

Green Water Credits

**Political, institutional and financial
framework for
Green Water Credits
in Kenya**

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Green Water Credits is a mechanism to pay rural people for specified land and soil management activities that determine all fresh water resources at source. These activities are presently unrecognized and unrewarded. This proof-of-concept program is supported by the International Fund for Agricultural Development (IFAD) and the Swiss Agency for Development and Cooperation (SDC).

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MAIN POINTS

Green Water Credits supports the current water sector reform in Kenya by providing a market-based mechanism by which many of the goals of reform may be achieved. The Water Act 2002 and National Water Resources Management Plan assign an economic value to water in all its competing uses. Green Water Credits creates a market between water users and water services providers.

Many farmers are engaged in green water management but they are hamstrung by lack of funds. Often, funds are lacking for enough seed to maintain ground cover, let alone to invest in costly structures like terraces. There is a general lack of credit facilities and the impact of informal credit arrangements is limited by the absolutely small amounts of money available.

Subsidies to farmers are a political sensitive issue; there is also the concern that cash may overtake all other considerations. However, Green Water Credits is not conceived as a subsidy but as a payment for a professional service. Monetary transactions are the norm in most fields and few other direct incentives are available; other possibilities such as credit or vouchers for schooling, livestock etc. may be more gender-sensitive.

Farmers and or their representatives should be involved in the design of contracts, especially in determining its content (duration and obligations of the contract) as there is a history of farmers entering into agreements without wholly understanding their consequences. The contract should preferably be signed at the group level which, in turn, enforces the contract obligations upon their members. This should be backed up by a clear channel for periodic monitoring and feedback on progress of activities.

Various institutional frameworks for Green Water Credits are possible. Intermediary organisations should be semi-autonomous with linkages to service providers, water users, and the public and private sectors.

Existing farmers' groups have systems in place for collecting and administering payments, monitoring and enforcing compliance with contracts at the field level. Decision-making is at the group level; farmers are willing to pay fees (up-front, or as a proportion of their produce) to deal with the collective costs and benefits.

Transaction costs must be kept to a minimum if a large project is to be successful. Existing micro-finance organisations have the capacity to managing payments of Green Water Credits. Effective administration of payments for environmental services requires a public-private partnership where public-civil society partners are responsible for direction and feedback on the implementation of water management and financial organisations are in charge of issuance and monitoring of payments. Testing of options in pilot projects is recommended.

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Abbreviations

AEZ	Agro-ecological zone
ASCU	Inter-ministerial Agricultural Sector Coordination Unit
CAAC	Catchment Area Advisory Committee
EIA	Environmental Impact Assessment
KARI	Kenya Agricultural Research Institute
MDGs	Millennium Development Goals
SWC	Soil and water conservation
TARDA	Tana and Athi River Development Authority
WRMA	Water Resources Management Authority
WRUA	Water Resources Users Association

1 Introduction

Green Water Credits is a market-based mechanism to support sustainable land and water management. The concept is that, if downstream water users pay the upstream water managers (farmers and other land users) for the water-management services, then the land users will be better able to safeguard water resources for everybody. At the same time, Green Water Credits will provide much-needed diversification of rural livelihoods. As part of the proof-of-concept, this report addresses the key questions: What are the present land and water rights and institutions of management? Do they enable Green Water Credits to operate? Who has capacity and authority to change them? It reviews the institutional environment, main organisations and policies affecting land and water in Kenya and, specifically, in the Tana Basin. It identifies opportunities for the implementation of Green Water Credits, potential conflicts, possible institutional and arrangements and financial mechanisms.

Kenya is undertaking radical reform of the water sector. Water is now treated as an economic good rather than, exclusively, a social good and there are significant institutional changes, aiming to decentralise management to the river basin level and provide an integrated approach to resource management. It is not yet clear how power will be devolved or how the various Government and non-Government organisations will cooperate and interact with civil society groups. However, introduction of Green Water Credits as a market-based mechanism to support land and water management is timely.

Information is drawn from a review of secondary sources; workshops and field studies, including discussions with key Parties; and from eight Focus Groups conducted in the Upper Tana in December 2006 (Green Water Credits Report 5, Porras and others 2007). Focus groups drawn from irrigators and, also, farmers practising rain-fed farming in the Upper Tana explored:

- *Organisational capacity:* This has been identified, time and time again, as a prerequisite of successful implementation of Green Water Credits. Focus groups were centred on existing farmers' or water-users groups and discussed their limitations and strengths, and possible local organisations for farmers as providers of water-management services.
- *Economic aim of the group.* Adoption of green water management (that is a package of soil and water conservation practices tailored to the local situation) depends on the economic returns to the farmers, set against the time, energy and resources needed. Groups considered their own economic orientation, and how green water management helps, or hinders, their performance. Partial information regarding type of production, farming areas, household sizes, costs of implementation of SWC, and income was collected to be cross-referenced with previous surveys in the area.

- *Experience of green water management.* Groups considered existing levels of green water management, who provides assistance and what kind, limitations and positive experiences.
- *Relevance of existing governmental and non-governmental organisations.* Participants were encouraged to provide their opinions on the perceived capacity (or gaps) of local institutions in promoting green water management in the district.

2 Institutional setting

2.1 Principles

Institutions may be defined as systems of established and prevalent social rules that structure social interactions (Aoki 2001). They range from the obvious - language, money, laws, and organisations; to the intangible – for instance, etiquette. In establishing an institutional framework for Green Water Credits, it is helpful to distinguish *organisations* and *rules*. The legal framework consists of formal laws and rules of operation. There are also informal rules - norms, customs and traditions that have an important influence on how formal rules are enforced, and whether laws are actually observed or not.

Green Water Credits may be considered an *institutional arrangement* between organisations that administer formal rules, such as the Water Resources Management Authority, and those which have other functions - such as farmers' organisations, private companies, and Ministries (Agriculture, Water and Irrigation, etc.). The institutional arrangement itself is governed by formal rules such as contracts, and informal, implicit rules, such as trust. These determine how the institutional arrangement will function (Figure 1).

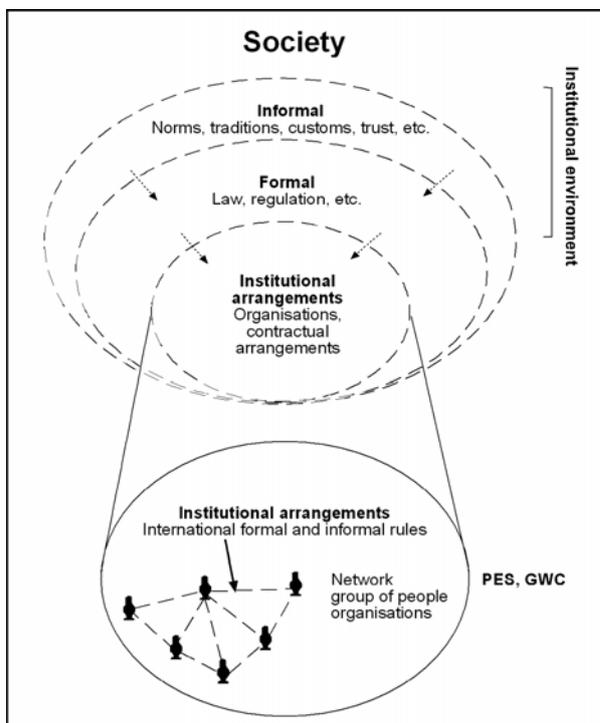


Figure 1: Institutional framework

Source: Eaton and Meijerink 2006

Rules influence may constrain certain actions or providing opportunities for other actions. Ideally, the different rules should reinforce each other and the resulting incentives or disincentives should lead to behaviour that will achieve the goal of the rule. For an institutional arrangement to succeed, the incentives it offers must promote its objectives, and the internal rules of the arrangement rule out fraud or non-compliance.

2.2 Institutional environment

2.2.1 Property and user rights to land

Farmers receiving Green Water Credits are required to make investments in the land. If their tenure is clouded or insecure, they will have less incentive to make these investments.

Land property rights: The regulation of property rights (e.g. land) is enshrined in the Kenyan constitution: the Constitution of Kenya (Rev 1998, Chapter V, Section 75: Protection and deprivation of property) gives the government powers of *eminent domain* (compulsory acquisition) and the *police power* (development control) to control access and use of land and to protect property rights.

Compulsory acquisition is the power of the state to extinguish or acquire any land title or other interest in land for a public purpose, subject to prompt payment of compensation (see also Land Acquisition Act, Cap. 295). This has been used to acquire land for road construction and other public utilities. Development control is the power to regulate property rights to ensure that the use of land is not injurious to the public interest; in the past (invested in various uncoordinated government agencies) it has not been effective in promoting access to land or sustainable land use practices (for example the use of Chief's Act. Cap 128, the Agriculture Act Cap 318, and the Agriculture Basic Land Usage Rules L.N 26/1965).

Land ownership and land tenure: Land tenure refers to the terms and conditions under which rights to land and land-based resources are acquired, retained, used, disposed of, or transmitted. In Kenya, tenure is fragmented, complex and pluralistic. Three land categories of ownership are recognized: Government Land, Trust Land and Private Land, which have different terms and conditions for access and use rights.

Government Land is land declared Crown Land by the Crown Lands Ordinance 1902 (all supposedly *waste* and *unoccupied* land) and which, at independence, was declared public land by the Government Lands Act (Cap. 280). Government Land is vested in the President who has powers to grant access, use rights and disposition of the land. In the Tana Basin, Government Land includes public land set aside for a specific purpose: *alienated land* and *un-alienated* land, forest reserves, townships, national parks, open water, land held by ministries, state corporations (e.g. Nyayo tea zones, national research institutions) and other public institutions.

Trust Land refers to all land that was not in private or government ownership at independence; it is without legal official title deed and is held in trust by county councils; in 1999, 78.5 per cent of Kenya was Trust Land. Each county council holds the Trust Land vested in it for the benefit of the persons ordinarily resident on the land, and grants access and use rights to a tribe/community or an individual under *African Customary Law*, subject to the rights of the Government to set the land apart for public use and/or the County Council to set such land apart for other beneficial purposes. The Constitution recognises African Customary Law with regards to Trust Land - provided that rights, interests and other benefits of such law are not repugnant to any written law (*The Constitution, Chapter IX, Section 115 (2): African Customary Law*). The Magistrates Courts Act (Cap. 10) Section 2 sets out the claims a magistrate can award under customary law regarding land held under such tenure.

Extensive areas in the Lower Tana basin are Trust Land. Land rights are held in trust by the county councils on behalf of the resident communities until such time that the land is sub-divided into individual holdings under the Land Adjudication Act (Cap 284). Because there have been no formal surveys or land adjudication in these areas, land is still held under customary tenure under which land inheritance goes from father to son(s). This has resulted in land fragmentation. Under customary tenure, women rarely inherit land; often they have only user rights, although they can purchase.

Private Land is land held by an individual or other entity under freehold or leasehold tenure. The owner of such land can use it as collateral security to access credit (Govt Kenya 2004). Freehold is the most common land tenure system in the Upper Tana. It was promoted by the 1954 *Swynnerton Plan for the Modernization of African Agriculture* which recommended conversion from communal/customary systems to private tenure through adjudication, registration and titling. Private land is registered under the Registered Land Act (Cap. 300). Freehold grants the individual owner-operator unlimited access and use rights, abuse and disposition - subject to regulatory powers of the state.

Leasehold involves the derivation of land access and use rights from a superior title for a defined period of time under agreed conditions including, but not limited to, the payment of rent. Leasehold provides a flexible mechanism for transacting rights in land and for control of land use. It is a private contractual right, subject to the conditions imposed by the owner, and grants exclusive rights to the leaseholder. In the Upper Tana, smallholders without enough land usually rent land from other households for a defined period (one agricultural season, one year, etc.) at an agreed rent or with share-cropping arrangements. Concession arrangements are also found where corporate bodies (e.g. Del Monte) have leased land for a specified period from parts of Government Land and/or from Trust Land.

As well as proper legal arrangements, there are squatter settlements, e.g. in parts of Mathira Division (Nyeri District) and Ndia Division (Kirinyaga District) following the breakdown of the *shamba* system of non-resident cultivation in the Mt. Kenya forest. Elsewhere, squatter settlements have sprung up where people have access to land for farming but have no security of tenure - and thus cannot undertake long-term land improvements such as green water management.

Land Acts and their relation to access and land use rights: Many statutes dealing with rights of ownership and control of land¹ apply to the Upper Tana; Provisions and loopholes in some of these acts include:

Government Lands Act: Section 3 of the Act gives the President the power (through the Commissioner of Lands) to 'make grants or dispositions of any estates, interests or rights in or over alienated Government Land'. The Act empowers the President to allocate public land at will and has been used to allocate public land, including forest lands, to individuals for settlements without due consideration to its suitability for purpose.

Trust Lands Act Cap. 288: Makes provision for rights in Trust Land and controls the occupation of such land. It sets out procedures for conservation of Trust Land, setting it aside for various of purposes likely to benefit the persons ordinarily resident in that area, and the transfer of such land to the Government. Generally, implementation of the Act has been weak; resulting in land degradation, forest encroachment and illegal/irregular allocations of land to individuals. This was common under previous regimes. The Government is now claiming land that was irregularly allocated.

Local Government Act: Local Authorities can alienate, own and sell Trust Land or to purchase such land within the jurisdiction of other local authorities. Under this Act, ecologically-fragile areas can easily be disposed of, with detrimental effects on the environment.

Land Adjudication Act: Provides for the ascertainment and recording of rights and interests in Trust land. Land so adjudicated is registered under the Registered Lands Act or the Land (Group Representatives) Act. Implementation is the responsibility of the Ministry of Lands. The adjudication officer is empowered to exclude areas of ecological importance, such as watersheds, from conversion to private land.

Registered Lands Act: Land that is adjudicated or set apart under section 117 and 118 of the Constitution Rev 1998 is registered under this Act. It confers freehold title to land and protects land that is registered. Under the Act, any person may acquire absolute ownership of any land once he or she is registered as the absolute owner. The Act promotes sustainable land management by providing security of tenure and exclusive right of access and control of land to the title holder, thereby giving the owner incentive to improve the land. The title deed can be used as security to obtain loans for land improvement. Weaknesses of the Act include:

- The perception that land adjudication and registration procedures do not ensure equitable distribution of land among household members. Female members of the household feel disadvantaged; in some cases they have become squatters;
- Incidences in which customary ownership and ways of bequeathing land (statutory laws notwithstanding) are disadvantageous to some household members in terms of security of tenure security; for instance where land title land is invested in one household member.

¹ See complete list of documents in the References section

Land Acquisition Act: Through this act, the government can change the ownership of the land - for example, to construct a road. The Act has been used to revoke freehold land titles, in some cases without adequate compensation.

Land Planning Act: This Act and the Physical Planning Act No. 6 of 1996 aim to ensure coordinated, economic use of land for development. They provide a *framework* for accommodating competing land-use demands, vesting relevant agencies with powers broad enough to cover land-use planning and zoning across the country. However, implementation has been selective, mainly to the planning of urban centres and the development of facilities such as roads and factories. Kenya currently has no national land use plan.

2.2.2 Institutions governing land use rights

Various institutions are responsible for managing land and conferring access and use rights (Table 1), in particular the Ministry of Lands (through the Commissioner of Lands), the Presidency, Land Control Boards (for resolving land disputes), Local Authorities (managing Trust Lands and enforcing land development control in urban areas), and Property Tribunals and the judiciary (for resolving land disputes). Under customary law, community elders and the Provincial Administration often mediate in land conflicts and allocations.

2.2.3 Limitations of current land Acts in promoting access and use rights over land

Customary land tenure and trust lands: Under customary tenure systems, land access and use rights are set by customary norms which guarantee access to land, including that of women. Increasing socio-economic pressures and the advent of statute laws have brought thorny debate about women's inheritance rights and their access to and control over land. Although, the Kenyan Constitution recognises African customary law in access and use of land (Judicature Act, Cap. 8, Section 3), its application has been secondary to statutory law, resulting in sporadic conflicts over access and use of traditionally-owned land.

Private Land: Despite the registration of land in the names of household heads, the rest of the family, especially sons, assumes land use and access rights based on customary tenure. The discovery that the registered land owner holds the land absolutely, free from the claims of other family members, has brought social upheaval, insecurity of title and access rights and, sometimes, litigation. To date, local customs and practices have not changed much with regard to land inheritance, especially in respect of division of land between sons and daughters.

Table 1: Institutions and organisations governing land use rights

<i>Institution/organisation</i>	<i>Role in governing land access and use rights</i>	<i>Comment</i>
The Presidency	From the Constitution, Ch V, Sect 75 (protection and derivation of property), Government has development control (<i>eminent domain</i> and <i>police power</i>) over any land Through Government Land Act, the President has powers to alienate, dispose and allocate Government Land at will	Both men and women may to own land; rights over private land/property are protected by the Constitution Government Land has sometimes been allocated irregularly - resulting in public demand to revoke such use right and titles
Ministry of Lands	The Commissioner of Lands, Ministry of Lands is the chief agency for land adjudication, registration and alienation (even for Trust Lands) The Land Control Boards (Divisional Land Control Boards, Provincial Land Control Appeals Boards and the Central Land Control Appeals Board) are established by the Minister of Lands in areas where land adjudication has been completed. They control dealings in all agricultural land including sale, transfer, mortgage and disposal.	Land adjudication, consolidation and registration of rights through various Acts were meant to confer individual exclusive rights. However, the pace has been slow, and there have been conflicts of the powers of the County Councils and the President to alienate Trust Land.
Local authorities (County Councils) and community representatives	County Councils are the custodians of Trust Lands; community representatives are trustees under the Land (Group Representatives) Act	In many cases, County Councils and community representatives have abused their trust by illegal or irregular disposal of Trust Land
Tana and Athi River Development Authority (TARDA)	TARDA is a public, statutory body under an Act of Parliament (Cap. 443 of the Laws of Kenya), mandated to carry out integrated development programs within the Tana and the Athi Basins	TARDA has access and control of some land in the Tana basin for initiating integrated development projects. In recent years, it has evicted squatters farming close to reservoirs, for instance near the Kiambere dam.
Traditional institutions/Clan elders	Where land adjudication and registration have not been completed, customary law is the norm for conferring access and use rights. Land conflicts are resolved through community elders, the Provincial Administration and/or Courts of Law	Under customary law, land boundaries between families are usually recognised as authentic by community members but there are often wrangles over land use and disposal.

2.2.4 National land policy

Over the years, shifts in policy, legislation and institutional practices have steered land use in different directions; often, new legislation has been passed while leaving previous legislation intact. To address these problems, the government has embarked on the formulation of national land Policy through consultation; the Draft National Land Policy (Govt Kenya 2007), currently under discussion, addresses:

1. *Land policy framework*: constitutional issues, land reforms, land tenure, land use and management, land administration and land issues requiring special intervention;
2. *Institutional framework for implementation*: structural reforms, policy framework for land management institutions, implementation support agencies, implementation framework and financing of land reform.

The Draft National Land Policy:

- Designates all land in Kenya as Public, Community or Private;
- Recognises and protects customary rights;
- Recognises and protects private land rights and provides for derivative rights from all categories of lands rights holdings;
- Recommends reform of the institutional framework for land administration and management, devolution of power and authority, participation and representation, justice, equity and sustainability. Three institutions are suggested for managing land affairs: a National Land Commission, District Land Boards and Community Lands Boards;
- A Land Court Division and District Land Tribunals will be set up for dispute resolution. Alternative dispute management mechanisms are recommended to strengthen access to justice in land-related matters;
- Policy formulation, implementation, resource mobilization, and monitoring and evaluation will be performed by the Ministry of Lands;
- Issues requiring special intervention, such as historical injustices and land rights of minority communities and vulnerable groups, will be addressed through the participation of such groups in decision making over land and land-based resources.

2.2.5 Water rights

Except for waters wholly within in a private landowner's domain, the Water Act 2002 vests all water rights in the state. Therefore, in principle, all water resources in Kenya are state-owned, and allocation is under the control of the responsible Minister and vested in the Water Resources Management Authority (WRMA) which allocates user rights to individuals. Property rights to groundwater coincide with land rights; any person intending to abstracting groundwater is supposed to obtain a permit from the WRMA. Within the riparian zones, some minimum width from the stream is supposed to be under natural vegetation to protect the stream but, in practice, farmers of land adjacent to streams clear up to the water's edge, contributing to reduced channel capacity, flooding, bank erosion, and siltation of reservoirs.

Following the reforms, water is allocated by permit. The Draft Rules provide four classes of permit from A for low-impact users, to D; the higher the class, the greater the need for investigation, consultation and monitoring. For irrigation, permits for smallholders are issued to eligible applicants following deposition of applications at sub-regional offices. Farmers with land adjacent to a stream may pump water and use it for irrigation on payment of an annual registration fee, but permits are not required for abstracting groundwater more than 100 m from a body of surface water. On the other hand, large-scale users are expected to undertake an environmental impact assessment in accordance with the requirements of the Environmental Management and Coordination Act 1999 and a permit will be granted only upon acceptance of the report.

The 2006-2008 Water Resources Management Strategy advocates water allocation consistent with availability and the needs of the Reserve (set aside for basic human needs and environmental flows) and promoting social harmony and economic production. Allocation, on the advice of the Catchment Area Advisory Committee, should comply with a catchment Water Allocation Plan. The compliance plan recognises that: (1) current water allocation may be outside the boundaries of the recommended quantities in the Water Allocation Plan; (2) many water users are currently not complying with regulations; (3) a period of time should be given to enable water users to comply; (4) many water users do not follow accepted codes of practice; (5) some water users may need support to become compliant, requiring time to generate the necessary support.

Irrigation is the main consumptive use of water. Many livelihoods depend on small-scale irrigation of horticultural crops for export; water is often obtained through illegal abstractions from rivers or canals and one pump may be shared by several families through informal arrangements - such that the issue of permit and ownership registration is of no effect. Therefore, it is foreseen that regulation may be achieved only through community policing through active Water Resource Users Associations.

Green Water Credits can contribute to the objectives of the Catchment Management Strategy by supporting green water management at the farm level, improving river regulation, *blue* water flows and water quality. At the same time, WRMA might require adoption of these practices by including the requirement for a Soil and Water Conservation Plan as a pre-condition for issuance of a water permit; it would be unfair if farmers were to contribute to increased water flows through green water management but be barred from using the additional water, but small-scale irrigation users and se for domestic purposes would fall under Class A permits.

2.2.6 Water resources legislation

The primary legislation is Water Act no. 8 of 2002. Water resources are also dealt with under several sectoral statutes: for instance the Agriculture Act (Cap 318) has provisions in relation to catchment conservation, but the Act stipulates that where any of the provisions of the Act are inconsistent with those the Water Act 2002, then the provisions of the latter shall prevail. Table 2 summarises key legislation that directs the management and supply of water and highlights its relevance to the Tana Basin. Many of the Acts are relevant to water resource management and, for

effectiveness, should be enforced in harness with the Water Act 2002 and the National Water Resources Management Strategy.

Table 2: Key water legislation

<i>Statute</i>	<i>Purpose</i>	<i>Comment</i>
Water Act No. 8	<p>Regulation and management of water supply and sewerage services. The Act establishes:</p> <ul style="list-style-type: none"> - Water Resources Management Authority - Catchment Area Management Committees - Stakeholder and community participation in water resources management and development - Water Resources Users Associations - Water Services Trust Fund - Water Appeal Board - Water Services Regulatory Board - Water Services Boards - Water Services Providers <p>The Act repeals Water Act Cap. 372 and some provisions of the Local Government Act</p>	<p>Decentralised institutions will better manage water resources</p> <p>Regional offices already operational</p> <p>Water Resources Users Associations presently nascent</p>
Lakes and Rivers Act Cap 409	<i>Inter alia</i> , regulates river and lake traffic, improves navigability and protects wildlife	The Act may be used to protect reservoirs
Irrigation Act Cap 347	In relation to national schemes, National Irrigation Board (NIB) established to formulate and execute policy; investigate establishment ; design, construct, supervise, administer and improve; in conjunction with WRMA, co-ordinate and plan settlement	Various organisations involved with irrigation. NIB was crucial in the development of the Mwea Irrigation Scheme
Tana and Athi Rivers Development Authority Act (Cap 443)	<p>Tana and Athi Rivers Development Authority (TARDA) established to advise Government on the institution and co-ordination of development projects in the basins:</p> <ul style="list-style-type: none"> - All development issues, including apportionment of water resources - Long-range development plan - Assessment of demands on land and water - Ensure close co-operation between agencies dealing with water abstraction and use - Liaise between the Government, private sector and foreign agencies in development issues to ensure best use of technical resources - Assist operating agencies in applying for funds - Commission necessary works for protection and use of water and soils 	TARDA is more active in the Lower Tana Basin where there is potential for irrigation
Forest Act 2005	Establishes Kenya Forest Service to manage forests, including those on water catchment areas, <i>inter alia</i> for environmental services such as soil and water conservation, carbon fixation	The Act can be used to conserve water catchments, in particular the Mt Kenya Forest and the Aberdares Forest
Agricultural Act Cap 318	To promote and maintain sustainable agriculture, conservation of the soil and its fertility, stimulate agricultural development in accordance with good land husbandry	The Rules have been used to promote soil and water conservation but lack of enforcement has permitted, cultivation of steepland and

<i>Statute</i>	<i>Purpose</i>	<i>Comment</i>
	Agriculture (Basic Land Usage) Rules specify provisions for catchment conservation, <i>inter alia</i> : <ul style="list-style-type: none"> - Protection against soil erosion - Maintenance of water quality - Protection of land from deterioration through disposal of water from roads, bridges or other works 	river banks, causing siltation in rivers and reservoirs
Environmental Management and Coordination Act 1999	Establishes an Environmental Management Authority (EMA). Part V covers protection and management of environmentally significant areas: rivers, lakes, wetlands, hillsides, mountain areas and forests; Section 47 provides for afforestation of steep lands, measures to curb soil erosion and the protection of water catchments	The EMA is active in the Upper Tana

2.2.7 Institutions involved in water management and supply

A principle of the water reforms is to separate water resources management from water services delivery. The Water Act 2002 created national and regional institutions to implement management and water service delivery (Table 3). Government institutions in the water sector operate hierarchically; national institutions provide policy direction technical support, while those at regional and community level are responsible for implementation.

Table 3: Institutions involved in water management and services delivery

<i>Institution</i>	<i>Responsibilities and activities</i>	<i>Comments</i>
Ministry of Water and Irrigation	Formulation of policy and legislation, sectoral coordination, monitoring and evaluation	Ministry responsible for water resources; empowers WRMA
Water Resources Management Authority (WRMA)	Planning, management, conservation of water resources Coordination of the Integrated Water Resources Management Plan Allocation, assessment and monitoring of resources Issuance and policing of water use permits Regulation of the construction of conservation and abstraction structures	Established in 2003 Regional office in Embu for the Tana Basin
Water Services Regulatory Board	Water supply and sewerage through provision of water services	National board serving seven regional boards, including the Tana Water Services Board
Catchment Area Advisory Committees (CAACs)	Advising WRMA on water resources issues at catchment level	Tana CAAC operational

<i>Institution</i>	<i>Responsibilities and activities</i>	<i>Comments</i>
Water Resources Users Associations (WRUAs)	Identify and register water users Participate in water allocation and catchment management Assist in monitoring, conflict resolution and co-operative management of water resources	WRUAs are in the formative stages in the Upper Tana, beginning in sub-catchments where the Mount Kenya East project is operating
Water Appeals Board	Arbitration of disputes	
Tana Water Services Board	Provision of water services in Tana Basin	Operational, based in Embu
Water Services Providers	Maintain, rehabilitate and develop infrastructure and facilities of the Water Services Board	
Water Services Trust Fund	Financial support for improved access to water and sanitation in urban slums and for the rural poor	Some community projects have accessed funds for water resource development
National Irrigation Board	Development, control and improvement of large irrigation schemes	Active in the Tana e.g. Mwea Rice Irrigation Scheme, Kirinyaga District
Tana Athi Rivers Development Authority (TARDA)	Development activities such as riverine protection, re-forestation	Not very active in the Upper Tana
Kenya Electricity Generation Company (KenGen)	Hydro-power generation Construction of water conservation structures	KenGen manages the seven dams on the Tana and can contribute to towards water resources management
Mt Kenya East Pilot Project for Natural Resource Management	Integrated natural resources management Capacity building of communities for effective participation	Active in institutional development at community level
National Environmental Mgt Authority	Monitoring of pollution and environmental degradation	Active in the whole Tana Basin
Large irrigators	Construction of water management structures	Beneficiaries of improved water supply
Nairobi Water Company	Water supply to Nairobi and some small municipalities	Water drawn from Sasumua, Ndakaini and Ruri reservoirs and groundwater

2.3 Water sector policy

Policy statements provide direction through translation of laws. Policy papers or strategies give detailed information on management of resources within the sector or sub-sector and provide the institutional framework and financial justification.

The *National Water Policy on Water Resources Management and Development* (Sessional Paper No. 1, 1999) states the need to decentralize provision of water supply and sanitation from central government to local authorities, communities, and the private sector, with the government's role to provide an enabling environment through policies and regulation. It also addresses the institutional framework, including participation of community representatives and the private sector, and finance. Provisions include:

- *Water resources management:* conservation and protection of water resources, and allocation in a sustainable, rational and economical way
- *Water supply and sewerage:* supply of clean water sufficient to meet needs and reduce poverty, while ensuring safe disposal of waste water and environmental protection
- *Legal and institutional framework*
- *Financing mechanism.*

Millennium Development Goals (MDGs): Issues in the water sector must be addresses to achieve goals 1 (food security), 2 (education), 3 (empowerment of women), and 4-6 (health). MDG 7 'to ensure environmental sustainability' also involves water management. In line with these goals, the Government of Kenya has put in place the target: 'By 2015, reduce by half the proportion of people without access to safe drinking water'.

Interim Poverty Reduction Strategy Paper 2000-2003 recognised that water is a catalyst for economic and social development, that and access to water for human consumption, agriculture, and livestock is a big issue in rural areas.

Economic Strategy for Wealth and Employment Creation 2003 – 2007 recognised that existing institutional arrangements, including those in the water sector, are a bottleneck in realising poverty reduction and need comprehensive reform.

The *National Water Resource Management Strategy 2006–2008* follows the provisions of the Water Act 2002. Issues include:

- Equitable access to water resources
- Sustainable use of water resources by making progressive adjustments to water use - to strike a balance between water availability and legitimate requirements, and by implementing measures to protect water resources. In this case, large small-scale users should have equal rights;
- Effective and efficient water use for optimum social and economic benefit.

2.4 Access to credit

Lack of finance and of credit is a brake on rural development and establishment of an effective and widely accessible rural financial system remains a challenge; only a quarter of Kenyan households have a bank account (Ardings-Kodhek 2003). In the past, the Agricultural Finance Corporation, the Cooperative Bank of Kenya and the cooperative movement provided affordable credit to farmers but these bodies have collapsed or failed to provide services. Micro-finance institutions that operate in some areas reach only a small proportion of smallholders, provide very short-term credit and their effective lending rates are high; the formal banking system does not provide credit facilities suitable for small-scale farming business (Govt Kenya 2004). The development of financial services to rural areas has been hampered by the cost of servicing widely-dispersed customers and lack of collateral. Rural micro-finance models in Kenya are described by Kibaara (2006).

Farmers' groups rely on informal finance, in-kind credit arrangements for seeds, and community access to micro-credit. The main source of micro-credit is the informal *merry-go-round* to which members contribute money regularly and vote on whom is to receive the lump sum contributed each meeting day; no interest is charged. Members of groups visited during the focus-group discussions were receiving KES 200-1000 through merry-go-round activities. About a quarter of the groups have adopted some characteristics of *rotating savings and credit associations* where members contribute monthly shares/funds and also disburse loans to members. This has roots in the traditional mutual guarantee system. The short-term loans issued to members are charged interest of up to 10 per cent with a 2 weeks repayment period.

In-kind micro-credit arrangements involving export companies were also reported. Farmers receive seeds of horticultural crops at planting time; the cost is recovered upon sale of produce to the same company. Similar procedures have also been used in promoting farmers' access to fertilizers for tea (by Kenya Tea Development Agency) and coffee (coffee SACCOs). However, arrangements for coffee production have slumped along with coffee prices.

Community-owned financial services include Financial Services Associations (*Village Banks*, promoted by K-Rep Development Agency) and Mbeu Savings and Credit Association (promoted by Embu Catholic Diocese). Membership is through purchase of shares, services are similar to that of commercial banks: compulsory savings, voluntary savings, fixed deposit, money transfer, business loans, agricultural loans, education loans, emergency loans and safe deposit, and charges interest on services offered (Box 1). The community contributes to share capital and to the setting up of a banking hall. The Mbeu Savings and Credit Association uses similar principles but without a banking hall; loan administration is done at various venues (e.g. under tree, in church compounds etc).

Box 1: Example of Micro-finance Institution: K-Rep

Kenya Rural Enterprise Program (K-Rep) group is a specialized micro-finance development organization operating K-Rep Bank and K-rep Development Agency. K-rep Bank is a commercial bank that provides micro-finance services (loans, savings and banking services) to low-income entrepreneurs and households that have no access to mainstream banks; K-rep Development Agency is its research and development arm and also Financial Services Associations, also referred to as *Village Banks*. The community contributes towards the share capital and the building that acts as a banking hall - with tellers, manager, and field monitoring officers. Membership is through self-help groups (*Kikundi cha muungano*). The initial requirement, for each member, is payment of registration fees and, thereafter, monthly share contributions. To access individual loans, members of the self-help groups form smaller groups (*Kikundi cha mkopo*) of about five for the purposes of guaranteeing each other. However, the loans of the smaller group still have to be approved by the committee of the *Kikundi cha muungano*. The loans attract interest which could be up to 15 per cent.

Other rural micro-credit sources include commercial banks (Equity bank, Commercial Bank of Kenya, National Bank, Barclays, etc.) and the government-led Agricultural Finance Corporation which, in the past was involved with government and donor-supported programs such as mechanization of the agricultural sector, livestock development, Guarantee Minimum Return, the Seasonal Crop Credit. Since the 1990s the Agriculture Finance Corporation has had operational difficulties. Smallholder farmer's access to micro-credit through commercial banks is limited by lack of collateral and working capital.

Table 4: Forms of credit for farmers in the Upper Tana

<i>Form</i>	<i>Description</i>
Merry-go-round	<p>Emergency and farming loans. Funds raised by:</p> <ul style="list-style-type: none"> - Monthly contributions from members (KES20-500/month) - Percentage of group sales (horticultural crops, honey, milk, etc) - Group activities - One-off group 'shares' - Water connection fees and fines (irrigation groups) <p>Funds are used for:</p> <ul style="list-style-type: none"> - Operational costs of the group (transport of produce etc.) - Grants to one member through group vote - Micro-loans payable with interest (e.g. KES200-1000, payable in 2 weeks at 10 per cent interest; in Kawawa Self-Help Group there are about 4 loans per KES500-1000 per month in rotation)
Raising and selling of tree seedlings	<p>Tree seed obtained free of charge from the Forest Department (through the group Patron)</p> <p>Sales seedlings to members</p> <p>Seedlings distributed to members according to attendance</p>

<i>Form</i>	<i>Description</i>
Development fund	Contributions from members (i.e. KES50/month in the Kawawa Group)
Financial services	Individual members of group may have access to agricultural input loans; not all of the groups reported access to these forms of credit
Seeds on credit from private companies	Seeds obtained on credit from export companies
Labour exchanges	Farmers contribute with labour. For example, irrigation connections in the Gakaki Group are paid partly with cash but mostly with labour
Access to external funds	Preparation of proposals for accessing funds of Constituency Development Fund (one group) American Embassy, Ministry of Water and Irrigation, Poverty Eradication Commission, Local Authority, and British American Tobacco (Gakaki irrigation group)

2.5 Key organisations for Green Water Credits

2.5.1 National ministries

There is a plethora of Government bodies dealing with natural resources and development and which may be relevant to the operation of Green Water Credits (Table 5). According to the Focus Groups, the main government bodies collaborating with farmers in the Upper Tana are the Ministries of Agriculture; Livestock and Fisheries Development; Gender, Sports, Culture and Social Services; of Water and Irrigation; and the Forest Department. These line ministries and their specialist agencies have the potential to support several facets of Green Water Credits. Mostly, their area of work and expertise involves training and capacity building, provision of technical services and extension, and implementation of government policies - including regulation and coordination of services. They do not have capacity to administer payments or manage micro-credit schemes.

Table 5: Relevant Ministries and functions

<i>Ministry</i>	<i>Functions related to Green Water Credits</i>
<i>Ministry of Agriculture</i>	<p>Agricultural policy and services Agricultural extension services</p> <p>Agricultural Development Corporation Agricultural Finance Corporation Crop production and marketing Horticultural Crops Development Authority Kenya Agricultural Research Institute Kenya Seed Company Nyayo Tea Zones Development Corporation Produce Boards (sugar, coffee, national cereals and produce, tea)</p>
Ministry of Water and Irrigation	<p>Water resources policy National irrigation policy Dam construction Flood control and land reclamation Public water schemes and community water projects Water quality and pollution control</p> <p>Kenya Water Institute National Irrigation Board Water Resources Management Authority Water Services Boards and Trust Fund</p>
Ministry of Environment and Natural Resources	<p>Environmental policy Forest policy, development of forests, agroforestry Environmental management (Lake Victoria Environmental Management Program) Water catchment conservation and protection</p> <p>Kenya Forestry Research Institute National Environmental Management Authority</p>
Ministry of Energy	<p>Energy policy, regulation, security and conservation Hydro-power development Renewable energy development</p> <p>Electricity Regulatory Board Kenya Power & Lighting Company Ltd. Kenya Electricity Generating Company Ltd.</p>
Ministry of Lands and Housing	<p>Land policy and physical planning Land adjudication, registration and transactions Survey Settlement matters Administration of State and Trust Land</p>

<i>Ministry</i>	<i>Functions related to Green Water Credits</i>
Ministry of Tourism and Wildlife	Wildlife conservation policy Kenya Wildlife Service
Ministry of Local Government	Local authorities policy By-laws for urban, municipal and city authorities Capacity-building in local authorities Local Authorities Loans Authority Local Authorities Funds (Provident, Superannuation and Transfer)
Ministry of Regional Development Authorities	Regional Development policy Capacity-building and support for regional development authorities Tana and Athi Rivers Development Authority Lake Basin Development Authority

2.5.2 Inter-ministerial Agricultural Sector Coordination Unit

The Inter-ministerial Agricultural Sector Coordination Unit was established in 2005 with the support of a multi-donor funding to focus on the implementation of the National Strategy for Revitalising Agriculture.

2.5.3 Water Resource Management Authority (WRMA)

Under the Water Act 2002, WRMA is responsible for the management, use and development of water resources. Its powers and functions are:

- Develop principles, guidelines and procedures for the allocation of water resources
- Monitor implementation of the National Water Resources Management Strategy
- Regulate and protect water resources quality
- Manage and protect water catchments
- Receive and determine applications for permits for water use
- Monitor and enforce conditions attached to permits for water use
- Determine charges to be imposed for the use of water
- Gather and maintain information on water resources and publish forecasts, projections and information on water resources
- Liaise with other bodies for the better regulation and management of water resources.

WRMA has regional offices in the main catchments; Water Resources Users Associations (WRUAs) are being established at local level but are not yet active (Figure 2).

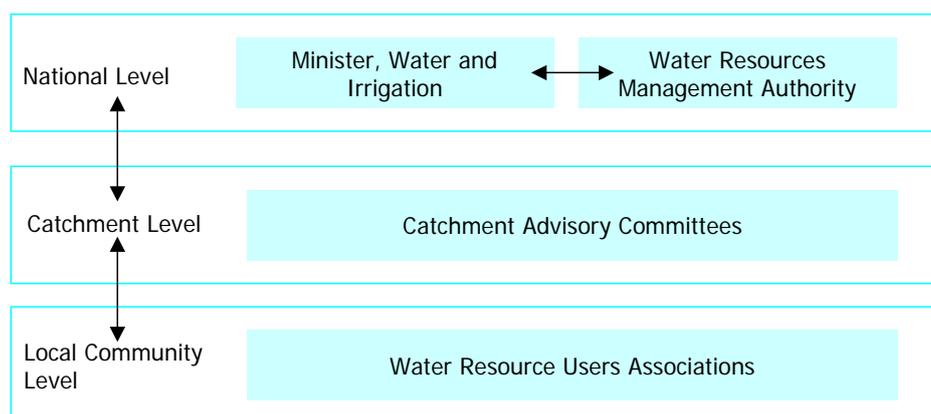


Figure 2: Management structure of WRMA

2.5.4 Private companies

As well as the big operators – KenGen, Nairobi Water Company and the large-scale irrigators - private sector groups in the Upper Tana include civil society organisations (NGOs and church-based groups), banks and other companies. The private sector offers a variety of cross-cutting services including:

- Micro-finance
- Community training and capacity building
- Extension services
- Marketing of produce
- Natural resource management

The private sector has significant advantages in handling monetary transactions, for example as micro-credit institutions. Their main limitation, until now, is that the coverage of their services in the Upper Tana catchment is limited.

2.5.5 Farmers' associations

Most farmers in the Upper Tana belong to some kind of association, and it is hardly possible to find a development or research organisation or government program that does not try to work with community-based groups (ETC 2007). These groups strengthen the hand of individual farmers and help them to cope better with risk. Group objectives may include: self-help, benevolence (social functions such as support in cases of sickness or with burial costs), micro-credit, enterprise and marketing, irrigation and domestic water provision, and tree planting. Membership varies - between 18-450 members, 4-70 per cent women in the groups interviewed during focus groups. Most groups have a leadership structure and rules; corrective actions are taken when rules are broken (Box2).

The focus groups agreed that collective action is a positive force. For example, the smallholder horticulture sector is a major foreign exchange earner but has been challenged by food quality and safety regulations introduced by the EU (EurepGap); with the support of donors and the private sector, it has risen to the challenge with intensive training.

Box 2: Community groups in Kenya

To be recognised as a legal entity, farmer groups are required to register with the Department of Social Services of the Ministry of Gender, Sports, Culture and Social Services. To register, a group is required to have elected officials, by-laws/constitution, and at least 15 members; it should be implementing self-help activities which are not political in nature, and must be operating in the district of registration. Registration brings access to capacity- building opportunities, linkages with relevant donors and sources of funds, and strengthens the cohesiveness of the group.

For the operation of Green Water Credits, farmers associations could taking on the role of water services providers and could constitute the first tier of the institutional arrangement required for Green Water Credits, in which case some overlap in concept and function with Water Resources Users Associations set up under WRMA would have to be sorted out; often they will be the same groups of people.

2.5.6 Farmers perceptions of land and water institutions

Farmers' attitudes to the various institutions and the services provided depends on close to the farmers' interests the agencies are, their presence in the community (an office where the group operates), and the service in question.

The public sector provides most training and extension services (Table 6), especially the Ministry of Gender, Culture, Sports and Social Services and the Ministry of Agriculture; training of agricultural development groups and the provision of equipment for laying out conservation structures is perceived to be a positive contribution. The Ministry of Water and Irrigation and the National Irrigation Board were reported by all the irrigation focus groups but their impact on rain-fed farming is limited. Forest-related activities, in the form of seedlings and nurseries, fall mostly to the public sector but there are also NGO initiatives.

Marketing of farm produce is dominated by the private sector which also supplies inputs, from seedlings to fertilizers; some organisations also provide credit for seeds. The public sector is notably absent from micro-finance which is provided by the private sector and self-help groups.

Table 6: Service organisations reported by focus groups

<i>Service</i>	<i>Organisations</i>	<i>AEZ</i>
Group formation and capacity building	Ministry of Gender, Culture, Sports and Social Services	I, II, III, IV
	Local/provincial Government	I, III
	CARE-KENYA	I
	Other Self Help Groups	II
	Local primary schools	I
Extension services Production and processing	Ministry of Agriculture	II, III, IV
	Livestock Department	I
	Ministry of Water and Irrigation	I
	Horticultural Crops Development Authority	I
	Technoserve	II
	KARI, Thika	II
	International Service for Acquisition of AgriBiotech Applications	II
	African Institute for Capacity Development	II
United Nations Development Programme	II	

<i>Service</i>	<i>Organisations</i>	<i>AEZ</i>
Water regulation and support of water groups	Ministry of Water and Irrigation	I, II, IV
	National Irrigation Board	III
Marketing Final produce and inputs	Agrochemical companies (Farmchem, Syngenta etc.)	III
	Horticultural Export Companies	I, III
	Central Kenya Dry Area Project	III
	Livestock Department	I
	Kenya Tea Development Agency	I
	HBIOI	II
	FarmNut	II
Micro-finance	Kenya Women Finance Trust	IV
	K-Rep Development Agency	II, IV
	Mbeu SACCO	IV
	Kenya Tea Development Agency	I
	Waterman Foundation	I
Forestry activities Seedlings, nurseries	Mt Kenya East Pilot Project (MKEP)	IV
	Forestry Department	I, II, IV
	Green Belt	III
	Forest Action Network	I
	Provincial administration	II
Agricultural research	KARI (KARI-NARL)	III
Infrastructure Dams, roads, fences	Community Development Trust Fund	I, IV
	African Wildlife Foundation	I

3 Policy reforms affecting land and water management

3.1 National Strategy for Revitalising Agriculture

According to the *Strategy for Revitalizing Agriculture 2004-2014*, the first steps in rural renewal will be devolution of decision-making to the district level through District Development Committees mandated to devise District Development Plans, and implementation of management to the grass roots with the empowerment of the local communities and authorities. National funding will be supplemented with resources raised locally. The Strategy encourages the financial sector to direct more resources to agriculture through: legislation to facilitate micro-finance institutions, incentives for commercial banks to set up operations in rural areas, recapitalisation and streamlining of the AFC to enable it to perform its function of providing affordable credit to farmers, and mandating the Agricultural Sector Co-ordination Unit to develop an Integrated Farm Input Strategy that encourages private sector-participation.

To enhance the productive value of land, the Ministry of Lands and Settlement will develop procedures for leasing land for production, develop procedures for raising collateral that do not depend on land ownership, and address the issues of land rights for women and minimum parcel sizes for farming. The government will support farmers' organisations through: streamlined procedures for their legal registration; education and capacity building - training in financial planning and management skills, contract management, marketing skills and skills in lobbying and advocacy; and encouraging their participation in policy formulation and program planning and implementation.

Green Water Credits meshes well with this strategy, in particular: the role of private-sector financial institutions, strengthening of individual land rights, especially for women, decentralisation of decision-making, and strengthening of farmers' organisations and involving them in land and water resources management.

3.2 Water Sector Reforms

3.2.1 Context

Kenya's vulnerability to the effects of the mismanagement and degradation of water resources called for a major policy response - and action. The reforms espouse the principles of integrated water resource management, at the river basin level, to address the both physical issues – land degradation, reduced blue water flows, siltation of reservoirs, degradation of water quality, flood damage, dilapidated infrastructure; and, also, increasing conflict over water use (including

illegal abstractions), the displacement of people, and institutional issues - poor coordination of sectoral institutions, lack of performance monitoring, rapidly declining investment and low revenue.

Through wide consultation, the Ministry of Water and Irrigation has put in place the National Policy on Water Resources Management and Development (Sessional Paper No. 1, 1999), the Water Act 2002, and the National Water Resource Management Strategy 2006-2008. Box 3 summarises the provisions of the old Water Act (Water Act Cap 372) and the main points of the reforms.

Box 3: Main features of old Water Act and the water sector reforms

Old Water Act (Cap 372)

- Ministry of Water Resources responsible for policy, regulation, implementation, financing, and supervision
- Limited consultations with interested parties
- Fragmented approach to water resources and development
- Weak financial base

Main points of Water Sector Reforms

- Separation of water resources management and development from water delivery
- Devolution of authority
- Water treated as an economic good
- Service provision market-driven

Catchments, rather than administrative divisions, are management units

The Water Act 2002 provides the legal basis for the new policy. Water is now considered as a socio-economic good, rather than as a purely social good. Management of water resources is separated from provision of water and sewerage - through the establishment of the Water Resources Management Authority (WRMA) to manage the resource, a national regulator (Water Services Regulatory Board), and Water Services Boards responsible for provision of services through Water Service Providers. Sustainability of service provision is meant to be addressed through: 1) a Water Services Trust Fund, to assist in financing water services to areas that are under-served; 2) community participation in water management, through Water Resources Users Associations; and 3) enforcement of payments for water services, and action against illegal water abstraction and connections.

3.2.2 Management institutions

Water Resources Management Authority (WRMA): An autonomous agency established by the Water Act 2002 to: develop principles, guidelines and procedures for allocation of water resources; management and protect water catchments; regulate use of the resource through permits; and liaise with other parties for better management and regulation of water resources. WRMA is preparing for the gazetting of new water resources management rules, currently out for consultation as Draft Rules and Norms. These cover protection of water bodies, decentralisation of services, stakeholder participation, water use permits and charges. WRMA strategy for institutional development includes stakeholder participation and

coordination, establishment of Water Resources Users Associations, and cooperative governance (liaison and integrated planning between government departments and district and local authorities). WRMA will create a forum for all stakeholders to meet at least once a year to coordinate their annual work plans. Hands-on management is devolved to the catchment level, where WRMA appoints Catchment Area Advisory Committees (Figure 2), based at regional offices.

Catchment Area Advisory Committees (CAACs). These are composed of 15 members, appointed by the WRMA, for each of six major catchments, including the Tana. Members are drawn from local communities, representing farmers or pastoralists, government ministries, regional development authorities, the business community, NGOs, and knowledgeable persons. CAACs are responsible for water resource conservation; an important task is to draw up a Catchment Management Strategy against which water resources will be allocated by granting, adjustment or cancellation of permits to water users.

Water Resource Users Associations (WRUAs): These are to be community-based organisations, intended to participate in the management of water resources at the sub-basin level, contributing local knowledge of the sub-catchment, river flows and groundwater behaviour, and should be consulted before any significant water management decisions are made by the WRMA - such as abstraction permits for large-scale users, gazetting catchment areas, riverbank protection, and licenses for quarrying and dredging. Capacity building will be needed to enable members to participate effectively in sub-basin management. From the perspective of Green Water Credits, these community-based organisations may be considered as not just water users associations, more *water resource management associations*, since farmers are also water providers, and rain-fed farmers bank a great deal more water than they draw upon.

Water Services Regulatory Board: A national body responsible for determining standards for the provision of water services and issuing licenses for provision of water services and to consumers through decentralised Water Services Boards.

Water Service Boards: The seven operational water services boards include the Tana Water Services Board. They manage water services assets and are responsible for provision of water services through licences to Water Service providers. Strategic objectives include: increasing accessibility and availability of water and sanitation services, strengthening institutional capacity, and financial sustainability.

Water Service Providers: Maintain, and develop water services infrastructure and facilities and provide water supply under licence from Water Services Boards.

Water Appeals Board: Determines disputes between water users and WRMA Regulatory Boards.

Water Services Trust Fund: Mobilises resources and provides financial assistance for improved access to water and sanitation in under-served areas. Funds come from parliamentary grant and donors.

3.2.3 Soil and water conservation in the water reforms

The draft Water Resources Management Rules and Forms (WRMA 2006) provide for Soils and Water Conservation Plans (Box 4):

Box 4: Draft Rules and Norms – Soil and Water Conservation

88 Soils and Water Conservation Plan

88(1) For the purposes of conserving the catchments and riparian areas, the Authority may by Order or stated as a condition on an Authorisation or Permit require a person to prepare and conform with a Soil and Water Conservation (SWC) Plan.

88(2) Criteria for Requiring a SWC Plan

In requiring a SWC Plan, the Authority will be guided by the following criteria:

- (i) Existing condition of the riparian area, risk of bank erosion, sources of direct runoff into the water course and sediment sources within the riparian and catchment areas;
- (ii) Slope of the land in excess of 15 per cent;
- (iii) Land use and land management practices and the risk of soil erosion and destruction from excessive direct runoff;
- (iv) Presence or otherwise of soil and water conservation structures;
- (v) Potential water resource pollution arising from the land use;
- (vi) Any other criteria that the Authority considers to be significant.

88(3) Development of a SWC Plan

- (a) The Plan may be developed by the landowner, operator, or WRUA in consultation with the officers in charge of agricultural/ environmental activities and the Authority.

88(4) Format for a SWC Plan

- (a) The SWC Plan must substantially follow the format ... laid out below:
 10. *SWC Plan*
 - 10(1) *Existing SWC Practices and Conditions*
 - (a) *Existing SWC structures and practices;*
 - (b) *Potential sources of sediment and other pollutants to the watercourse;*
 - (c) *Slope of land;*
 - (d) *Condition of the riparian land;*
 - 10(2) *Site Sketch*
 - (a) *Demarcation of boundaries of land covered under the SWC Plan;*
 - (b) *Identification of significant features;*
 - 10(3) *Proposed Measures and Targets for Improved Soil and Water Conservation*
 - (a) *Adoption of Best Practices;*
 - (b) *Targets and timeframe for adoption and implementation of proposed SWC structures and practices;*
 - (c) *Schedule of Inspection of the SWC Plan;*

88(5) Failure to Comply with SWC Plan

- (a) If in the opinion of the Authority the landowner or operator fails to comply with an approved SWC Plan, the Authority may cause to be rectified, constructed or monitored sufficient soil and water conservation measures for the purposes of conserving water resource quality conditions.
- (b) The Authority may recover the cost of these measures from the person or persons who have failed to comply with their SWC Plans.
- (c) Any person who fails to comply with their SWC Plan will be deemed to have committed an offence.
- (d) Failure to comply with an approved SWC Plan may be considered by the Authority as a basis for rejecting, suspending, cancelling or varying a water use permit.

3.2.4 Catchment management strategy

The draft *Catchment Management Strategy: Tana Basin* (WRMA 2006) is a framework for integrated water resources management, applying priorities defined in the Water Act 2002 - including equitable sharing of water; poverty eradication; and transparent allocation in relation to water availability, the needs of the reserve, and the need to promote social harmony and economic production. Issues include:

- Management and administration
- Water balance/reconciliation
- Water allocation and use
- Water resource protection
- Catchment protection and conservation
- Institutional development and support
- Water infrastructure development and management
- Monitoring and information management
- Financing and implementation.

Box 5 summarises the water catchment protection and conservation activities - included under the heading of conservation of farmlands

Box 5: Tana catchment management strategy – activities under conservation of farmlands

- Identify and classify farmlands
- Check the conservation status of farmlands
- Acquire information on the owners of the farmland and farm sizes
- Map the farms
- Identify the communities and the social structure
- Identify the stakeholders
- Form WRUAs and mobilise resources for WRUA activities
- Refer to Acts governing conservation of farmlands
- Identify activities on the farmlands
- Create awareness of the need to conserve farmlands and consensus to stop destructive activities
- Build SWC capacity in the community
- Re-vegetate the waterways in a participatory manner
- Allow for vegetation establishment in waterways
- Control the use of waterways as cattle paths
- Assess the status of the waterways and repeat the process making adjustments as appropriate
- Promote the adoption of best SWC practices at farm level (WRMA can leverage the adoption of these practices by placing the requirement for a Soil and Water Conservation Plan as part of the water permit in accordance with the WRM Regulations)
- Discourage land use practices that may cause landslides
- Plant conservation crops, encourage farmers on best use of land, e.g. Napier grass along riverbanks

The Green Water Credits process is almost exactly parallel to the development of an effective Catchment Management Strategy; the technical and institutional requirements of integrated water management are the same as needed to manage Green Water Credits; they can make use of the same data and procedures. What is missing from the present draft Strategy is the concept of farmers as *water suppliers*. The draft Strategy focuses on developing water storage in terms of dams; opportunities for free water banking in the soil and through groundwater recharge are not explored, although the water storage in the soil reservoir is an order of magnitude greater than storage behind dams (Dent and Kauffman 2007).

The draft Strategy envisages that development funds will come from revenue raised by WRMA, Government off Kenya budgetary support, donor funds and from the private sector. Local revenues are also to be raised from permit fees, data, services, water use charges, and penalties. Financial support to WRUAs is envisaged from the Water Services Trust Fund, Constituency Development Fund, Local Authority Transfer Fund, NGOs, and the private sector. It is also envisaged that donor support for WRUAs can be obtained when business plans are developed.

4 Institutional and management structure for Green Water Credits

4.1 Context

Simple green water management measures, applied to farmland, can significantly improve river regulation, *green* water resources, *blue* water flows, and water quality, at the same time arresting soil erosion and the siltation of reservoirs (Kauffman and others 2007). This is very cost-effective; increased water revenues alone can cover the modest cost of green water management (Hoff and others 2007). Farmers are aware of their private, on-site benefits from green water management but an additional, *long-term* incentive is required to cover the farmers' costs of implementing best practice and maintaining physical structures on their land - the more so when poverty drives the need for short-term returns (Porrás and others 2007). Previous incentives have proved not to be sustainable; ETC (2007) summarise their shortcomings:

- *Soil and water conservation was perceived as colonial activity and, therefore, discarded;*
- *Incentives were short-term and not always supported by ongoing training and capacity building;*
- *Incentives were not enough to outweigh the maintenance costs of physical structures like terraces;*
- *No organisation was in place to ensure continued collective maintenance;*
- *Lack of ownership by farmers;*
- *Lack of funds and on-farm to continue management practices and to maintain structures; farmers need to hire out their labour to earn money.*

Based on previous experiences and information from the Focus Groups, incentives need to:

- Be substantial enough to tip the balance of costs and benefits;
- Provide short-term, on-farm *economic* benefits for the farmer;
- Provide reliable income over the long term (a payment that disappears after one year will be less attractive than long-term access to soft credit);
- Include training and capacity building;
- Be conditional on performance.

Green Water Credits is designed to provide this reliable, long-term incentive.

4.2 Legal and institutional framework

The feasibility and viability of Green Water Credits derives from Kenya's water reforms. The reforms espouse integrated water resource management and consider water as an economic good; it has economic value in all its competing uses. The introduction of a market-based mechanism, supporting these reforms and offering a continuing incentive to undertake green water management, is timely.

Responsibility for water resources management is vested in the Water Resources Management Authority. Decentralization and involvement of the private sector are at the heart of the policy reform; management is devolved to the river basin level and it is intended to draw upon local knowledge and experience by through the participation of water users and managers at the local level. It is not yet clear how authority will be devolved or how the various government and private sector agencies and civil-society groups will work together so it is not appropriate for the proof-of-concept to construct a detailed institutional framework for Green Water Credits.

In outline, a public – private partnership is required, embracing:

1. Service providers: farmers or farmers' groups;
2. Service users: individual water users or users' groups;
3. Management.

4.2.1 Service providers

In the Upper Tana, and typically throughout the developing world, the service providers are mostly smallholders who manage just a few acres, often without legal title. From the point of view of Green Water Credits, organisation of these many thousands of individual households into autonomous groups that can operate as larger management units has several advantages:

1. More effective control of runoff and soil erosion;
2. Groups provide mutual support and can be better served by extension services;
3. Groups have a more effective voice in negotiations. Farmers' representatives need to be involved in developing the terms of contracts - content, obligations, duration, rates of payment (there is a history of farmers entering into agreements without understanding the consequences);
4. Groups can be self-policing, are able to monitor compliance with the terms of the contract and apply sanctions in the case of non-compliance;
5. Many farmers' groups already have mechanisms for receiving and managing credits on behalf of their members.

Farmers' groups – effectively local water resources management associations - can distribute or use these funds according to their own internal decisions, as long as they continue to comply with the terms of contract with the water users or intermediary organisation.

4.2.2 Service users

This is a disparate group. Large water-users like KenGen, Nairobi Water and large irrigators have well-defined needs, individual capacity to represent their interests, and financial resources to contribute individually to a managed Green Water Credits Fund. Alternatively, they have the capacity to enter into Green Water Credits agreements in their own right.

The public interest, including maintenance of environmental services may be represented by government agencies and NGOs. Government may choose to contribute to a managed Green Water Credits out of general taxation or from earmarked funds, such as GEF facilities. Wider international interests may be represented by international agencies and investors.

4.2.3 Management

Management involves:

1. Assessing water resources, demand, and optimum allocation;
2. Assessing opportunities to maximise the resource through land use and management;
3. Appraising costs and benefits of improved management;
4. Providing a platform for negotiation between land users as service providers and water users as buyers of this service;
5. Contracts between the service buyers and service providers;
6. Establishing and operating procedures for collection and payment of credits, receipt and verification of claims, and settlement of disputes.

Various structures for payments for environmental services operate elsewhere (Grieg-Gran and others 2006):

- *Direct contracts between buyers and sellers:* e.g. the La Esperanza Hydro-power project in Costa Rica signed a 99-year contract with the Monteverde Conservation League to maintain the watershed protection provided by 3000 ha of cloud forest
- *Intermediary-based transactions:* where a contract is negotiated between an intermediary and the buyers, on one hand, and the sellers on the other hand. The intermediary may be a government agency or an NGO. This category also includes trust funds, e.g. the Water Conservation Fund in Quito, Ecuador, which pool contributions made by various water users
- *Area-based schemes:* where rules and rates of payment are set out in national or local regulations, usually after negotiation. An intermediary organization may be involved in administering the contracts. Examples of national schemes include payments for environmental services in Mexico and Costa Rica
- *Product-based mechanisms:* whereby producers who meet the requirements of certification schemes (e.g. *salmon-safe* certificates in the USA) receive premium prices and improved market access
- *Sophisticated trading mechanisms:* such as credits, licences and use rights. These have been used only in developed countries, e.g. salinity credits and open auction to provide environmental services in Australia.

In developing countries, simple mechanisms like contracts have mostly been used and intermediaries have played an important role in bringing buyers and sellers together. It is vital that the intermediary be well-established and adequately resourced.

Agencies of the Ministry of Agriculture, Ministry of Water and Irrigation, and Ministry of Culture, Gender, Sports and Social Services already have experience and expertise in the first three tasks. The Water Resources Management Authority, as the legally responsible government agency could be the intermediary and provide a platform for negotiations between the water users and the service providers. Operation of the financial mechanism may be best accomplished by a financial institution such as a bank with expertise in micro-credit and the rural sector.

Simplicity of management is a priority for effective operation and to hold down transaction costs, which should not engross all the funds available. There are advantages in setting up a pilot operation, for instance for the proposed fast track scheme to address siltation of the major reservoirs, so that an effective basin-wide or national organisation can draw on growing experience. Management issues include:

1. Existing farmers' groups have various levels of stability and range in size from a score to a few hundred members. Most operate independently without links to higher-level organisations; past experience of group management made groups cautious of joining larger groups because of rampant cheating involving politicians.
2. The Water Resources Users Associations envisaged within the WRMA structure have yet to be established. There is some overlap of concept with the water services suppliers groups (Farmers' groups) envisaged in Green Water Credits.
3. Either direct buyers of services or an intermediary organisation has to enter into contracts directly with the Farmers' Groups which, in turn, monitor compliance and are accountable to the terms of contract, which should specify:
 - 1) Area and location
 - 2) Green water management package with defined standards
 - 3) Schedule of payments or other incentives;
 - 4) Terms of compliance, to encourage cooperation and discourage free riding; cooperative management should be in place to discourage free riding or defaulting, including penalties on the group for non-compliance;
 - 5) Certification procedure to trigger payments. When a revolving fund is established, the penalty may consist of withdrawing the fund, or increasing the interest rates;
 - 6) Farmers and or their representatives should be involved in the design of contracts, especially in determining its content (duration and obligations of the contract);
 - 7) This should be backed up with a clear channel for periodic monitoring and feedback on progress of activities.

An Intermediary Organisation must maintain independence. Were it to become too closely aligned with the farmers, there would be temptation to pay the Farmers' Groups regardless of compliance, which would undermine the whole scheme.

4.3 Financial mechanism

4.3.1 Structure of the mechanism

Three financial functions have to be accomplished:

1. Collection of fees from water users and contributions from general taxation and outside investors, to be held in a Green Water Credits Fund;
2. Management of the Fund;
3. Payment of credits to service providers.

4.3.2 Kinds of payment

Within the administration, cash payments to farmers are a sensitive issue, recalling former policy of subsidising farmers for soil and water conservation - which is now in disfavour. However, Green Water Credits is not a subsidy; it is a payment for services. Monetary transactions underpin the economy, including the farm sector; few other direct incentives are available – possibilities include revolving funds for *soft* credit, or vouchers for schooling, livestock or other items but many of these are gender-sensitive. In any case, these transactions must have an appropriate contractual basis and monitoring of performance.

4.3.3 Payment mechanisms

Micro-finance organisations can handle the issuance and monitoring of payments. The public-civil society partners can be responsible for steering, advice, and feedbacks on implementation of green water management and the resulting wider water benefits. K-rep Bank has devised and trialled a low transaction-costs mechanism for numerous small payments, such as will be necessary for Green Water Credits. The system uses the widely available GSM infrastructure and technologies, which include:

1. *SokoTele* disbursement terminals at the water services buyers or at a central Fund;
2. A *smart card* enables the farmer or farmers' group to withdraw money at local outlets that have a mobile phone connection;
3. The system incorporates procedures for registration, agreement on disbursement between water buyer and services provided by the farmer, and can generate a legally valid record of all transactions, electronically and also as a paper trail.

4.3.4 *Asymmetric information*

The economics literature gives much attention problems of *asymmetric information* where parties to a contract are not equally well-informed. One is *adverse selection*, whereby the agent (the party who implements the contract, in this case the farmers) holds private information. For instance, only farmers know how much it will really cost them to implement green water management in terms of cash and labour and have an interest in overstating during negotiations; costs must be independently established so that a fair price for the services provided can be arrived at by informed negotiation.

This problem increases when the principal has to deal with different agents, each agent with different characteristics in terms of production process and costs. The principal would like to pay according to actual costs (in fact marginal costs) – so that the agent with low production costs receives a lower payment than the one with higher costs; or the principal would like to enter into contract only with those who have low costs (Antle and Stoorvogel 2003). In the case of Green Water Credits, the many agents differ greatly with respect to resources and capacity. The Program may choose to concentrate on the most cost-effective farmers, farmers in key locations (e.g. for reservoir protection), or attempt a wide uptake. In any case, a scale of payment that is the same for all farmers will be the simplest to administer and most equitable.

A second contract problem is *moral hazard*, where the agent's action is not verifiable. Parties to the contract have the same information when the relationship is established but informational asymmetry arises after the signing of the contract when the principal cannot observe the action (or effort) of the agent, or the principal cannot perfectly control the action. For Green Water Credits, the principal cannot observe the quality of the management because of high transaction costs. This may be mitigated by contracts, verification and monitoring is done at the level of the Farmers' Group, so that groups may be monitored as wholes.

A third information problem is the fact that the effectiveness of green water management and, hence, the outcome of the service provided depends on the weather – it is unpredictable. In a dry year there will be less soil erosion and siltation but also less water delivery downstream; in a wet year the opposite. It is not practicable to pay per unit of water delivered or tonne of sediment retained, only for quality of the management, according to a long-term average performance which can be estimated by modelling.

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- Miscellaneous Ministry of Water and Irrigation documents

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- Registration of Titles Act, Cap 281
- Land Title Act, Cap 282
- Land Consolidation Act, Cap 283
- Land Adjudication Act, Cap 284
- Registration of Documents Act, Cap 285
- Trustees (Perpetual Succession) Act, Cap 164 (formerly Cap 286)
- Land (Group Representatives) Act, Cap 287
- Trust Land Act, Cap 288
- Trusts of Land Act, Cap 290 (Cap 289 repealed)
- Equitable Mortgages Act, Cap 291
- Wayleaves Act, Cap 292
- Distress for Rent Act, Cap 293
- Trespass Act, Cap 294
- Land Acquisition Act, Cap 295
- Rent Restriction Act, Cap 296
- Survey Act, Cap 299
- Registered Land Act, Cap 300
- Landlord and Tenants Act, Cap 301
- Land Control Act, Cap 302
- Land Planning Act, Cap 303
- Physical Planning Act of 1996 (No.6 of 1996) (since 29/10/1998)
- Mortgages (Special Provisions) Act, Cap 304

Water-related Statutes

- Main legislation: Water Act, 2002. Other legislation includes:
- Forests Act, 2005
 - Irrigation Act (Cap 347)
 - Fisheries (CAP 385)
 - National Water Conservation and Pipeline Corporation Order (Legal notice No, 270 of 1988)

Lakes and Rivers (CAP 409)
River Basin Development Authorities Act (Cap 443)\
Maritime Zone (Cap 371)
Malaria Prevention Act (Cap 246)
Agriculture Act (Cap 318)
Environmental Management and Coordination Act, 1999

Green Water Credits reports

GWC 1	<i>Basin identification</i>	Droogers P and others 2006
GWC 2	<i>Lessons learned from payments for environmental services</i>	Grieg-Gran M and others 2006
GWC 3	<i>Green and blue water resources and assessment of improved soil and water management scenarios using an integrated modelling framework.</i>	Kauffman JH and others 2007
GWC 4	<i>Quantifying water usage and demand in the Tana River basin: an analysis using the Water and Evaluation and Planning Tool (WEAP)</i>	Hoff H and others 2007
GWC 5	<i>Farmers' adoption of soil and water conservation: the potential role of payments for watershed services</i>	Porras I and others 2007
GWC 6	<i>Political, institutional and financial framework for Green Water Credits in Kenya</i>	Meijerink G and others 2007
GWC 7	<i>The spark has jumped the gap. Green Water Credits proof of concept</i>	Dent DL and JH Kauffman 2007