wellbeing. Supreme among these, is the new Constitution³⁵ enacted in 2010 and which became fully operational after the general elections of 2013. The Kenya Vision 2030³⁶, the country’s development blueprint covering the period 2008 to 2030, which aims to transform Kenya into a newly industrializing, “*middle-income country providing a high quality of life to all its citizens in a clean and secure environment by the year 2030*”. The implementation of the vision is undertaken through a series of 5-year medium term plans (MTPs), with the current one being the Second MTP (2013-2017)³⁷, which proposes extensive development programmes for water, agriculture and catchment protection, and based on the Vision’s MTP, MENR’s key

³¹ NEMA (2009). Environmental Management and Coordination Act (EMCA).

³² Government of Kenya, 2010. National Climate Change Response Strategy.

³³ Temperatures in Kenya vary with altitude. Cold temperatures can be as low as 9°C in the highlands, while hot temperatures can exceed 33°C at the Coast

³⁴ GoK2010 State of the Environment Report,

³⁵ The Constitution of Kenya, 2010, Republic of Kenya

³⁶ Government of Kenya (2008). Kenya Vision 2030: A Globally Competitive and Prosperous Kenya. The Government of the Republic of Kenya.

³⁷ Second Medium Term Plan (2013-2017). Ministry of Devolution and Planning. Government of Kenya (2013)

sectoral priorities include the rehabilitation and protection of the Kenyan water towers.³⁸ The second MTP further recognises the need to strengthen private sector involvement in development issues.

17. With regard to **Water Resources**, the Constitution of Kenya (2010) recognises water as a human right and espouses the protection of the environment and natural resources such as forests, game reserves, water catchment areas, including all rivers/springs, lakes and wetlands. It accords that water resources/catchment areas; rivers, lakes, protected areas and other water bodies shall be held in trust for the people by the National Government. The Constitution further assigns responsibility for water supply and sanitation provision to the 47 Counties under the devolved system of government³⁹. The new devolved system of government elected in March 2013 has wide-ranging implications for water resources management and catchment protection, including on the upstream-downstream water sharing responsibilities and mandates.

18. Meanwhile, a raft of laws, Bills, Policies, Strategies institutional and regulatory structures are currently being developed, while existing ones are being revised/reviewed to be in line with the new Constitution (2010), the Kenya Vision 2030, and other emerging policy changes. In this regard, the Water Act 2002 is currently under review, with the process having passed the first reading in Parliament as the Draft Water Bill⁴⁰. Although still in progress, key policy issues to guide the water sector are emerging. Most of the regulations in Water Act 2002 have been retained. For instance, the right to clean and safe water is reinstated in as stipulated in Article 43 of the Constitution of Kenya, also retaining ownership of water resources by the National Government. The bill further espouses the administrative and regulatory structures to support water resources management, including retaining the roles of Water Resources Users Associations (WRUAs) and geographic mandates as per water catchment areas (rather than Counties) as the basic planning unit.

19. With regard to **Agriculture**, the three main ministries at national level were merged in 2013 into the Ministry of Agriculture, Livestock and Fisheries (MoALF) with three State Departments each headed by a Principal Secretary reporting to one Cabinet Secretary. The regulatory framework governing Kenya's agriculture is also undergoing significant legislative reforms following the coming into force of newly enacted laws - the Agriculture, Fisheries, and Food Authority (AFFA) Act 2013, the Crops Act (2013), and the Agricultural and Livestock Research Act (2013) among others. These new laws are expected to transform Kenya's agricultural sector into a commercially oriented and internationally competitive industry. They unified the 131 laws that have governed agriculture in the past and, once implemented, will merge the 24 state corporations associated with agriculture into a single regulating entity (the Agriculture, Fisheries and Food Authority – AFFA). Already, KARI has undergone structural reforms, creating the Kenya Agricultural and Livestock Research Organization (KALRO) with six theme-based research institutes (<http://www.kalro.org>). Under the new regulatory framework, AFFA will now oversee operations of Kenya's agricultural sector, which includes: licensing and law enforcement; farmer registration to enable the country to better provide services such as training and extension; a checks and balances system to allow Kenya meet international standards and agreements; and policy guidelines on agricultural issues that local entities must implement in order to ensure that national standards and policies remain consistent country-wide. At the devolved level, the powers of the county include (a) crop and animal husbandry, (b) livestock sale yards, (c) county abattoirs, (d) plant and animal disease control, and (e) fisheries.

20. With regard to **Catchment Protection**, an important legal instrument for the protection of Kenya's environment and biodiversity is guided by the Environmental Management and

³⁸ MENR (2014). Project Concept Notes. Nairobi, Kenya (discussion paper for development partners)

³⁹ Devolution in Kenya: Opportunities and Challenges for the Water Sector. Water and Sanitation Program: Policy Note, September 2013

⁴⁰ Republic of Kenya 2014. Water Bill 2014 (released by Parliament).

Coordination Act⁴¹. EMCA contains several provisions that could be used to promote the conservation of forests and biodiversity, including conservation easements, restoration orders, and environmental impact assessment. On protection and conservation of the environment, EMCA has regulations covers the protection of forests, rivers, lakes, wetlands, traditional interests, hill tops and hill sides, mountain areas and forests. It also covers the reforestation and afforestation of hill tops, hill slopes and mountainous areas and planting of trees or woodlots. Further, the Act covers the conservation of biological diversity (in suit and ex-situ) and energy conservation. Among other things, the National Environment Management Authority (NEMA) has developed national guidelines to encourage the identification and designation of environmental easement areas (ESAs), including biodiversity. Potential ESAs therefore include areas which contain the variety and variability among all living organisms from all sources, and the ecological complexes of which they are a part and the diversity within and among species, and ecosystems: areas which contain significant, rare or endangered plant or animal species. The Water Resources Management Authority (WRMA) is in charge of developing and implementing Catchment Management Strategies (CMS) for the six water catchments in Kenya. A CMS is the framework for the management of the water- and related land resources in the catchment and it outlines how the concept of Integrated Water Resources Management can be implemented at the catchment level. For the whole of the Tana catchment area, the current CMS covers 2014-22, a recent update requested by Kenya's Vision 2030.

21. For the Water Fund pilot modelling⁴², local NGOs and WRUAs were involved, as well as WRMA, to allow for the integration of different planning and strategy levels into (sub-) catchment planning. And as the County Development Plans are only taking shape at the moment, there is good opportunity for UTNWF so as to ensure WRUA and (sub-) catchment management plans are properly incorporated into a coordinated landscape approach.

B. Rationale

22. The GEF Integrated Approach Programme (IAP) on Fostering Sustainability and Resilience for Food Security in Sub-Saharan Africa is one of three integrated approaches that were agreed as part of the sixth replenishment of the GEF. The Food Security Integrated Approach Programme (FSIAP) will target agro-ecological systems where the need to enhance food security is directly linked to opportunities for generating global environmental benefits. The programme aims to promote the sustainable management and resilience of ecosystems and their different services (land, water, biodiversity, forests) as a means to address food insecurity. At the same time, it will safeguard the long-term productive potential of critical food systems in response to changing human needs. The FSIAP will be firmly anchored in local, national and regional policy frameworks and strategies that will enable more sustainable and more resilient production systems and approaches to be scaled up across the targeted geographies (For UTNWF these are summarised in Attachment 4.2). The UTNWF project represents one of the 12 national projects under the joint IAP umbrella programme.

23. Being an integral part of the 12 country regional programme, UTNWF will contribute to the collective impact of this programme, which is intended to inform approaches to food security in the drylands of sub-Saharan Africa towards win-win solutions between food production and maintaining ecosystem services and in face of anticipated climate shocks. Each country project has committed to participating in the peer-peer applied management opportunities which are an integral part and distinct feature of this programme, and which will be cost-shared with the cross-cutting coordination and applied knowledge management and capacity development "hub" project. Countries will both participate in and host site visits and

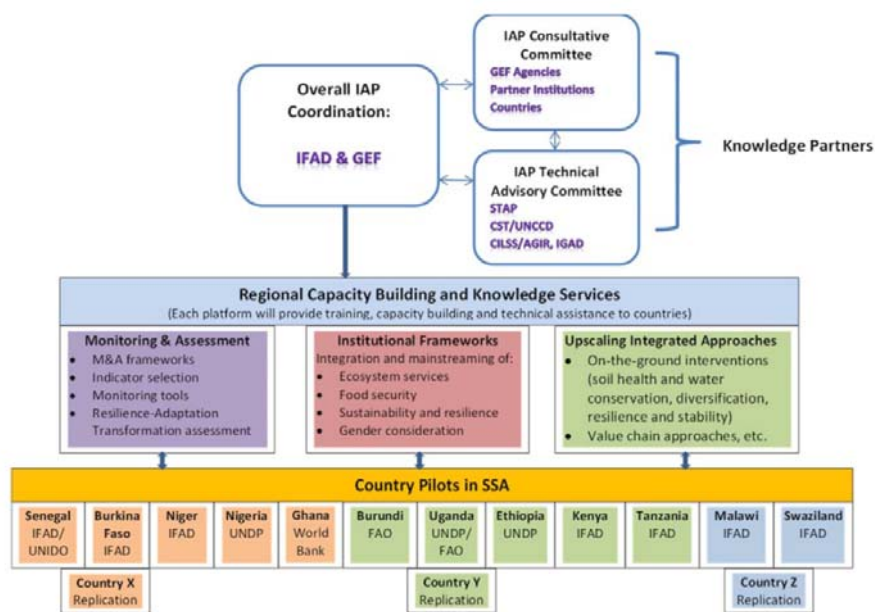
⁴¹ The Environmental Management and Co-ordination Act (EMCA No.8 of 1999), Government of Kenya

⁴² Upper Tana-Nairobi Water Fund Business Case. TNC, 2015.

in communities of practice on specific themes of interest and value to multiple IAP countries and which will be defined during the project.

24. In turn UTNWF will benefit from participation in this programme by accessing through the activities delivered by the hub project good practice from the target geography and beyond through peer learning, current thinking on food security policy as well as access to technical expertise on a cost sharing basis where there is interest from multiple project countries. The programme will generate knowledge management products and have an advocacy function which draws upon and creates visibility for the anticipated success stories from the country projects at the level of sub-regional and regional bodies within the context of food security debates and policy making. This programme is coordinated by multiple GEF Agencies with IFAD as the lead agency. The programme will be coordinated via a substantive cross-cutting “hub” project worth \$10.4m and with a full time task manager.

Figure 1: FSIAP organigramme



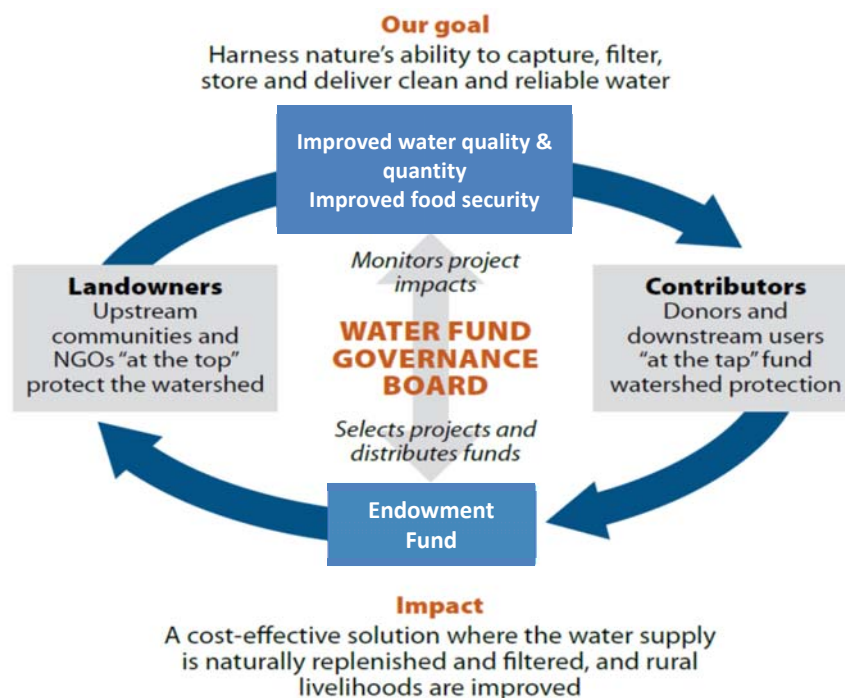
25. Forests and wetlands in the Upper Tana play an important role in maintaining water quality and quantity, providing areas where runoff water and sediment can be stored and filtered naturally. However, since the 1970s, forests on steep hillsides and areas of wetlands were converted to agriculture. As a result, sedimentation is becoming a serious problem, reducing the capacity of reservoirs and increasing the costs for water treatment. Today, 60% of Nairobi’s residents are water insecure. The challenges to water security will likely grow as climate change brings increasingly unpredictable rainfall, equally challenging the resilience and food security of upstream smallholder farmers.

26. Investments in green infrastructure using natural systems to trap sediment and regulate water often provide a more cost-effective approach than relying solely on grey infrastructure such as reservoirs and treatment systems. Water funds have been successfully implemented elsewhere in the world to help secure the water quality and supply of major cities including New York, Quito, Rio de Janeiro, and Lima, among others. The Upper Tana-Nairobi Water Fund will be the first of its kind in Africa, and will be an example of south-south transfer utilising lessons TNC have learned in the development of Water Funds in Latin America, including in Quito, Rio de Janeiro, and Lima, among others. The UTNWF as a public-private-partnership of donors and major water consumers ‘at the tap’ contributes to the endowment to support water and soil conservation measures ‘at the top’. These measures benefit local farmers

through increasing agricultural yields, food security and incomes by reducing soil erosion that is so damaging both to crop production and to downstream water quality and supply.

27. The Project will work with public and private sector partners to establish the Water Fund as a sustainable financing mechanism to support sustainable land management and integrated natural resource management approaches in the Upper Tana catchment. Through its network of public agencies, NGO and CBO, the Project will support smallholder farmers in the Upper Tana catchment to adopt climate-smart sustainable land management practices, with the aim to increase food security and climate adaptation potential at household level, to stabilise and restore ecosystem services of the targeted area, to conserve and protect the catchments' ecological integrity and to improve water quality and quantity for both upstream and downstream water users.

Figure 2: The Water Fund Concept



C. Theory of Change

28. The above project rationale can also be visualised as a development pathway (Figure 3). The conservation and protection of the Upper Tana catchment, among the Kenya Vision 2030 priorities, is a process of change advanced by two main drivers: a) the establishment of the Water Fund as a public-private partnership to provide resources and payment for ecosystem services that promote catchment protection and sustainable agriculture tools, techniques and incentives, and b) the application and integration of environmental and socio-economic monitoring tools into policy processes, aiming at landscape approaches and integrated planning for environmental management and human well-being.

29. The outcomes are supported by several intervention clusters, assumptions and key interactions underpinning the transformational changes aimed at. Improving rural livelihoods through food security and improved resilience to climate change are the main developmental pathways of change, strongly supported by the promotion of integrated land, water and agricultural management, creating multiple global environmental benefits: reduced erosion

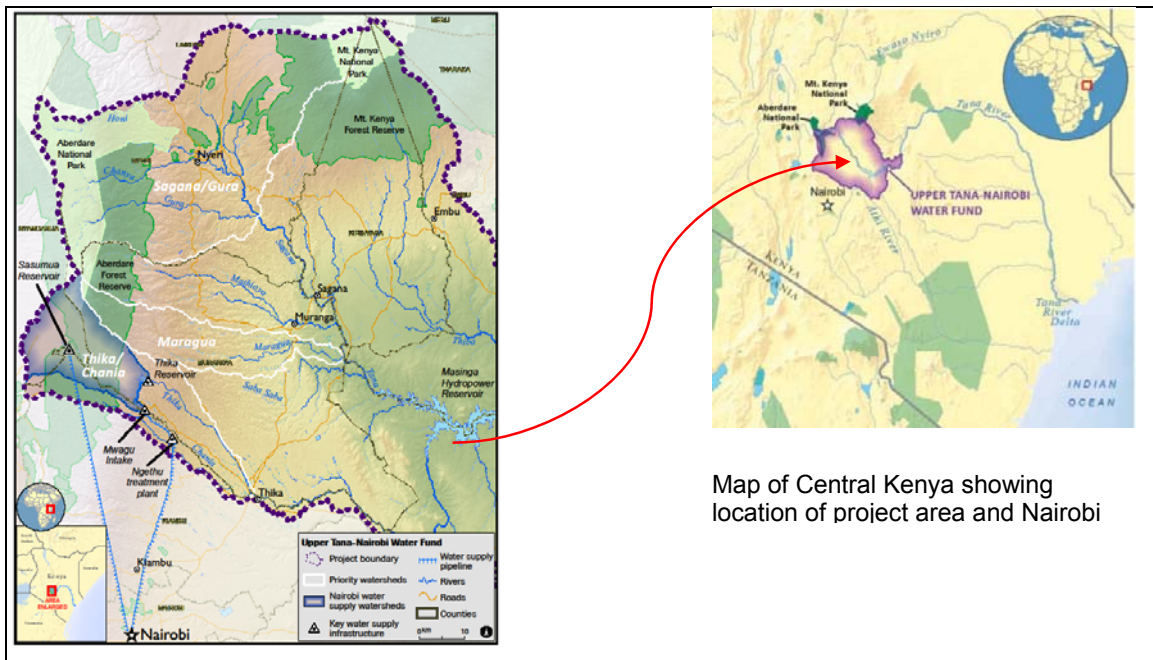
potential, improved ecosystem services such as water quality and quantity, increased biodiversity protection in production landscapes, strengthened agro-forestry leading to avoided GHG emissions, among others.

Project description

A. Project area and target group

30. The Upper Tana-Nairobi Water Fund (UTNWF) project area cuts across two basins; (i) the Tana River basin, whose upstream catchments host the project beneficiaries, thus constituting the main project area, and (ii) the Athi River basin, wherein the city of Nairobi is located. The main project activities that target the poor will be in the Upper Tana Catchment, hence that is the focus of the project area description and target groups. Geographically, the Upper Tana basin is usually described as all areas draining up to Masinga dam⁴³. But for purposes of the UTNWF, the project area includes the Upper Tana River tributaries that contribute flows to the City of Nairobi and its environs. This includes both the existing water works (e.g. Sasumua, Ndakaini dams) and planned water development projects (e.g. the Northern Collector Pipe⁴⁴) located in the Tana upper catchments. This area traverses across three counties of Muranga, Nyeri and Nyandarua, covering an area of 17,000 km² and hydrologically delineated as three major sub-catchments, the Sagana-Gura, Maragua, and Thika Chania (Figure 4). As the Tana drains from two of Kenya's five water towers: the Aberdare Range and Mount Kenya, this project is targeted in an area bearing national significance, and the rehabilitation and protection of Kenya's water towers figures prominently among MENR's key sectoral priorities.

Figure 4: The project area in the Upper Tana Basin of Kenya, also showing Nairobi City (which lies outside the basin)



31. The Upper Tana catchments are of critical importance, being the origins of the main Tana river which is the biggest and longest river in the country, traversing 1,012 km from its

⁴³ Soil and Terrain database for Upper Tana, Kenya. Green water Credits Report 11. World Soil Resources, ISRC, 2010.

⁴⁴ Nairobi Northern Collector Extension of Nairobi drinking water system.

<http://www.afd.fr/webdav/shared/PORTAILS/PAYS/KENYA/Nairobi%20Northern%20Collector%20VO.pdf>

source on both the Nyandarua Range (3,990 m) and the Mt. Kenya (5,199 m above sea level) to the Indian Ocean near Kipini. The full Tana River basin covers an area of 126,418 km², which is about 21.9% of the land area of Kenya. The average annual flows in the Tana river is about 5,000 Mm³, with two flood seasons each year, but varies substantially both within and across years. The Tana supplies about 32% total national water resources of Kenya, with Mt. Kenya and the Aberdares Range respectively providing some 49% and 44% of the total water flows in the Tana. The upper reaches of the Tana River drain into the five major reservoirs for hydropower generation, namely, Masinga, Kamburu, Gitaru, Kindaruma, Kiambere, with total installed capacity of 567 MW. These dams play an important role, supplying about 80% of national hydropower, with a generation potential estimated at 960 MW. Upstream of the Masinga reservoir, are multiple small hydropower facilities, including the Tana power station (20 MW), Sagana power station (1.5 MW), Ndula power station (2.0 MW), Mesco power station (0.5 MW), and Wanji power station (7.4 MW). While their contribution to energy production along the Tana River is modest, sedimentation at the dams for these power stations may also be an issue. Furthermore, a list of 96 additional installations on the Tana River, mostly dams, was proposed in a recent study⁴⁵. Their construction, however, could significantly alter the hydrologic regime of the Upper Tana as well as the sediment loads, thus affecting the economy of the whole country.

32. Livelihoods and ecosystems at risk: Agriculture is the predominant economic activity in the project area. The main crops are: banana, potato, cotton, beans and maize. In the footslopes of Mt. Kenya, the catchment is heavily cultivated and settled, where tea and coffee are widely grown and dairying is another income earner; the area is also providing most of the horticultural produce consumed in Nairobi and other major towns. Yet the Upper Tana catchment is home to critical indigenous flora and fauna and sustains important aquatic biodiversity and hydrological balances. The rich and unique plant and animal diversity in the Mt. Kenya and the Aberdares ecosystems make these hotspots for conservation. Species include 25 large mammals, 479 plant genera, including 81 regionally endemic and 11 nationally endemic species, 53 out of Kenya's 67 African highlands biome bird species, various reptiles and amphibians and a total of 4282 currently documented invertebrates.⁴⁶ Although the water towers lie largely within protected areas, these are threatened by pollution and degradation of the environment from intensive agriculture as population pressure mounts. Millions of people and the iconic wildlife that depend on the river bear the brunt of these impacts. This is amplified by the impacts of climate change that increases sediment load in times of severe rainfall events which are of increased frequency.

33. Nairobi City depends on Project Area for water: The Upper Tana catchments supply the bulk of the water used in Nairobi City through the Sasumua and Ndakaini dams drawing water from the Chania and Thika rivers respectively. Nairobi being a major industrial hub in Kenya, this includes both industrial and household consumption. Suffering a huge deficit, the water demand in Nairobi City is 750,000m³/day against water sources capacity of 525,000m³/day⁴⁷. However, increasing suspended sediment in the river has become a major issue as it affects the quality of drinking water and increases maintenance and water treatment costs. NCWSC reports that water treatment costs often increase by more than 33% as sediment runoff fills and disrupts treatment equipment during the wet season, causing supply interruptions. Without intervention, this problem will likely increase, as climate change causes more intense rainfall events and population growth leads to more farming on steep slopes. In addition, Nairobi's water treatment and distribution facilities are already under pressure. The current water deficit for the city stands at 168,000 m³ per day (or 30% of demand) when the system is operating at full capacity. Nairobi has a strategic objective to enhance the water sources capacity to meet the demand of 782,000m³/day by December 2016. However, these

⁴⁵ WRMA (2011), Physiographical Baseline Survey for the Upper Tana Catchment Area, Nairobi, Kenya.

⁴⁶ NMK (2014), Assessment of Status of Ecosystems along Tana River Basin, Nairobi, Kenya.

⁴⁷ Financing Water Projects for Sustainable Infrastructure. Presentation by P. Gichuki (20th July 2015).
<http://www.isk.or.ke/userfiles/ISK%20Presentation.pdf>

efforts will be difficult to achieve without the support of the communities where the water originates from.

34. Impacts of sedimentation on water supplies - Since the 1970s, large areas of forests in the Upper Tana have been replaced by agricultural fields. Demand for irrigation water has increased, particularly to support horticulture production. Encroachment on natural wetlands that once stored runoff water and recharged aquifers has reduced dry-season flows. Agricultural expansion along with soil erosion and landslides has increased sediments in local rivers. The combination of these factors means that in the Tana River there are lower water yields during dry periods and increased sediment in streams. The Masinga reservoir, for example, was designed on the basis of a siltation rate of 3 million tons per year. However, by 2010, the siltation rate was 6.7 million tons per year (two times higher). The Masinga reservoir has already lost an estimated 158 million m³ of storage volume⁴⁸. Reservoirs lose active storage capacity as they fill with sediment, limiting the ability of hydropower producers to balance production across seasons. Declining water yields translate into decreased production, particularly when they occur during the dry season. During the 2009 drought, KenGen's electricity sales dropped 12% compared to the previous year, a decline of US\$19.8 million⁴⁹. Therefore, the Tana River, has not been receiving adequate catchment protection. Local residents who farm the upper watershed receive no outside investment or incentives to protect this critical resource or to implement measures to reduce soil erosion. The river is being choked by sediments, and dry-season flows are being depleted due to poor land and water management practices.

35. Target Groups: The UTNWF project aims at working with at least 21,000 smallholder households in the three sub-catchments, i.e. about 100,000 individuals as direct beneficiaries, with cascade effects on the total population of 5.3 million inhabitants in the Upper Tana catchment. The Project will work with public and private sector partners to establish the Water Fund as a sustainable financing mechanism to support sustainable land management and integrated natural resource management approaches in the Upper Tana catchment. Through its network of public agencies, NGO and CBO, the Project will support smallholder farmers in the Upper Tana catchment to adopt climate-smart sustainable land management practices, with the aim to increase food security and climate adaptation potential at household level, to stabilize and restore ecosystem services of the targeted area and to improve water quality and quantity for both upstream and downstream water users. As women and youth form the majority of vulnerable groups in terms of poverty and/or food insecurity, particular attention will be given to reach these, e.g. through targeted incentives (such as improved stoves, biogas, employment and alternative livelihood opportunities) and through improving decision making opportunities in local institutional processes, e.g. in WRUAs or catchment committees, aiming for improved access to land and water.

36. Major water users as project partners and indirect beneficiaries: There are many water users in the Upper Tana with the main ones being: Nairobi Water and Sewerage Company (NWSC), Kenya Electricity Generating company (KenGen), National Irrigation Board, and large scale firms such as Del monte, several flower farms and various other water service providers. Within the city of Nairobi, manufacturing companies like East Africa Breweries, Coca Cola, Unilever and other industries are huge commercial consumers of water. The leading four users account for approximately 75% of the ground water abstraction in the basin. KenGen is responsible for power generation and presently running the power generation works in five dams located along the Tana River. The Nairobi Water and Sewerage Company manages the water sanitation services for the capital city of Kenya. These will form some of the main private sector and public utility partners to the project, increasingly realising that they have to play a major role in supporting the maintenance and protection of the

⁴⁸ WRMA (2011), Physiographical Baseline Survey for the Upper Tana Catchment Area, Nairobi, Kenya

⁴⁹ KenGen (2010). Annual report and financial statement.

resource their business depends upon.⁵⁰ The city of Nairobi alone has a population of 4 million people, thus underpinning the competition and importance of the Tana River in the national economy. As the UTNWF's interventions aim at improving water quantity and quality in the Upper Tana catchment area, and Nairobi City water needs are supplied by 95% from this area⁵¹, the Nairobi water users, private sector companies and the city's 4 million inhabitants alike, can at least be seen as indirect beneficiaries of the project's services.

B. Development objective and impact indicators

37. The goal of the Project is that *the Upper Tana-Nairobi Water Fund as a Public-Private-Partnership increases investment flows for sustainable land management and integrated natural resource management in the Upper Tana catchment*. As such, UTNWF will contribute to the overall objective of the GEF FSIAP, i.e. to support countries in target geographies for integrating priorities to safeguard and maintain ecosystem services into investments improving smallholder agriculture and food value chains.

38. In line with the GEF-approved PIF, the **Development Objective** for the UTNWF project is formulated as: *A well-conserved Upper Tana River basin with improved water quality and quantity for downstream users (public and private); maintaining regular flows of water throughout the year; enhancing ecosystem services, specifically for food security, freshwater and terrestrial biodiversity, and improving human well-being and quality of life for upstream local communities*.

39. The impact against the goal and project development objective can be gauged by measuring progress against a number of indicators, summarised from the logical framework in Table 1 below. The exact magnitude of these targets will be refined upon the collection of baseline information. Whenever applicable, the indicators will be disaggregated by gender and age.

Table 1: Overview of UTNWF impact indicators ⁵²

Impact indicator	Target
Number of smallholder farmer households with improved food-security, climate change adaptation and resilience capabilities	21,000 households
Number of smallholder farmer households adopting climate-smart SLM practices	21,000 households
Number of hectares on which SLM practices are implemented	100,000 ha
Number of hectares influenced to adopt SLM practices	663,000 ha
GHG emissions avoided and/or sequestered	10% increase over baseline through LUC

C. Outcomes/Components

40. To achieve its development objective, the UTNWF project is structured along three closely interlinked components with their respective outcomes:

Component 1: Water Fund Management Platform institutionalised

- Outcome 1.1: Multi-stakeholder and multi-scale platform supports policy development, institutional reform and upscaling of INRM
- Outcome 1.2: Policies and incentives support climate-smart smallholder agriculture and food value chains in financially viable and sustainable watershed stewardships

⁵⁰ See also TNC (2015). Upper Tana-Nairobi Water Fund Business Case. Nairobi. Kenya

⁵¹ NCWSC production records, 2014.

⁵² For further detail on local and global environmental benefits and impacts, please also consult Attachment 6.1.

Component 2: Improved Upper Tana catchment ecosystems that support livelihoods, food security and economic development

- Outcome 2.1: Increased land area, freshwater, and agro-ecosystems under INRM and SLM

Component 3: Robust knowledge management and learning systems implemented to direct UTNWF management and share lessons both nationally and regionally

- Outcome 3.1: Institutions capacitated to monitor GEBs
- Outcome 3.2: M&A framework supports the integration of climate resilience into policy making
- Outcome 3.3: Knowledge management and sharing of lessons learned is facilitated

Component Description

Component 1: Water Fund Management Platform institutionalised.

41. The project will work closely with private and public partner organisations to establish the Water Fund (WF) as a Charitable Trust registered under Kenyan law and governed by a Board of Trustees. The Board of Trustees will manage the overall operations of the WF, which will have a set of advisory committees at both national and at county levels and a Technical Secretariat, responsible for the day-to-day management of its activities. Through this integrated approach, the WF will also provide support to and input for coordinated strategies and policies at both county and national levels with regard to watershed and catchment management at appropriate scale.

42. Upon legal registration of the WF, the financial management system will be established, in accordance with Kenyan law and compliant with international fiduciary standards, to allow for the capitalisation of the endowment through funds from its public, private and international partners. In its establishment, the WF's sustainable finance mechanism will be supplied by a hybrid fund, i.e. a combination of an endowment fund with contributions by international donors (e.g. the GEF) and contributions by the private sector entities engaged in the WF; it is envisaged to further leverage additional ODA funding throughout the UTNWF project life time. The WF's finance mechanism will equally include a periodic replenishment through fees and further contributions by public, private and international donors. The Nairobi City Water and Sewerage Company (NCWSC), in anticipation of the WF becoming a legal entity, e.g. already explored opportunities, and a levy on water prices specifically for conservation purposes was agreed by the GoK and gazetted on 2nd October 2015.

43. Clear indicators for payments for ecosystem services, including the targeting and prioritisation of initiatives and stakeholders in the Upper Tana catchment, will be developed, equally based on in-depth assessments of stakeholder needs and expectations. The success of the WF will, among others, be measured against its ability to disburse funds, to provide incentives for catchment management and to improve downstream water quality and quantity, so as to provide financially viable and sustainable solutions that respond to the needs and expectations of private sector investors in the WF. The extent to which the WF will be responsive to the upstream smallholder target groups' expectations and needs will also be an important indicator, taking into account the different roles and responsibilities in smallholder agriculture. Transparent criteria for different reward schemes and payment for ecosystem services mechanisms, such as direct incentives (tree seedlings or support for village nurseries), financial subsidies (e.g. materials and support for terracing), non-financial incentives (e.g. capacity development, or support to village institutions), or payments for ecosystem services (e.g. subsidised biogas plants for good riparian management), will have to be detailed by the advisory bodies of the WF upon its establishment, to render the WF disbursements as predictable and measurable as possible, including for how to ensure that these target and reach women, youth and the most vulnerable among the upstream target groups. Another indicator will be to what extent the actions and PES schemes employed by

the WF will find traction in national and county-level policies and strategies, and how lessons learned can be scaled out to other water towers in Kenya and beyond (close linkage with component 3). Here, emphasis will be placed upon collaboration and exchange with existing policy and implementation bodies instead of creating new entities, to also facilitate the uptake of lessons learned into local and national catchment management practice.

Component 2: Improved Upper Tana catchment ecosystems that support livelihoods, food security and economic development.

44. Sustainable land management (SLM) is the internationally used term for the management of natural resources – rangelands, forests and wetlands – as well as agricultural production systems, including climate-smart agriculture (CSA) which embraces conservation agriculture (CA), and climate resilient smallholder farms. However, in the Kenyan context the terms sustainable land management is often used simultaneously and associated with integrated natural resource management (INRM).

45. The aim of the increased investment flows for SLM and INRM to the catchment area, by the UTNWF project - and during project life-time increasingly by the WF itself to sustain these investments - is to foster adaptation and to increase the resilience of the local population through increased food production, food security, household incomes and diversified development options and livelihoods, with due reference and disaggregation of support and results by gender, age and wealth categories.

46. Financial, in-kind, technical and capacity development support will be provided by the project to SLM initiatives based on a modelling approach that employs a set of core indicators such as biophysical effectiveness, feasibility, stakeholder preferences, or cost-effectiveness per activity. The Nature Conservancy, together with CBOs and NGOs, e.g. local Water Resources User Associations (WRUAs) or the Green Belt Movement, over the last three years successfully promoted pilot SLM interventions in the Upper Tana catchment based on the above-mentioned modelling, and a baseline of priority locations and most promising SLM activity areas in the upper Tana catchment was established, together with farmers to ensure their buy-in and acceptance. Pilot initiatives particularly focused on areas such as vegetation buffer zones along river banks, agroforestry, terracing of steep and very steep farmlands, grass buffer strips in farmlands, reforestation of degraded lands at forest edges, and erosion mitigation from dirt roads.

47. This baseline will be combined with Land Degradation Surveillance Frameworks (LDSF), i.e. landscape-level assessments of ecosystem health, including soil condition, vegetation condition/ trends and diversity, land degradation status and carbon assessments, providing UTNWF and the county and national governments with a baseline setting and monitoring tool kit that can be institutionalised and scaled up to other locations (for further discussion on the LDSF, see component 3). These will be complemented with stakeholder needs and expectation assessments to allow for an adaptive portfolio of best suited SLM activities to be employed. An initial carbon assessment for UTNWF was undertaken during project design and estimates avoided carbon emissions of over 1.6 million tons (see Appendix 11 for the detailed GHG assessment).

48. To promote diversified and climate-resilient agricultural production systems that increase food security and incomes at household level, UTNWF will invest, among others, in water harvesting equipment, e.g. establishing rainwater harvesting pans, and water conservation measures such as drip irrigation systems. Their application will be furthered through training and capacity development provided to communal water committees. Further activities for improved soil retention capacities to improve agricultural yields will include terracing and grass strips on agroforestry lands with >12 % slopes and > 15 m from streams. Reducing GHG emissions and increasing carbon sequestration potential in the project area is a cross-cutting aim and co-benefit of activities to be carried out e.g. as part of SLM, riparian management, or by providing training and capacity development for nursery management and

diversified plant production, improved agro-forestry management through (fruit) tree planting campaigns and provision of planting materials. A carbon audit and GHG assessment provides the baseline measurements to determine the achieved changes in land use and in carbon sequestration capacities (see Appendix 11).

49. Riparian zone management was determined as one of the promising activity clusters for a high return on investment in the baseline model. Current agricultural practices alongside creeks are not compliant with Kenyan law that prescribes a buffer corridor of 25 m. While it is difficult to directly indemnify farmers for a return to lawful practices, good riparian management could be incentivised, following experiences already tested in UTaNRMP activities. To reduce stressors on biological resources and to further contribute to avoided GHG emissions, the project will e.g. support good riparian management practices with subsidising the establishment of biogas units at homestead level. The aim is for an initial 100 units during project lifetime; should demand be higher, a scale up could be provided through the PES schemes of the WF itself. Another set of activities will focus on the mapping of freshwater wetlands; the production of a wetlands biodiversity atlas, and an assessment of freshwater biological resources with an emphasis on those with food and feed potential.

50. Road construction and quarry management is another area with high erosion mitigation potential. Many stone quarries are located along river banks; traditional practice includes clearing the vegetation cover and pushing the top soil downhill for easy extraction, increasing immediate sediment runoff and siltation of rivers. Implementing new ways of managing top soil to avoid erosion, coupled with re-vegetation of road shoulders and pits will ensue that these sites remain healthy even after construction or stone extraction is completed, hence reducing both environmental and social impacts. Best practices will be demonstrated, and quarry management committees will be established in sub-watersheds to further discuss and scaled out these best practices. UTNWF equally aims at providing erosion mitigation activities for unpaved rural road shoulders and to provide input and lessons learned to county level road construction manuals and guidelines for improved and more sustainable management practices.

51. Overall, the combination of biophysical and climate-smart agricultural techniques and support for water management are expected to lead to diversified production and increased yield through improved soil retention; improved adaptation potential and resilience through reduced erosion potential upstream, as well as at least stabilised catchment ecosystem services. Downstream economic benefits will include reduced water treatment costs through reduced sediment concentration and increased hydropower generation through higher water yield and reduced sedimentation. The establishment and application of M&A and knowledge management tools (component 3) will also provide the opportunity to detail environmental and socio-economic benefits through project impacts e.g. on water availability and quality, land and soil conditions, or land productivity.⁵³

52. For all these intervention clusters, direct links will be established with the KCEP-CRAL and UTaNRMP project implementation teams along with their partner and smallholder beneficiary networks to exchange lessons learned and to jointly promote emerging best practices across the Upper Tana catchment area.

Table 2: Linkages of UTNWF, UTaNRMP and KCEP-CRAL

	UTNWF component 1: Water Fund establishment	UTNWF component 2: Ecosystem Services support livelihoods	UTNWF component 3: Knowledge management and M&E	UTNWF Project Management

⁵³ Further detail is provided in Attachment 6.1, and can also be found in the Upper Tana-Nairobi Water Fund Business Case (TNC, 2015).

UTANRMP component 1: improved community-based water resources management	PES for SLM and INRM	Rainwater harvesting Riparian management	Lessons in SLM and INRM Lessons learned Baseline data	
UTANRMP component 2: Reversed land degradation process	PES for SLM and INRM	Erosion control Irrigation works	Lessons in SLM and INRM LDSFs Lessons learned Baseline data	
UTANRMP component 3: Increase in household incomes	PES for SLM and INRM	Increased food production Increased resilience	Lessons in SLM and INRM Lessons learned	
UTANRMP component 4: Project coordination and monitoring			Land degradation monitoring	National SLM capacity
KCEP-CRAL component 1: Sustainable increase in production and improved climate change resilience with sustainable SLM	PES for SLM and INRM	Increased food production Food value chains Increased resilience	Lessons in SLM and INRM LDSFs GIS mapping capacities	Local capacity development and local planning
KCEP-CRAL component 2: Improved post-harvest management and market linkages for smallholders	PES for SLM and INRM	Improved food security Food value chains Improved adaptation capacities		
KCEP-CRAL component 3: Improved access to financial services	PES for SLM and INRM Strengthened food value chains			

53. In addition to IFAD- and GEF-supported interventions, there is a broad array of projects and programmes that are either implemented in the Upper Tana catchment or have closely linked objectives and implementation aims. Among these projects, which carry a wealth of experiences and lessons to be learned or to which the UTNWF project can contribute, are:

- Kenya Agricultural Productivity and Sustainable Land Management Project (KAPSLMP) of the World Bank, with GEF support (GEF ID# 2355);
- Soil protection and food security Programme (BMZ/GIZ);
- Food security and resilience Programme (BMZ/GIZ);
- Innovative approaches towards the rehabilitation of water towers in Kenya (GoK);
- Enhancing conservation of catchment areas through payment for water services in the Aberdares ecosystem (GoK);

- The Green Schools Programme (GoK);
- Improving tree seed/seedling production and management towards achieving 10% tree cover in Kenya (GoK);
- Crafting a green future - promoting bamboo micro-industries in five major water towers;
- Facilitated knowledge sharing and livelihoods transformation for climate change adaptation in Kenya (GoK);
- MITI PESA (Promoting Enterprise through Sustainable Afforestation, GoK).

Component 3: Robust knowledge management and learning systems implemented to direct UTNWF management and share lessons both nationally and regionally.

54. UTNWF monitoring and evaluation (M&E) will receive a strong emphasis on knowledge management, monitoring and assessment (M&A) to capacitate partners to assess the state and trends of ecosystem services, climate resilience and adaptation capabilities. Additional importance will be placed to facilitate upscaling and replication of lessons learned as quickly as feasible. Local, county and national institutions will be enabled to measure local and global environmental benefits, and to integrate novel concepts, such as climate resilience, into their respective strategies and policies.

55. UTNWF's M&A framework will therefore establish close linkages with the National Integrated Monitoring and Evaluation System (NIMES), also charged with tracking the MTP implementation for the Kenya Vision 2030, in consulting with the Ministerial Monitoring and Evaluation Committees (MMECs), and the County Monitoring and Evaluation Committees (COMECs). These institutions are considered as active partners in incorporating key data and assessment experiences from the UTNWF M&A framework into their monitoring processes and protocols for mainstreaming and scaling up of integrated catchment and landscape conservation approaches. Close cooperation with and across county level government entities aims at establishing county-collaboration, including similar governance structures across the catchment where appropriate. The involvement of county agencies in project implementation and training on M&E aims at the integration of tools and approaches that support INRM and landscape approaches. UTNWF's M&A framework will further provide for the full WF baseline and its tools be carried forward by the WF itself, hence ensuring sustainability within the WF as well as with its Kenyan partner organisations at local, county and federal levels.

56. Comprehensive assessment tools, such as the Land Degradation Surveillance Framework (LDSF) will be applied in 5 sub-watersheds, in close collaboration with CIAT and ICRAF. The results and modelling approaches will be integrated into partner organisations' monitoring procedures. Existing simple hydrometric gauging stations will be upgraded with automated loggers and their numbers increased to improve data availability of water quality and quantity, and the new data sets will be integrated into the existing water database at WRMA.

57. IFAD's Multidimensional Poverty Assessment Tool (MPAT) will be integrated into the Project's M&E framework as well as into the institutional structure and processes of the WF to allow for the M&A of socio-economic parameters, including for gender disaggregated livelihoods. To account for an appropriate gender analysis and inclusion of climate change resilience and adaptation strategies, the MPAT tool kit will be expanded with the Women's Empowerment in Agriculture Index (WEAI), and tools and concepts from the STAP's Resilience, Adaptation Pathways and Transformation Assessment Framework (RAPTA).

58. The Project aims at establishing an information centre at the national level in close collaboration with the National Museums of Kenya, including a standing exhibition on the concept of water funds and its application in the Upper Tana, so as to disseminate and share its results and lessons to be learned. Another information centre at county level will provide learning materials and information tools appropriate to the subsidiary level of sub-catchments. Furthermore, to allow for the water fund concept to take hold in the public arena, a school

awareness programme will be developed and linked to the ongoing Green School Programme. Taking into account the need to increase traction at the other end of the spectrum – policy making – an UTNWF information centre at the Ministry of Environment (MENR) will support the mainstreaming of water fund concepts and lessons learned into national policies and programmes.

59. Lessons and experiences in establishing the WF's public private partnership and in establishing successful payment for ecosystem services mechanisms will be brought to at least two other water towers in Kenya to assess the feasibility of replication and adaptation of the approach. Here, exchange with other PES experiences, e.g. in the World Bank's KAPSLMP (GEF ID # 2355), employing local SLM practices in different catchment areas, will be beneficial for the development of scale-out and scale-up strategies. The UTNWF will also support the consolidation of experiences for further advocacy within the IAP network of countries in sub-Saharan Africa, through MEA processes such as convention reporting and strategies (NBSAP, NAP, NAPA), and in MEA fora such as UNREDD or IPBES to promote wider application. It is further expected that the integrated approach to landscape management of the Upper Tana catchment will contribute to Kenya's obligations under the three Rio conventions and reporting requirements under the respective strategic action programmes of these MEAs (see also Attachment 4.1 to Appendix 4).

D. Lessons learned and adherence to IFAD policies

60. The 2013 COSOP identified three strategic objectives for IFAD interventions in Kenya:

- (a) Improvement of gender-responsive, climate-resilient and sustainable community-based natural resource management;
- (b) Fostering of access of vulnerable rural women, men and youth in target areas to productivity-enhancing assets, technologies and services;
- (c) Enhanced and sustainable access of vulnerable rural women, men and young farmers, agro-pastoralists and entrepreneurs to improved post-production technologies and markets.

61. In developing the UTNWF project documentation, the design team continuously referred to the COSOP, IFAD project design and supervision reports (particularly GWC, MKEPP, UTaNRMP and KCEP-CRAL), TNC experiences with water funds in Latin America and the enshrined lessons learned so as to build its intervention strategy on a solid and well-informed foundation. Among the major lessons learned retained in designing the UTNWF intervention strategy were:

On the establishment of water funds

- Develop a good business case for the water fund (including clear targets and benefits), based upon the best science available.
- Ensure financial accountability, transparency and sustainability in fund management, e.g. through
 - Financial resources managed by a fiduciary;
 - A good balance between public and private members in the water fund;
 - Public sector contributions through water tariffs and/or other contributions (local laws assigning funding to water fund, national law on ecosystem services payments, etc.);
 - Link water balance/watershed risks to corporate sector activities;
 - Use individual philanthropy where possible.
- Have a good baseline and monitoring programme focused on measuring impacts of the water fund, and periodically report results of the water fund to members and key stakeholders.

- For a water fund to become self-sustaining, it needs to be driven by water users and become an integral part of water management and allocation policy. For that to happen, good evidence is required on the beneficial impacts of watershed management for the quantity and quality of water resources and on the ability of payments and incentives to influence management behaviour.
- Start activities on the ground as soon as possible, and make sure they are “visible” to beneficiaries and donors/investors so as to maintain/increase support.

On the design of PES schemes and incentives

- The purpose of PES must be understood and accepted by all parties. Green Water Credits are payments for specified land and soil management practices which affect the provision of watershed services. They are not payments for water, payments for past activity or restraint, or a subsidy for conservation although this may be a collateral benefit.
- Buyers and sellers must be clearly identified. The buyers are downstream water users that benefit from security of supply (quantity and quality) and protection against damaging floods. The sellers are land users in the catchment who are in a position to determine water resources at source; they must have control over the use of land and water in the catchment.
- The specified management must be linked to the benefits required; cause-and-effect must be established between the management activities and improved groundwater recharge, stream flow and water quality; and control of erosion, siltation and flooding. Buyers must know that upstream land managers can effect these improvements, not only for the short term and aimed at receiving related benefits, but particularly to sustain these resource management improvements.
- Buyers need confidence that the specified management activities will be carried out to the required standard. Sellers need confidence that payments will be fair and will be made for long enough for them to benefit from their investment.
- PES schemes benefit from a supportive policy, legal, and regulatory setting. But they can operate successfully in the absence of land titles or formal PES laws.
- NGOs and civil-society organisations have an important part to play in ensuring that the poorest can participate in PES programs.
- Many PES programs have focused on using upland forests to deliver watershed services. However, farm practices in the catchment can also provide these services while, simultaneously, retaining or enhancing farm production.
- To enable the poorer farmers to take part, rules will be needed that allow for informal tenure and small land holdings, and which hold down transaction costs.
- Efforts should be made to enhance non-financial benefits such as capacity development and improvement in social organisation.

62. The existing baseline information will be further detailed to allow for the incorporation of **climate adaptation** strategies and a **gender-responsive** and disaggregated intervention approach to community based SLM. The integrated approach targeting ecosystem services and food security will further enlarge locally available livelihood options and foster agricultural production, including through climate-smart approaches and technologies.

63. UTNWF is based on a strong **public private partnership** approach to provide a broad variety of sustainable use and livelihood opportunities that will be targeted according to local needs. This extensive partnership will combine different experiences for implementation, while lessons from UTNWF implementation itself will be captured, promoted and enhanced through a comprehensive **knowledge management** strategy and brought to the attention of policy and decision makers for replication, scaling out and for policy traction.

64. Incorporating **value chain approaches** into its SLM components, as well as the establishment of a sustainable water fund with payment for ecosystem services mechanisms will improve **livelihood options** and **market access** for local smallholder farmers.

65. The project targets poor rural smallholder farmer households and therefore fully reflects IFAD's mission of enabling poor rural people to overcome poverty. The design of UTNWF complies with the following IFAD policies: private sector, targeting, land, gender, and environmental screening and scoping. The design also is in line with the IFAD Strategic Framework 2011-15, in particular with its Strategic Objectives of enhancing

- a natural resource and economic asset base for poor rural women and men that is more resilient to climate change, environmental degradation and market transformation;
- access for poor rural women and men to services to reduce poverty, improve nutrition, raise incomes and build resilience in a changing environment.

66. Further detail on lessons learned, existing knowledge and experiences from project interventions, supervision and evaluation reports and linkages with relevant strategies and policy documents can found in the Appendices 3 and 12.

67. The UTNWF design is also in line with TNC's Program Evaluation and Monitoring System (PEMS)⁵⁴, in that it has developed the five monitoring and evaluation outputs PEMS requires for each project: (1) a theory of change; (2) baselines; (3) project monitoring; (4) an 'exit strategy'; and (5) provisions for an impact evaluation. Once fully developed and online, PEMS will also be a good strategic guidance for UTNWF project management.

68. IFAD has developed a Complaints Procedure for "Alleged Non-Compliance with its Social and Environmental Policies and Mandatory Aspects of Its Social Environmental and Climate Assessment Procedures". Parties adversely or potentially adversely affected by IFAD-funded projects and programmes may bring issues to the Fund's attention using SECAPcomplaints@ifad.org. The IFAD website provides a clear summary of the steps involved and guidance on how to report issues.

Project implementation

A. Approach

69. The UTNWF project will work with public and private sector partners to establish the Water Fund as a sustainable financing mechanism to support sustainable land management and integrated natural resource management approaches in the Upper Tana catchment. Through its network of public agencies, NGO and CBO, the Project will support smallholder farmers in the Upper Tana catchment to adopt climate-smart sustainable land management practices, with the aim to increase food security and climate adaptation potential at household level, to stabilise and restore ecosystem services of the targeted area and to improve water quality and quantity for both upstream and downstream water users.

B. Organisational framework

70. UTNWF will be executed by The Nature Conservancy (TNC), together with several implementation partners, including the Ministry of Environment and Natural Resources, National Museums of Kenya, Water Resources Management Authority and Kenya Forest Services, through a direct grant agreement between IFAD and TNC, with disclosure to the National Treasury.

⁵⁴ TNC (2015): Program Evaluation and Monitoring System (PEMS) – an Overview for Project Managers. Fourth draft.

71. Other partners include the public and private sector partners that will constitute the Board of Trustees of the WF, Research Institutions and County Governments. To exercise its oversight, MENR will work with the executing agency/project management unit to establish a Project Steering Committee and Technical Committees with appropriate representation from UN convention focal points and both national and county levels to ensure alignment of the Project to ongoing programmes and activities of public and private sector partners of the UTNWF.

72. To achieve the long-term sustainability of the GEF investment there needs to be a seamless transfer of oversight and management from the GEF-supported project, UTNWF, to a public-private partnership – the Water Fund (see also the diagrammes in Attachment 5.1). Based upon an extensive consultative process with all partners that reviewed the various legal options available in Kenya, the preferred legal constitution of the WF is for a Charitable Trust instead of an NGO or Ltd. Company. The Government of Kenya has embraced public-private partnerships and has since established a Private-Public Partnership Unit at The National Treasury. The WF concept was introduced to the Unit head and the project will further engage with this PPP Unit for synergies and sharing lessons.

73. MENR will maintain its oversight role over the project, while delegating day-to-day management and implementation to TNC, which will set up, coordinate and host a Project Management Unit (PMU) on behalf of the WF Board of Trustees. The National Project Manager and technical staffs will be supported by TNCs dedicated team comprising a Kenya Programme Director, a Water Fund Director, Freshwater Director, External Affairs Director, Spatial Mapping Specialist, Programme Accountant, and a Procurement Officer.

74. The Project shall establish a Project Steering Committee (PSC) with representation from key line Ministries (MENR, MoALF, and The National Treasury), Departments, Agencies, County Government and Executing Agency. The project managers of UTaNRMP and KCEP-KRAL will also be members of the steering committee to increase project collaboration and linkages. The PSC will (i) review progress and achievements; (ii) provide strategic guidance to project management; and (iii) initiate follow-up actions on lessons and findings from the Project. As such, the PSC will act as the principal conduit between Project experience and national policies and programmes. The Terms of Reference for the PSC shall be jointly elaborated by the Ministry of Environment and Natural Resources and the Executing Agency. The PSC shall meet at least twice a year. The Chair shall be the Principal Secretary and the Co-Chair shall be from either from the Executing Agency or the Private Sector. The Project Manager shall act as the PSC's secretary, and shall ensure that adequate documents and proposals are prepared ahead of each PSC meeting and that notes are taken and duly disseminated.

C. Planning, M&E, learning and knowledge management

75. Planning of project activities will be undertaken by the PMU using a bottom-up and gender sensitive approach starting at sub-catchment and county levels. The county-level activities will be consolidated into a project Annual Work Plan and Budget (AWPB), while ensuring that all collaborating institutions and partners have their work plans and budgets also captured in or aligned to the consolidated AWPB. The first-year AWPB will be based on the detailed Project Design Document and its annexes. Subsequent plans should include a brief description of the implementation of the project during the period and the possible challenges and opportunities for the upcoming year.

76. A project inception workshop will be conducted within two months of project start with the full project team, relevant national and county government counterparts, partner organisations and IFAD. It is crucial to strengthen ownership of the project's goals and objectives and present the modalities of implementation and execution, as well as assist the

PMU in planning the first AWPB. An inception workshop report will be prepared and shared with participants and partners.

77. The M&E system will be deployed at two levels of project management: national PMU, and county implementation and support teams, including relevant partner organisations. It will be linked to and inform the Government's National Integrated Monitoring and Evaluation System (NIMES), be aligned with the IFAD baseline projects (UTaNRMP and KCEP-CRAL) and will be designed on the basis of the indicators and means of verification specified in the results framework. It will also build on the experiences gained by previous IFAD-financed projects, be consistent with the GEF Secretariat and IFAD procedures and guidelines, including the Results and Impact Management System (RIMS).

78. Each GEF IAP country project M&E system will be part of a broader integrated information system designed to ensure programmatic coherence and to inform investments in sustainable agriculture and food security in all participating countries.

79. The PMU, partner organisations and the stakeholders involved will define the methodologies for data collection and analysis for the logical framework indicators and those that will not be monitored as part of the M&E (e.g. RIMS indicators, such as number of individuals/ household members receiving project services). Additional quantitative and qualitative indicators can be selected and endorsed on a participatory basis, e.g. among those indicated in the summarily table on RIMS and GEB assessment and tracking tools (Attachment 6.1). These will complement the indicators currently presented in the results framework (introductory pages to the PDR). The indicators in the GEB assessment and tracking tools are aimed at measuring changes in land degradation, food security, climate mitigation and resilience. Attachment 6.1 distinguishes and clarifies which indicators will be monitored, quantified and reported as part of the M&A or M&E systems. In some cases, the indicated M&A tool will also facilitate reporting under the RIMS.

80. The main reporting outputs will be the Quarterly Operational Report, the Annual Project Report, the RIMS report, the GEF Project Implementation Review (PIR) and project publications in the form of journal articles, multimedia publications, etc. The PMU and IFAD will further submit a Project Implementation Review (PIR) to the GEF Secretariat on an annual basis.

81. The GEF-6 IAP Food Security Tracking Tool (TT) is an important instrument to track GEBs in line with GEF programme and Focal Area objectives, and to roll up indicators from the individual project level to the portfolio level and to track overall IAP programme performance and its contribution to the specific focal areas. The TT will be reported on three times during the life of the project, i.e. prior to GEF approval, at mid-term and at project end.

82. The PMU will have a dedicated M&E officer, also partly in charge of KM and communication activities, working under the supervision of the Project Manager. The project team will establish linkages and be supported by three KCEP-CRAL M&E officers positioned at the regional level, responsible for consolidated monitoring of KCEP-CRAL implementation activities in the counties.

83. For more details on learning and knowledge management reference should be made to Component 3. Appendix 6 provides a summary of project M&E, and reporting responsibilities, and an indication of the budget allocation.

D. Financial management, procurement and governance

84. The Upper Tana-Nairobi Water Fund (WF), which is being established under the Upper Tana-Nairobi Water Fund project (UTNWF), shall be incorporated as a Charitable Trust under the laws of Kenya. This status has been deemed appropriate for the purpose by stakeholders and the design team, as incorporation as a company would subject the entity to fiscal

regulations such as income tax, which would adversely affect the operations of the Water Fund.

85. In its initial stages, a Water Fund Steering Committee comprising of key stakeholders has been constituted which upon finalisation of the incorporation process, will transform into a Board of Trustees for high-level leadership, and a management board to guide WF operations. The Ministry of Environment and Natural Resources (MENR) will have an oversight role for the UTNWF project, while delegating day-to-day management and implementation to TNC. TNC will set up, coordinate and host a Project Management Unit on behalf of the UTNWF Board of Trustees. There shall be a Project Steering Committee (PSC) with representation from key Ministries (MENR, MoALF and the National Treasury), Departments, Agencies, County Governments and the Executing Agency. This should help address Private Sector Partners' concerns over the efficient use and the likely impacts of their investment pledges and resources.

86. UTNWF is a GoK project implemented under PPP arrangements. The resources flowing to the project are GoK funds but since funds will flow directly to TNC they may not be captured under the MENR in the printed National Budget. It will be TNC's responsibility to share the approved budget with MENR and provide updates on funds that have been received from IFAD. To facilitate proper budget monitoring and control, TNC will provide budget templates that mirror its code/chart of accounts to all implementing partners. The coding will reflect UTNWF project components, categories and activities together with funding sources (IFAD, Private Sector and Beneficiaries/Implementing Partners) to enable proper budget monitoring and control.

87. TNC will implement the project on the basis of approved Annual Work Plans and Budgets (AWPBs). The budgeting process will be done jointly between TNC and implementing partners. TNC will consolidate the budget, present it for approval by the PSC and share the approved budget with the Board of Trustees and MENR and Counties hosting project activities. A No Objection from IFAD will be required for each AWPB.

88. The GEF IAP grant will flow from GEF Secretariat to IFAD and then to TNC from where funds will flow to implementing partners and contractors. The grant contribution to the Endowment fund will be received by TNC and transferred to the account that will be designated by the Board of Trustees for purposes of capitalising the Fund. Capitalisation of the fund will be both from GEF resources with an allocation of USD 1,000,000 and from the private sector. The decision on the management and the choice of the trader of the fund will be a responsibility of the Board of Trustees.

89. IFAD will not be a party to the implementation partnership and or service contracts. This will be a responsibility of TNC, who will receive funds from IFAD, disburse it to implementing partners, or pay for services and account back to IFAD. The obligation of IFAD will be to disburse funds to TNC, subject to the terms and conditions of the grant agreement. Upon signature of the grant agreement, an IFAD-funded start-up financing of USD 0.5 million will be available to facilitate project staff recruitment and implementation of priority activities.

90. Funds flow will follow IFAD standard disbursement methods including direct payment method for payments above USD 100,000; replenishment method and reimbursement method where TNC will have pre-financed any expenditure.

E. Supervision

91. IFAD will undertake supervision, mid-term review and completion missions. It will field missions that combine addressing IFAD, GoK and GEF concerns. As is IFAD's standard operation procedure, representation from government will be included in all supervision missions; the project managers of UTaNRMP and KCEP-CRAL will also be invited to join the supervisory missions to strengthen project interactions and learning. Upon completion of each mission an Aide Memoire will be discussed and agreed with GoK and the executing agency;

and for each mission a single report will be filed, which meets IFAD, GoK and GEF requirements. A key responsibility of the supervision is to review progress against the declared targets set in the Project's logical framework and the progress towards the seamless integration of the UTNWF into the WF. To monitor the policy aims of UTNWF, IFAD PTA policy experts will be invited to join project supervision missions. The project shall avail resources to the Ministry of Environment and Natural Resources for monitoring activities, including the GEF National Steering Committee. If mission timings allow, missions will be combined with supervisions for UTaNRMP or KCEP-CRAL.

F. Risk identification and mitigation

92. The Project design, as summarised in the Logical Framework presented at the end of the Executive Summary, is underpinned by assumptions. Efforts have been made to make the Project design as robust as possible, by explicitly addressing the risk that the main assumptions do not hold in the design of the Project. Below table summarises the main assumptions and the risks associated with their failure; and describes the steps taken to prevent, minimise or mitigate these risks in the project design and implementation strategy.

Table 3: Main risks and mitigation measures

Risk	Risk Mitigation Measures	Rating
Weak capacities of devolved structures to manage implementation of activities	The project is being implemented under a public private partnership, a concept that is new to most public and private sector players. Some partners, including counties, may have limited capacity in terms of staff numbers, skills, experience and resources. The project will link with local and national partner organisations with relevant implementation and technical experience. Where appropriate, the project will provide capacity development as demanded by the partners to strengthen their delivery in the project.	M
Ongoing devolution process	With the devolution process ongoing, the sharing of responsibilities between national and county governments is still to be fully determined, adding to capacity challenges in executing tasks at the catchment level. The project will engage both levels of Government - the national and county levels. This will include, but not be limited to KWS, KFS, NEMA, County Commissioners, and County Directors for Water, Environment, County Executive Committees (CECs) for Water, Environment and Agriculture. At the same time, the ongoing devolution process opens opportunities as well, as the planning for major sectoral and overall development policies and strategies at county level can be supported and strengthened	M
Lacking coordination among partners leading to inconsistent approaches	Many partners at local, national and international scale invest in conservation and SLM practices in the catchment, often with duplicating or overlapping and even sometimes contradicting practices and approaches to SLM, INRM and monitoring and evaluation of their interventions. The UTNWF aims at providing a common platform for the promotion and M&E of SLM practices.	M
Climate related risks of droughts, floods and/or other weather incidents	UTNWF integrates resilience and adaptation strategies into its monitoring framework and its intervention activities to provide for biophysical measures to improve soil stability, erosion mitigation and climate-smart agricultural practices, as well as socio-economic coping mechanisms, incl. empowerment of marginalised groups and broader livelihood options	M
Insecurity about public private partnership modalities	Private sector partners have expressed concerns over the efficient use and the likely impacts of their resources and investment pledges. The UTNWF design team therefore suggested a Charitable Trust as the preferred legal status for the Water Fund to provide equal representation in the management of the Fund and return on investment. This was strongly supported by the private sector partners and endorsed by GoK. UTNWF will further seek to closely involve the PPP Unit of the in The National Treasury for synergies and sharing lessons	L

Project costs, financing, benefits and sustainability

A. Project cost

1. The indicative total Project cost is estimated at USD 33.6 million. Of this, approximately USD 7.6 million will be used to support the institutionalisation of the Water Fund (component 1); USD 18.7 million allocated to component 2 in order to support activities aiming to improve the Upper Tana catchment ecosystems; and approximately USD 4.7 million allocated to component 3 to ensure robust knowledge management and learning systems implemented to Direct UTNWF management and to share lessons both nationally and regionally. Lastly, direct Project management costs are estimated at USD 2.6 million, to which GEF will contribute about 0.35 million or approximately 5% of its total contribution.

B. Project financing

2. Over the five-year project life, it is estimated that the overall financing of the UTNWF will be as follows: (a) 7.2 million USD grant from GEF–IAP;(b) USD 3 million in-kind contribution to support administrative/project management costs from TNC; (c) USD 1.5 million as beneficiaries' in-kind contribution (mostly contributing to labor and material for building the rainwater harvesting and the fixed dome biogas system); (d) an additional capitalisation of USD 10 million pledged from ongoing private sector contributions to the Water Fund for its initial capitalization. It is estimated that 60% of the funds will be granted in cash and 40% in kind; (e) USD 11.9 million that local NGOs and counties have pledged as an in-kind contribution to mainly support water fund activities of component 2 and 3. Total Project costs are summarised in Table 4. Other contributions, including from the public sector, may further increase the total base cost provided here.

Table 4: UTNWF Components by Financier

Kenya
Establishment of the Upper Tana Nairobi Water Fund (UTNWF)
Components by Financiers

(US\$ Milion)	GEF		Private Sector		Beneficiaries		TNC		NGOs & Counties		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
1. Component 1: Water Fund Management Platform Institutionalized	1.6	20.7	6.0	79.3	-	-	-	-	-	-	7.6	22.5
2. Component 2: Improved Upper Tana Catchment Ecosystems that Support Livelihoods, Food Security and Economic Development	4.3	23.0	3.0	16.0	1.5	8.0	0.5	2.6	9.4	50.4	18.7	55.7
3. Component 3: Robust Knowledge Management and Learning Systems Implemented to Direct UTNWF Management and Share Lessons both Nationally and Regionally.	1.0	21.2	1.0	21.4	-	-	0.3	6.9	2.4	50.5	4.7	13.9
4. Project Management	0.3	13.2	-	-	-	-	2.2	83.2	0.1	3.6	2.6	7.9
Total PROJECT COSTS	7.2	21.4	10.0	29.8	1.5	4.4	3.0	8.9	11.9	35.4	33.6	100.0

3. **Start-up financing:** Upon project approval by the GEF and the signature of a grant agreement between TNC and IFAD, and before conditions for implementation readiness are met (financial management, bank accounts, signatories, first withdrawal application, etc.) an IFAD-funded start-up financing of USD 0.5 million will be available to facilitate early project implementation, as outlined in below compilation of priority activities at project inception.

Table 5: Project Start-up Financing (IFAD-funded)

Description of Start-up activities	Unit	Quantity	Unit Cost	Total
Inception workshop, finalization of AWBP	WS	1	15,000	15,000
Baseline surveys, incl. MPAT with elements of RAPTA and WEIA; Ex-ACT assessment; wetlands survey	Surveys	1	85,000	85,000
Stakeholder needs and expectation assessment	Survey	1	25,000	25,000
Update of LDSFs	Survey	2	30,000	60,000
Upgrade of water monitoring stations	Stations	10	3,000	30,000
Support to Water Fund governance structures' establishment	Meetings	10	5,000	50,000
Recruitment (PMU staff)	Person month	5	16,000	80,000
Conservation materials (biogas, water harvesting, plants etc.)	Lump sum		80,000	80,000
Development of M&E and communication strategies	Person month	4	15,000	60,000
Establishment of 2 information dissemination and communication centres	Lump sum	2	7,500	15,000
Total Cost				500,000

93. **UTNWF Structure of Costs.** The structure of costs has been defined along the 3 main components and project management:

1. Water Fund Management Platform Institutionalised
2. Improved Upper Tana Catchment Ecosystems that Support Livelihoods, Food Security and Economic Development.
3. Robust Knowledge Management and Learning Systems Implemented to Direct UTNWF Management and Share Lessons both Nationally and Regionally.
4. Project Management

94. It should be noted that from the third year of Project implementation onwards, the GEF contribution to the establishment of the Water Fund platform, in Component 1, and to all staff salaries is intentionally decreasing, as the Water Fund is expected to gradually take over those costs.

95. Some specific costs, such as salaries and monitoring and evaluation costs, have also been allocated to the components directly benefiting from those resources. For instance, since the GEF Project Manager is expected to be equally involved in the three components, the salary of this position has been allocated to the three components and to project management.

96. For further detail, reference is made to Appendix 9, as well as its attachments, detailing project costs and financing (9.1) and baseline investments (9.2).

C. UTNWF Direct and Indirect Co-financing Including Baseline Costs

97. Beyond the direct co-financing contribution that the UTNWF will receive in-kind and in cash from different financiers and partners, Table 6 below also estimates the total indirect co-financing and baseline contributions to the project. Indirect co-financing can be considered as investments into projects and activities, during the life of UTNWF, that also have an effect on UTNWF's targets or beneficiaries. This definition is mainly referring to the investments made by and for KCEP-CRAL. For example, the UTNWF will benefit from KCEP-CRAL's

investments into natural resource management, climate-smart agricultural practices, biophysical improvements in the Tana basin, or stakeholder capacity development. Similarly, baseline investments are investments that, although happened prior to the UTNWF, indirectly support the project's aims and activities (i.e. investments into past projects or policies that provide linkages and/or a tangible foundation for the better achievement of UTNWF targets).

Table 6: UTNWF Direct and Indirect Co-financing Including Baseline Costs

UTNWF *Direct and **Indirect Co-financing including ***Baseline Costs								
Direct UTNWF Co-financing Contribution					Indirect Co-financing & Baseline Costs			
GEF contribution US\$	Expected Private Sector US\$ in cash and in kind	NGOs & Counties US\$ in kind	TNC in kind contribution US\$	Beneficiaries in-kind contribution US\$	Estimated GoK indirect co-financing contribution through IFAD US\$	Estimated GoK baseline contribution through IFAD US\$	TNC Baseline Contribution US\$	Total US\$
\$7,201,835	\$10,000,000	\$11,886,000	\$3,000,000	\$1,487,800	\$37,886,000	\$61,914,000	\$4,000,000	\$137,375,635

* Direct cash or in-kind contributions to the UTNWF

** Investments by closely linked projects and activities during the life of UTNWF that will have a direct effect on UTNWF targets or beneficiaries.

*** Investments into past projects or policies that provide linkages and/or a tangible foundation for the better achievement of UTNWF targets

D. Summary of benefits and economic analysis

98. UTNWF is expected to generate substantial net incremental benefits for farmers and households in the targeted 3 counties (Muranga, Nyeri and Nyandarua). Overall, the project will benefit women, youth and men directly involved in crop activities. The farmers will be assisted in increasing their farm productivity and production by reducing soil erosion that is damaging both to crop production and to downstream water quality and supply. Moreover, farmers will be given access to agro-forestry plantations, irrigation and inputs.

99. Key potential benefits for smallholder farmers in the Upper Tana catchment are the adoption of climate-smart sustainable land management practices, increasing food security and climate adaptation potential and resilience at household level, stabilising and restoring ecosystem services in the targeted area and improving water quality and quantity for both upstream and downstream water users. Through close involvement of national and county level agencies and local NGO and CBO, rural communities will be better able to plan, target, implement and monitor development activities.

100. A number of indicative economic activities that may be supported by UTNWF were identified during the project design process. Seventeen illustrative models were prepared to demonstrate the financial viability of the expected investments (for further detail refer to Appendix 10).

101. The sustainable land and water management intervention activities will lead to carbon sequestration, which will benefit land productivity. It is estimated that approximately 1.6 million tonnes of CO₂ will be sequestered. The economic price of the carbon is conservatory estimated at USD 4 per tonne. Subsequent to the Paris' United Nations Climate Change Conference, the potential for carbon payments will be further explored by the Project. Different scenarios, following carbon price fluctuations, are presented in the sensitivity analysis in order to show how the Project's viability will change under each different situation.

102. **Summary results of models:** All models indicate that profitability of the targeted interventions is good, in case (i) market access is ensured, (ii) farmers properly adopt climate-smart agriculture, (iii) farmers receive Project financial and technical support. It can be concluded that development of activities supporting conservation agriculture and river preservation, will help households - including female-headed households - to embrace diverse practices that improve nutrition and ensure viable income opportunities.

103. Five main farm models have been prepared to represent the financial impacts the Project will have on direct beneficiaries. All models present a comparison between a situation without Project intervention (WOP) and a situation with Project intervention (WP). Depending on the zone where they live, farmers are expected to be involved on a different range of activities. The most significant investment for the farms are: the rainwater harvesting, drip irrigation (only in case of farm 3) and the biogas system (in Farm 5), which will be in part financially supported by the Project. Overall, the profitability indicators highlight that the activities proposed for each category are financially viable and have a positive impact on the income per farm.

Table 7: Summary of Farm Financial models

Summary of Farms' Financial Models				
Farms 1.5 acre	Net Income KES (year 6)	Net Present Value KES	Internal Rate of Return %	Return to Family Labour KES/Day
Farm 1	644,637	371,099	26%	1,931
Farm 2	623,158	764,719	55%	1,980
Farm 3	582,807	427,678	37%	1,811
Farm 4	1,013,572	777,414	30%	2,713
Farm 5	1,118,336	1,141,697	37%	3,000

104. Crop models have been prepared as building blocks for the farms' models. Each model compares a situations WP and a situation WOP over 10 years. Being cash crops, macadamia coffee and tea have the highest NPV. Macadamia is especially profitable because its market price is high and the main investments not particularly so. Therefore, although harvesting does not start earlier than the third year after plantation, returns are high already from the third year. The WP situation of all models takes into account the following climate-smart agriculture techniques as a result of Project intervention: (i) plantation of plants (e.g. trees or Napier grass); (ii) crop rotation, (iii) intercropping of maize and beans; (iv) minimal soil disturbance. The models show that when applying these techniques, which may be considered more costly or time-consuming, the returns per activity are high.

Table 8: Summary of Crop Models and Biogas Model Profitability Indicators

Summary of crops' financial models		
	Net Present Value KES	Internal Rate of Return %
Coffee (1 acre)	216,676	31%
Tea (1 acre)	268,611	25%
Maize/Beans	93,192	12%
Sweet Potatoes (1 acre)	11,989	32%
Tomato (1 acre)	82,147	71%
Spinach (1 acre)	89,394	68%
Tomato DI (1 acre)	200,280	80%
Spinach DI (1 acre)	150,137	62%
Macadamia (1 acre)	308,009	88%
Avocado (1 acre)	39,780	23%
Dairy cattle (5 cows)	694,303	57%
Biogas Model	364,283	95%

105. **Economic Analysis.** The overall economic internal rate of return (EIRR) of the Project is estimated at 20% for the base case. The net present value (NPV) of the net benefit stream, discounted at 12%, is USD 49, 9 million.

106. In order to test the robustness of the above results, a sensitivity analysis has been carried out. The sensitivity analysis investigates the effect of fluctuations in Project costs, benefits, adoption rate and delays in implementation on the Net Present Value and the Economic Rate of Return. It shows the economic impacts that a decrease in project benefits - of up to -50% - will have on the project's viability. Similarly, it shows how the economic viability of the project will be affected with an increase – of up to +50% - in project costs and with one and/or two years delay in project implementation. Moreover, since the carbon price is in continuous fluctuation, the analysis investigates the impacts on project viability if the price of carbon increases up to 20 USD/ton or decreases up to zero, so to also assess viability of the project if this positive externality is not considered at all. Finally, a deeper NPV analysis assesses that a minimum of 5,040 households, or 24% of the total number of targeted households, are needed in order to maintain a positive NPV. Overall, the analysis shows that the economic viability of the project remains attractive by preserving positive NPV and ERR in each case analysed.

Table 9: Sensitivity Analysis

	Assumptions	Related Risk	ERR	NPV \$ Million
Project Base Case			20%	49,970,375
Decrease in Project Benefits	-20%	Market/price fluctuations (changes in market demands). Changes in import/export regulations. Low crop yields. Delays in Project implementation.	18%	33,484,739
	-50%		15%	12,005,461
Increase in Project Costs	20%	Market/price fluctuations (changes in market demands). Changes in import/export regulations. Procurement risks.	19%	43,045,591
	50%		17%	35,907,589.9
Delays in Implementation	1 year	Unexpected delays in establishing the WF, delays in recruiting the new staff, any other unforeseeable event.	18%	35,721,363
	2 years		17%	25,266,563
Fluctuations in Carbon's Price (USD)	0	Fluctuation of carbon price. Unforeseeable event. Carbon sequestration' results are not as expected.	20%	47,804,258
	8		20%	52,136,492
	20		21%	56,366,973

E. Sustainability

107. UTNWF will establish a water fund as a sustainable financing mechanism to support sustainable land management and integrated natural resource management approaches in the Upper Tana catchment. The aim of the project and the Water Fund itself is to support targeted smallholder farmers in the catchment area to sustainably manage their lands through conservation and climate-smart agriculture, increasing their resilience to climate impacts and improving their livelihoods, while contributing to catchment conservation and restoration of ecosystem services. UTNWF will thus contribute to providing stable water quality and quantity to the downstream water users – the ones that support the payment for ecosystem services mechanisms enshrined in the Water Fund.

108. **Financial sustainability.** Core to the underlying concept of water funds is financial sustainability; payments for ecosystem services require both a market for suppliers and the demand of recipients. The three-year precursor phase to the UTNWF project gave ample opportunity to pilot SLM techniques and approaches for catchment restoration with smallholder farmers and to establish a broad consortium of private sector and public utility enterprises with a keen interest in protecting the water resource their production depends upon. The Water Fund will be founded on a solid endowment fund with resources from the consortium and GEF contributions, and will be seeking further partners and ODA donors during project life-time. The Water Fund consortium already successfully worked on a further funding stream through a continuous replenishment coming from a water price levy for

conservation, agreed upon by the GoK and about to be gazetted in October 2015. Building on experience from similar water funds in Latin America, it can be estimated with a high level of confidence that the Upper Tana-Nairobi Water Fund will be providing payment for ecosystem services well beyond the project life-time of five years. Economically, the business case prepared by The Nature Conservancy estimates that an investment of US \$ 10 million over a period of 10 years will return US \$ 21.5 million in economic benefits.⁵⁵

109. **Institutional sustainability** is strongly supported through the broad-based public private partnership approach to UTNWF. The Water Fund will be established as a charitable trust according to Kenyan law; NGO and CBO are aligned as implementation partners in the Upper Tana catchment, and national and county government agencies will be closely involved in both oversight and implementation to allow for M&E approaches to be embedded in national and county processes and for lessons to be adopted in national and sub-national policy frameworks. The knowledge management strategy for UTNWF foresees a systematic scaling up, initially to two other Kenyan water towers, and regionally and internationally through the project and programme network within the GEF FSIAP.

110. **Environmental sustainability** will be realised through the continuity of the payment for ecosystem services provided to smallholders by the Water Fund, thus providing external incentives for accruing environmental benefits from SLM and catchment conservation, as well as providing intrinsic motivation for the farmers. This will be achieved through the combination of environmental and socio-economic benefits, e.g. biophysical activities aiming at erosion risk reduction will be paired with climate-smart agricultural techniques leading to enhanced resilience and improved productivity, thus providing incentives for smallholder farmers to continue to apply climate-smart and conservation agriculture in the Upper Tana catchment.

111. Among the mechanisms built into the UTNWF implementation strategy that are aimed at supporting its sustainability are further:

- **Capacity development and knowledge management** – UTNWF aims at capacitating its project partners, smallholder organisations, NGO, county agencies and national governmental agencies, to incorporate its integrated approach into their own organisations' monitoring and planning processes. Investments will be made in capacity development at local scale and in supporting a system for land use assessment through the LDSF;
- **Mainstreaming through scaling out and scaling up** – UTNWF will actively promote its approach and lessons to be learned through public outreach and school programmes, as well as through the extension of its reach by undertaking feasibility studies in at least two other water towers in Kenya. Its close linkages with existing policies and national obligations to MEAs (see also Attachments 4.1 and 4.2) will facilitate the integration of its experiences into national policy making.
- **Fostering multi-stakeholder alliances and partnerships** – being a broad-based public private partnership itself, the UTNWF will establish a living example on how to forge and sustain alliances incorporating beneficiary groups, NGO, private sector and public service providers along an innovative implementation strategy. Any other agency can easily join or use the partnership to further ecosystem services and catchment rehabilitation in the Upper Tana catchment and beyond.

⁵⁵ TNC, 2015. Upper Tana-Nairobi Water Fund Business Case. Nairobi, Kenya.