

Assessing the Roles of Water Resources Users Associations in line with the Principles of Integrated River Basin Management: Case Study of the Kuywa Water Resources Users Association

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Abstract: *Integrated River Basin Management (IRBM) has become a rallying call of mainstream thinking on water resources management across the world. The Dublin Principles (1992) and the Rio Conference's Agenda 21 (1992) all stressed aspects of water resources management that are supposed to be integrated at the river basin level. The World Bank Water Policy (1993) underscored that "in many countries, institutional reform will focus on river basins as the appropriate unit for analysis and coordinated water resources management." The European Union's Water Framework Directive (2000) enjoins all member states to "ensure the appropriate administrative arrangements, including the identification of the appropriate competent authority, for the application of the rules of this Directive within each river basin district lying within their territory." In Kenya, the Water Act 2016 recognizes the river basin as the planning unit for water resources management and establishes Water Resources Users Associations (WRUAs) as vehicles for conflict resolution and collaborative management of water resources at the basin level. The WRUA Development Cycle (WDC) which is the tool that guides formation of WRUAs and development of their Sub-Catchment Management Plans (SCMPs) but it does not provide clear guidelines to the WRUAs towards achieving Integrated River Basin Management within the entire basins. The objective of the research was to assess the extent to which the WRUAs are implementing Integrated River Basin Management through their planned and funded activities. The case study was the Kuywa WRUA operating in the Kuywa river sub-basin in western Kenya. The study found out that the WRUAs' activities were fully in line with the principles of Integrated River Basin Management, and that the WRUAs were having a major impact on the conservation of their sub-basins. However, lack of technical capacity and limited funding were the two major hindrances to the WRUA's efforts towards Integrated River Basin Management at the sub-basin level. Further, the research also established that a lack of coordination amongst WRUAs within the same basin was a major hindrance to achieving a basin-wide approach to Integrated River Basin Management.*

Keywords: Integrated River Basin Management, Kuywa Sub-basin, Kuywa Water Resources Users Association, River Basin Organization, Sub-Catchment Management Plans, Water Resources Management Authority, Nairobi, Kenya

1. Introduction

The Kuywa sub-basin falls under the Lake Victoria North Basin Area of the Water Resources Management Authority (WRMA). The WRMA Regional Office in Kakamega has overseen the establishment of the Kuywa Water Resources Users Association (KUWRUA) to spearhead water resources management and basin conservation for the Kuywa River sub-basin through involvement of the local communities and stakeholders. KUWRUA has already developed a Sub-Catchment Management Plan (SCMP) which has been under implementation since 2008. KUWRUA has fairly well established institutional structures and technical capacity in comparison with other WRUAs in the region. This, coupled with the high level of awareness of community members in the Kuywa sub-basin provides a good entry point for the proposed study on assessing the effectiveness of Water Resources Users Associations in implementing the Principles of Integrated River Basin Management.

2. Literature Review

Integrated River Basin Management

The Global Water Partnership (GWP) defines Integrated River Basin Management (IRBM) as "the process of coordinating conservation, management and development of

water, land and related resources across sectors within a given river basin, in order to maximize the economic and social benefits derived from water resources in an equitable manner while preserving and, where necessary, restoring freshwater ecosystems" (GWP, 2000).

In practice, IRBM brings together a diverse array of stakeholders in a river basin in a process to collaboratively manage the activities and impacts on water resource use. This participatory approach results in more holistic strategies, ensures more inclusive of the diversity of goals, and produces greater support and commitment from stakeholders, which increases the likelihood of implementation (Hooper, 2005).

Integrated River Basin Management has now become a rallying call of mainstream thinking on water resource management. The 1992 Dublin Principles and Rio Conference's Agenda 21 all stressed aspects of management that are supposed to be integrated at the river basin level. In the wake of the Conference, the 1993 World Bank water policy underscored that "in many countries, institutional reform will focus on river basins as the appropriate unit for analysis and coordinated management."

The European Union's Water Framework Directive (2000) represents probably the most ambitious attempt worldwide to reorder water resources management around the principle of river basin management (Moss, 2012). The Water Framework Directive enjoins all EU member states to "ensure the appropriate administrative arrangements, including the identification of the appropriate competent authority, for the application of the rules of this Directive within each river basin district lying within their territory" (WFD, 2000).

The establishment of the WFD was underpinned by a realization by the European members states that the "Waters in the Community are under increasing pressure from the continuous growth in demand for sufficient quantities of good quality water for all purposes," and therefore there was "need for action to protect Community waters in qualitative as well as in quantitative terms" (WFD, 2000).

The WFD states that the "objective of achieving good water status should be pursued for each river basin, so that measures in respect of surface water and ground waters belonging to the same ecological, hydrological and hydrogeological system are coordinated" (WFD, 2000). This, in essence, encapsulates the need for creation of a River Basin Organization that will spearhead the application of all the WFD's rules within the river basin district towards achievement and maintenance of its good water status.

Principles of Integrated River Basin Management

Bruce Hooper (2005) outlines the following as the key principles of IRBM;

- (i) Engaging all stakeholders to ensure that they own the process and participate under a formal, contractual arrangement, rather than ad hoc, voluntary arrangements.
- (ii) Accurate design and modeling of river basin management options while ensuring that relevant river basin decision-makers are involved throughout the process of model design, implementation and outcome review.
- (iii) Application of diverse institutional arrangements such as cost sharing programs, as well as regulatory practices such as environmental regulation, zoning laws and environmental standards for best practice. Developing countries require different approaches to institutional strengthening for river basin management than those of developed countries.
- (iv) Clear definition of the roles and jurisdiction of the RBO, which involves (a) a skills-based board of directors; (b) a democratic process, with its members elected by the regional community; and (c) accountability, with the management reporting to an independent board of directors linked to high levels of government for political influence and support.
- (v) Strong leadership that ensures strong river basin advocacy for successful river basin management. Strong river basin advocacy will ensure that both willing and stubborn resource managers are fully engaged, the case for IRBM is strongly articulated, conflicts are mediated and strong working relationships

are built between the many disparate and competing players in a river basin.

- (vi) There should be prioritization of actions, with some actions designed and implemented immediately to produce visible results in the short-term, as well as formulation of long-term River Basin Management Plans towards a cost-shared plan over a longer timeframe.
- (vii) Accountability: Need to monitor the effectiveness of a River Basin Management Plan and the organization responsible for its implementation. This should commence right at the launch of a River Basin Management Plan, with regular reports on the progress of river basin health in, for example, critical water quality indicators.
- (viii) Local government partnerships for effective implementation: There is continuing concern about the role and ability of local government to implement local forms of river basin management. Local government helps in planning and local zoning mechanisms which can be used to implement broader river basin management goals. Local Government powers should be harnessed within a River Basin Management Plan to enact IRBM, and implement it through sub-basin plans.
- (ix) Integrating functions for coordinated river basin management: One constant problem in IRBM is lack of coordination between and within government agencies, NGOs, the general public and other key local and regional water stakeholders. This can be solved through integration, coordination and planning mechanisms and driving coordination throughout the RBO and with its strategic stakeholders. The starting point to coordination is to establish a joint vision for the basin and an ethic of willingness to cooperate, coordinate and manage together.

The WWF Water Seminar Series (2001) highlights five key principles that can be described as 'cross cutting' because they apply globally to all aspects of the river basin management process;

- a) **Integration:** Integration between organizations, economic sectors and disciplines dealing with water resource management issues is required for ensuring efficient and effective river basin planning.
- b) **Scale:** The river basin is clearly recognized as the basic planning scale for water management measures. The great diversity in river basin sizes means approaches suitable to one location are not automatically transferable elsewhere, although the same basic planning principles must apply.
- c) **Timing:** Effective timing of implementation is critical, taking advantage of opportunities as they arise while working within a strategic framework. Deadlines for achieving the objectives of IRBM are extremely challenging. But they must not be seen as a step-by-step timetable for implementation as many tasks will effectively be required before such deadlines. Better start implementing early but imperfectly.
- d) **Participation:** Active participation by all relevant stakeholders in well-informed and transparent planning and decision-making is crucial to ensure that decisions are based on common understanding, shared

knowledge, experiences and scientific evidence. Access to information, consultation and participation of the public and stakeholders are key elements of the process of river basin planning.

- e) **Capacity:** Adequate investment of financial and human resources in capacity building for river basin planning and participation processes is a crucial to the success of the river basin management process.

Strategic River Basin Planning

Strategic Basin Planning is defined as “a coherent multidisciplinary approach to managing basin water resources and their users in order to identify and satisfy social, economic and environmental priorities” (Pegram et al, 2013). Thus the aim of Strategic River Basin Planning is to select a set of objectives, out of all possible water management objectives, that will best contribute to a range of competing economic, social and ecological goals. Further, achieving these goals requires the participation of a range of government bodies and stakeholders, beyond those directly involved with water management.

Characteristics of strategic basin planning include the following:

- (i) Trade-offs between alternative economic, social and environmental objectives, and between existing and potential future demands;
- (ii) A sophisticated approach to recognizing environmental water needs and the importance of aquatic ecosystem functioning in providing goods and services;
- (iii) Understanding basin interactions, including the range of hydrological, ecological, social and economic systems and activities at work within a basin;
- (iv) Robust scenario-based analysis to address uncertainty in future development and climate, by assessing alternative hydro-economic scenarios; and
- (v) Prioritization, to identify which of the many demands are the key needs for economic development, social justice and environmental protection.

Pegram et al (2013) have outlined “**Ten Golden Rules of Basin Planning**”, key issues that they reckon are central to the challenge of river basin planning. These are:

- (i) Develop a comprehensive understanding of the entire system;
- (ii) Plan and act, even without full knowledge;
- (iii) Prioritize issues for current attention, and adopt a phased and iterative approach to the achievement of long-term goals;
- (iv) Enable adaptation to changing circumstances;
- (v) Accept that basin planning is an inherently iterative and chaotic process;
- (vi) Develop relevant and consistent thematic plans;
- (vii) Address issues at the appropriate scale by nesting local plans under the basin plan;
- (viii) Engage stakeholders with a view to strengthening institutional relationships;
- (ix) Focus on implementation of the basin plan throughout; and
- (x) Select the planning approach and methods to suit the basin needs.

Strategic River Basin Planning also requires the development of River Basin Management Plans (RBMPs), which are a prerequisite for consistent implementation of policies, including the allocation of water resources, pollution abatement, zoning, granting of permissions and licenses, and others. The aim of a RBMP is to provide overall vision and guidance, by clearly outlining the priorities and balancing the various sector interests in a way that facilitates clear and specific actions to address the main issues. The RBMP should outline the objectives for sustainable management of the river basin and specify concrete short-term and long-term actions towards achieving these objectives. In Europe, River Basin Management Plans are a requirement of the Water Framework Directive, with each member state required to produce a plan for each of the river basin districts within its territory.

River Basin Organizations

River Basin Organization is a generic term used to refer to any institution that is directly involved in the management of river basins (Pegram et al, 2013). They may range from large formal basin-scale agencies down to small informal basin groups, and include trans-boundary commissions on international waters.

According to the Global Water Partnership’s IWRM Tool Box (Tool B1.4), River Basin Organizations (RBOs) are specialized organizations set up by political authorities, or in response to stakeholder demands, to deal with the water resource management issues in a river basin, a lake basin, or across an important aquifer. RBOs provide a mechanism for ensuring that land use and needs are reflected in water management and vice versa. Their functions vary from water allocation, resource management and planning, to educating basin communities and developing natural resources management strategies and programmes of remediation of degraded lands and waterway. The focus of the river basin organizations is to deal with land and water resources issues that are domestic and do not transcend state boundaries (GWP, 2000).

Many countries across the world have established River Basin Organizations, or are in the process of doing so. Although each country is unique, the challenges they face in river basin management generally have some similarities, and an examination of the experiences various countries would reveal important lessons that can be useful in working towards integrated river basin management in the Kenyan context.

Integrated Water Resources Management

The Global Water Partnership (GWP) defines IWRM as ‘a process that promotes the coordinated development and the management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems’ (GWP TAC Background Paper No. 4, 2000).

The concept of IWRM is driven by the recognition that the world’s fresh water resources are under increasing pressure resulting from growth in world population, leading to

increased competition over the limited freshwater resources. A combination of social inequity, economic marginalization and lack of poverty alleviation programmes also force people living in extreme poverty to over-exploit soil and forestry resources, which often results in negative impacts on water resources. Lack of pollution control measures further degrades water resources (GWP TAC Background Paper No. 4, 2000).

Principles of Integrated Water Resources Management

The Principles of Integrated Water Resources Management (also called the Dublin Principles), were formulated during the International Conference on Water and the Environment (ICWE) in Dublin, 1992, as a preparation for the UN Conference on Environment and Development (UNCED) in Rio de Janeiro the same year. The four Principles are:

- (i) Fresh water is a finite, vulnerable and essential resource which should be managed in an integrated manner;
- (ii) Water resources development and management should be based on a participatory approach, involving all relevant stakeholders;
- (iii) Women play a central role in the provision, management and safeguarding of water; and
- (iv) Water has an economic value and should be recognized as an economic good, taking into account affordability and equity criteria.

IWRM seeks to shift water resources development and management systems from their currently unsustainable forms, to more responsive forms that are capable of adapting to new economic, social and environmental conditions and to changing human values (GWP, 2000).

IWRM seeks to achieve the following key strategic objectives:

- Efficiency, the need to maximize the economic and social welfare derived not only from the water resources base but also from investments in water services provision;
- Equity in the allocation of scarce water resources across different economic and social groups in order to reduce conflict and promote socially sustainable development; and
- Environmental sustainability, as ultimately all attempts at water management reform will fail if the water resources base and associated ecosystems continue to be regarded as infinitely robust and we continue to put at risk 'the water system that we depend on for our survival' (WWC, 2000).

Integrated Water Resources Management in Kenya

In Kenya, the Water Act 2016 recognizes the river basin as the planning unit for water resources management in the entire country. Section 14 (1) of the Water Act 2016 empowers WRMA to "designate a defined area from which rainwater flows into a watercourse to be a basin area" (Water Act 2016). In accordance with this provision, WRMA has designated six main basin areas in the entire country which are based on existing drainage basins. These are: Lake Victoria North, Lake Victoria South, Rift Valley, Athi, Tana and Ewaso Ng'iro North Basin Areas.

WRMA has established six regional offices based on these basin areas, and has, in accordance with the provisions of the Water Act 2016, established Basin Water Resources Committees (BWRCs), which serve to advise the WRMA Regional Offices and the County Governments, concerning (a) conservation, use and apportionment of water resources; (b) the grant, adjustment, cancellation or variation of any permit; (c) annual reporting to the water resources users on water issues and their performance within the basin area; (d) collection of data, analyzing and managing the information system on water resources; (e) review of the basin area water resources management strategy; (f) facilitation of the establishment and operations of water resource user associations; (g) flood mitigation activities; (h) information sharing between the basin area and WRMA Regional office; (i) equitable water sharing within the basin area through water allocation plans; and (j) any other matter related to the proper management of water resources (Water Act 2016).

The Water Act 2016 empowers WRMA to formulate a Basin Area Water Resources Management Strategy for the management, use, development conservation, protection and control of water resource within each of the established basin areas (Water Act 2016). The Act also establishes WRUAs as vehicles for collaborative management of water resources and resolution of conflicts concerning the use of water resources at the sub-basin level. The WRUAs' key mandate is to enhance participation of the local community and stakeholders in water resources management, to ensure not only sustainable and equitable use of the available resource in view of the various competing demands, but also basin conservation through implementation of various conservation activities.

Integrated Water Resources Management at the Basin Level

International discourse on IWRM has generally come to a consensus that the river basin represents the most logical, practical unit for integrated water resources management (GWP, 2000); (Butterworth et al, 2010); (Saravanan et al, 2009). GWP defines IWRM at the basin level, as a "process that enables the co-ordinated management of water, land and related resources within the limits of a basin so as to optimize and equitably share the resulting socio-economic well-being without compromising the long-term health of vital ecosystems" (GWP and INBO, 2009).

The GWP and the INBO have developed a handbook (*A Handbook for Integrated Water Resources Management in Basins*) which provides guidance for improving the governance of freshwater resources through implementation of IWRM. The handbook provides guidance for integrated water resources management that can be applied in basins regardless of the context (developed or developing countries, humid or arid conditions) or the current state of water governance. The handbook outlines the critical issues in integrated basin management including need for political goodwill, appropriate policies and legislation, an enabling environment, institutional arrangements (roles and responsibilities), and sound management mechanisms (GWP and INBO, 2009).

Kenya Water Sector's Policy, Legal and Institutional Framework

(i) Draft National Water Policy 2013

The enactment of the new Constitution of Kenya 2010 necessitated the revision of the National Water Policy of 1999, resulting in the Draft National Water Policy 2013. The Draft NWP 2013 is informed by the gains made (and the challenges faced) during the implementation of reforms in the water sector anchored on the National Water Policy of 1999, the Water Act 2002, and the IWRM Principles adopted during the UNCED conference in Rio de Janeiro. The Draft NWP 2013 takes into account provisions of the new Constitution of Kenya 2010, the aspirations of Kenya's Vision 2030; the Sustainable Development Goals (SDGs), and other National Policies and Strategies. The Draft NWP 2013 provided for the development of the new Water Act 2016, which replaced the Water Act 2002.

The Draft NWP 2013 has outlined, as one of its policy objectives, the need to "to ensure a comprehensive framework for promoting optimal, sustainable, and equitable development and use of water resources for livelihoods of Kenyans." Under this objective, the following policy statements are envisaged:

- (i) Ensure provision of clean and safe water sources in adequate quantities for every person in Kenya above the international benchmark of 1,000 m³ by the year 2030;
- (ii) Ensure availability of the reserve flow for maintenance of progressive restoration and protection of ecological systems and biodiversity in strategic water basins;
- (iii) Enable inter-basin water transfer in Kenya as a strategic intervention for efficient and equitable allocation of water resources;
- (iv) Enforce pollution control;
- (v) Establish sound research and development in the water sector;
- (vi) Establish monopolistic and unified regulatory function of water resources at regional and National level;
- (vii) Ensure sustainable groundwater resources for present and future generations;
- (viii) Sufficient funds for sustainable development and management of water resources;
- (ix) Resolve conflicting mandates by better cross-sectoral coordination; and
- (x) Develop a water management system which contributes to the protection of the environment.

(ii) The Water Act 2002

The Water Act 2002 introduced key reforms in the institutional framework for management of the water sector in Kenya. These key reforms included, amongst others:

- a) Separation of water resources management from water supply services provision;
- b) Separation of policy making from day to day administration and regulation;
- c) Decentralization of operational functions to lower level state organs; and

- d) Involvement of non-government entities and communities in water resources management and provision of water supply and sanitation services.

The Ministry of Water and Irrigation (MWI) was vested with the responsibility for overall sector oversight including policy formulation, coordination and resource mobilization, with new semi-autonomous institutions being established to handle water resources management and water service provision in the country. The objective was to ensure better management of water resources and equitable allocation towards the various competing uses.

(iii) The Water Act 2016

The Water Act of Kenya 2016 was enacted in September 2016, replacing the Water Act of Kenya 2002. Some of the notable deviations of the new Water Act 2016, from the old Water Act 2002 include the following:

- Establishment of the Water Resources Authority instead of the Water Resources Management Authority;
- Adoption of Basin Areas instead of Catchment Areas;
- Basin Area Water Resources Management Strategy replacing Catchment Management Strategy;
- Basin Water Resources Committee replacing the Catchment Area Advisory Committees;
- National Water Harvesting and Storage Authority replace the National Water Conservation and Pipeline Corporation;
- Water Works Development Agencies replacing the Water Services Boards;
- Establishment of the Water Tribunal in place of the Water Appeal Board;
- Transformation of the Water Services Trust Fund into the Water Sector Trust Fund;
- Recognition of trans-boundary waters in classifying water resources for the purpose of determining water resources quality objectives; and
- The new Act also introduces the concept of sector wide approach aimed at achieving "coordinated development in the water sector to achieve national goals, including sector wide planning and coordination."

The Water Act 2016 also seeks to align itself with the provisions of the Constitution of Kenya 2010, including the following, amongst others:

- That every person in Kenyan has the right to clean and safe water in adequate quantities and to reasonable standards of sanitation, as stipulated in Article 43 of the Constitution;
- Recognition of the Salaries and Remuneration Commission, as established under Article 230 of the Constitution of Kenya 2010, as the constitutional authority to advise on salaries and remuneration of public servants;
- Recognition of the development of water resources (and national public works) as a function of the national government and water supply and sewerage service provision as a function of the county government, and formulation of mechanisms towards achievement of the same;
- Recognition of the role of the Equalization Fund, as established under Article 204 of the Constitution of Kenya 2010, in financing the development and

management of water and sewerage services in all the counties in Kenya.

Water Resources Management in Kenya

(i) Water Resources Management Authority

In Kenya, the Water Resources Management Authority (WRMA) is the national body responsible for managing, protecting, apportioning and conserving Kenya's water resources, including trans-boundary waters. The Water Act 2016 outlines the functions of WRMA as being:

- (i) To formulate and enforce standards, procedures and regulations for the management and use of water resources and flood mitigation;
- (ii) To receive water permit applications for water abstraction, water use and recharge and determine, issue, vary water permits; and enforce the conditions of those permits;
- (iii) To collect water permit fees and water use charges;
- (iv) To determine and set permit and water use fees;
- (v) To advice to the Cabinet Secretary for formulation of policy on national water resource management, water storage and flood control strategies; and
- (vi) To coordinate with other regional, national and international bodies for the better regulation of the management and use of water resources.

The Water Act 2016 provides for decentralized water resources management and stakeholder involvement, which should be implemented through WRMA's regional offices. The Authority has six regional offices, which are based on basin areas as follows:

- Lake Victoria North Basin;
- Lake Victoria South Basin;
- Rift Valley Basin;
- Athi Basin;
- Tana Basin; and
- Ewaso Ng'iro North Basin.

The regional offices have the mandate to manage the water resources in their basin areas while the WRMA head office is mandated to provide overall supervision and policy guidance.

(ii) Basin Water Resources Committees

Each of WRMA's six regional offices is supported in performance of their functions through the Basin Water Resources Committees (BWRCs), whose membership is drawn from representatives of various groups in the basin area such as pastoralists, farmers, business community, water NGOs, Government Agencies, Local Authorities, Regional Development Authorities, Water Users Associations, etc. (Water Act 2016). The BWRCs' responsibilities include advising the WRMA regional offices on water resources conservation, use and apportionment; the grant, adjustment, cancellation or variation of any permit; and; any other matters pertinent to the proper management of water resources (Water Act 2016). The BWRCs also work in close collaboration with the WRMA's sub-regional offices and the WRUAs.

(iii) Water Resources Users Associations

The WRMA Rules (2007) define a WRUA as "an association of water users, riparian land owners, or other stakeholders who have formally and voluntarily associated for the purposes of cooperatively sharing, managing and conserving a common water resource."

The Water Resource Users Association is a model for community based participation in water resources management. The model is based on the following premise:

- (i) The water resources users, being the principle beneficiaries or direct stakeholders of the water resources, should be integrally involved in the management of the water resources;
- (ii) Since their livelihood depends on the water resources and is at stake, the water resource users can be mobilized to undertake water resources management activities that serve their best interest (e.g. surveillance on illegal activities, adoption of best land use practices, basin area management activities, etc.); and
- (iii) It is more efficient (with respect to the WRMA) for the WRUA to mobilize the water users to solve problems at the grassroots level (WRMA, 2008).

WRUAs operate at the lowest basin level where they provide opportunity for active participation of local communities and local water stakeholders in decision making regarding water resources management, basin area conservation and other water-related issues. WRUAs work closely with the BWRCs in their region in providing support to WRMA's regional offices as they carry out their mandate.

Objectives of WRUAs include (WRMA, 2008);

- Promote controlled and legal water use activities;
- Promote good management practices which make efficient and sustainable use of the water resources;
- Safeguard the reserve flows for downstream ecological demands and basic human requirements;
- Promote water conservation practices to ensure sufficient water reserves that meet the demands of the environment, the wildlife, the livestock and all the communities;
- Reduce and solve water use conflicts;
- Increase the usage of the water for economic and social improvements; and
- Develop sustainable and responsive institutions for water resources management.

(iv) National Water Resources Management Strategy

The National Water Resources Management Strategy (NWRMS) is developed by WRMA to guide its implementation of water resources management activities on a national level. The NWRMS has the following specific objectives: to improve equal access to water resources for all Kenyans; to promote integrated water resources planning and management at basin level; and to enhance the availability of water resources of a suitable quality and quantity.

The Water Act 2016 provides that the NWRMS "shall prescribe the principles, objectives, procedures and institutional arrangements for management, protection, use, development, conservation and control of water resources and, in particular, for: (a) determining the requirements of

the reserve for each water resource; (b) classifying water resources in accordance with this Part; and (c) identifying areas which, in accordance with this Act, should be designated protected areas and ground water conservation areas.”

(v) Basin Area Water Resources Management Strategies

WRMA has a responsibility to formulate a Basin Area Water Resources Management Strategy (BAWRMS) for each of its six designated basin areas in Kenya. The BAWRMS provides guidance to WRMA regional offices in the management, use, development, conservation, protection and control of water resources within their basin areas. The objective of the BAWRMS is to provide strategy and guidelines for achieving the outlined water resources management objectives, including providing guidelines on the following issues:

- (iv) Determination of basin area management units and classification of water resources in each management unit;
- (v) Setting the Resource Quality Objectives (RQOs) and measures to achieve the RQOs;
- (vi) Water balance and water demand management;
- (vii) Water allocation and water use management;
- (viii) Water resource protection and reserve management;
- (ix) Basin area protection and riparian conservation;
- (x) Institutional development support including WRUAs formation and SCPMs development;
- (xi) Water infrastructure development for surface and ground water storage, flood mitigation, etc.;
- (xii) Rights Based Approach (RBA)/ Poverty Reduction in water resources management;
- (xiii) Monitoring networks and water resources information management systems (WRIMS); and
- (xiv) Strategies for BAWRMS financing and implementation.

(vi) Water Resources Users Association Development Cycle

Formation of WRUAs and development of SCMPs in Kenya is guided by the Water Resources Users Associations Development Cycle (WDC), developed by WRMA in conjunction with WSTF. The WDC process provides technical guidelines and financial support for formation of WRUAs and for development of Sub-Catchment Management Plans (SCMPs).

Sub-Catchment Management Plans

The Sub-Catchment Management Plans (SCMPs) are developed at the sub-basin level which is the lowest level in the water resources management hierarchical system in Kenya. Objectives of a SCMP may include but not limited to the following;

- a) Providing the WRUA members with a prioritized plan of action & budget for their planned activities in water resources management and basin area conservation;
- b) Helps document crucial information regarding the sub-basin, including information on the available water resources versus the demand etc.
- c) Provides a basis for development of proposals for seeking funding;

- d) Provides clarifications of roles amongst stakeholders in support of common objectives; and
- e) Identifies key issues, problems, priorities and enumerates the required interventions.

The WDC and the IWRM Concept in Kenya

The WDC framework is based on the Integrated Water Resources Management (IWRM) approach that adopts a holistic view of the water resources, incorporating social, environmental and economic aspects of the water resources. IWRM recognizes that basin conservation and water resource management is a long term process that requires continuous participation by many stakeholders involving different kinds of interventions. WDC has therefore been designed to foster a long term relationship between WRMA and the WRUAs to continuously build WRUA capacity to implement IWRM activities.

IWRM champions for the need to balance the available water resources with the multiple users and their competing demands, objectives and perspectives, and underscores the need for continuous stakeholder participation in all issues related to water resources management in any given basin. WDC also emphasizes the need for Rights Based Approach (RBA) in water resources management, which takes the view that proactive steps must be taken to help disadvantaged groups to engage in water resources management so that their voice might be heard and their needs addressed.

The WDC provides guidelines for development of Sub-Catchment Management Plan (SCMP), which sets out a plan of activities to address the water resources management problems faced in the particular sub-basin, including a budget thereof, which is then submitted to the WSTF for funding. Funds channeled through WRUAs are used for capacity building of WRUAs, development of water resources infrastructure and Implementation of Sub-Catchment

The WRUA formation process is coordinated by the WRMA regional and sub-regional offices. The concept of WRUA formation was operationalized in 2005 (WRMA, 2011).

The WDC and the Principles Integrated River Basin Management

The WDC document outlines various IWRM concepts that guide the development of SCMPs for WRUAs in Kenya. However, a review of the WDC document reveals that these IWRM concepts are also consistent with the internationally accepted principles of integrated river basin management (IRBM) as discussed earlier in this Chapter. The WDC's IWRM concepts include but not limited to the following (WRMA, 2008):

- Integration of basin, riparian and water resources;
- Scale (basin as a planning unit);
- Participatory approaches (stakeholder involvement);
- Coordination with other sectors;
- Monitoring and evaluation;
- Capacity building;
- Prioritization;

- Institutional development and collaboration;
- Sustainability/ cost effectiveness; and
- Rights based approach (RBA).

Thus it can be said that although the WDC document has no mention of IRBM, its concepts which are anchored on the IWRM principles, are also quite consistent with the internationally accepted principles of IRBM. A detailed assessment of the WRUAs' activities could help to establish to what extent these IWRM concepts being implemented by WRUA's through their SCMPs are consistent with the IRBM Principles.

Status of WRUA Formation in Kenya

As per the WRMA Performance Report 4 (WRMA, 2015), the estimated potential number of WRUAs to be established in the whole country is 1,868. As at June 2014, only 571 out of the potential 1,868 WRUAs had been established, about 31% of the total potential. A total of 320 out of the 571 established WRUAs had developed their SCMPs, representing 56% of the total potential. Thus a lot still needs to be done in terms of setting up the requisite institutional structures for effective water resources management and basin conservation in Kenya.

Table 1 shows the status of WRUA formation and SCMP development in Kenya as at June 2014.

Table 1: Status of WRUA formation and SCMP development in Kenya

Region	WRUAs Up to June 2014			SCMPs up to June 2014		
	Potential	Achieved	Proportion (%)	Potential	Achieved	Proportion (%)
LVN	106	99	93	106	92	87
LVS	137	98	72	137	85	62
RV	175	68	39	175	52	30
Tana	240	121	50	240	147	61
Athi	309	121	39	309	159	51
ENN	901	73	8	901	63	7
Total	1868	571	31	1868	320	17

Source: WRMA Performance Report 4 (March 2015)

Some Key Challenges Facing Water Resources Management in Kenya

(i) Capacity of WRUAs for Water Governance in Kenya

The Water Governance Centre (WGC), a CSO from Netherlands with operations here in Kenya, carried out a capacity assessment on water governance for two WRUAs in the Lake Naivasha basin, namely LANAWRUA and Mkungi Kitiri WRUA. The capacity assessment was carried out with the help of a WRUA Capacity Assessment Tool which was developed as part of the Integrated Water Resource Action Plan Program (IWRAP) that is funded by the Governments of United Kingdom of the Netherlands. The Capacity Assessment Tool is a flexible methodology to score organisational capacity of WRUAs, along a number of defined indicators, with clearly described standards for four stages of organisational development, i.e. Stage 1, Stage 2, Stage 3 and Stage 4. Stage 1 is the lowest level of development while Stage 4 is the highest (WGC, 2015).

The Capacity Assessment Tool assesses the water governance capacity of the WRUAs comprising of three inter-related layers, as follows (WGC, 2015):

1. a content layer (water management policies, knowledge and skills in water management, information management);
2. an institutional layer (the organizational framework, legislation and legal instruments and the financing structure); and
3. a relational layer (communication and cooperation between different actors and with the public, stakeholder participation, transparency, ethics, culture, values and trust).

The Capacity Assessment Tool aims at achieving the following objectives (WGC, 2015):

- (i) For the WRUA to self-assess and understand where the WRUA stands, in terms of organisational capacity, how strong it is and where its strengths and weaknesses are. It can thus help in determining, what the WRUA can be expected to be able to do or not. This requires an honest and open scoring process that is meant for learning, not for punishment;
- (ii) For the WRUA and support agencies to have a needs assessment how and in what areas the WRUA can be further strengthened. This requires an action plan for follow-up;
- (iii) As a baseline and subsequent monitoring tool to assess whether capacity is indeed increasing over time, as a result of organisational change, training and inputs provided. This requires regular update of the exercise;
- (iv) To create a shared awareness, understanding and agreement among key stakeholders about the WRUA and about actions to be taken to strengthen it. As a self-assessment, it provides a platform for exchange of viewpoints and opinions to create a common vision. This does require a workshop environment in which scores and findings are discussed to come to a common agreement on the level of development; and
- (v) As a learning tool to increase knowledge about governance and management of an organisation, through the explanation of the standards of different levels of development.

As per the outcome of the capacity assessment, both the LANAWRUA and Mkungi Kitiri WRUA were ranked between the seedling and maturing stage of development in terms of their water governance capacity, i.e. between stages two and three of development (WGC, 2015).

This shows that a lot still needs to be done in order to bring the WRUAs' water governance capacity to Stage 4 of development.

The following were some of the indicators that were recommended to be prioritized in order to grow the WRUAs' water governance capacity:

- (i) Organisational skills;
- (ii) Local community/member financial contribution;
- (iii) Funding model, other external financial resource mobilisation and diversification of funds;
- (iv) Monitoring and communication of output and outcomes as an organisation;
- (v) Links and cooperation with government agencies;

- (vi) Information management; and
- (vii) Financial planning, budgeting, monitoring and administration.

(ii) Lack of Coordination in the Kenyan Water Sector

The Integrated Water Resources Management and Water Efficiency Plan for Kenya (WRMA, 2009) noted that there was a lack of proper inter-linkages with other water related key sectors of the economy such as agriculture, industry and tourism and social issues such as health, education and poverty which was not evident during the formulation of the national water policy of 1999.

The IRWM&WEP notes the importance of overall coordination in the water sector between the GoK and other stakeholders including private sector, NGOs, CBOs, etc., which at the time was taking place though the Water Sector Working Group (WSWG) (IWRM&WEP, 2009).

There was also the Water Sector Technical Group (WSTG) which was formed to improve co-ordination and harmonization among the development partners on one side, and the government agencies and NGOs on the other side, which is still an active forum that is in operation to date (AWSCR, 2015).

The 9th Annual Water Sector Conference in Kenya (April 2015) noted that there was need for transparency and predictability of planning and budgeting in the water sector between the two levels of government – national and county – noting that poor information flow was “the weakest link in the water sector.” The Conference routed for development of a national framework to facilitate cooperation between all stakeholders – national government, county governments, development partners, non-state actors, water sector institutions, and the private sector (AWSCR, 2015).

(iii) Lack of Investment in Water Resources Management

Recent trends in the water sector in Kenya has seen the government invest heavily in water supply in its effort to achieve its target of water supply coverage countrywide (WSSP, 2009). This has resulted in less investment in water resources management compared to water supply. Government’s budgetary allocations as well as donor funding has traditionally gone more towards improving water supply coverage than towards developing systems for integrated water resources management. Although there has been improvement in the recent years with the government investing more in development of water resources infrastructure such as dams, the overall national investment in water resources management still falls short.

During the 9th Annual Water Sector Conference in Kenya, held at Safari Park Hotel, Nairobi in April 2015, the participants noted that the water sector in Kenya “suffers from huge budget deficits and as a result the sector may not be able to realize its goals by 2030 as set out in the Water Master Plan and Vision 2030.” In order to address this problem, at least two options were discussed during the Conference: resort to public/private partnerships, and the establishment of a water sector financing authority or a

“benki ya maji”. Borrowing lessons from Colombia, Philippines and India, the water sector financing authority would essentially operate like a bank; it will issue long-term bonds (20-30 years) and the funds collected will be invested in the water sector (AWSCR, 2015).

The Water Resources Sector Memorandum (World Bank, 2004) noted that the multi-sectoral nature of water resources meant that water resources management had been everyone's concern but no-one's business. The memorandum recommended that the government ensures water resources management becomes everyone's business, by amongst others, developing an environment that promotes investment in water resources infrastructure development and management; and devolving responsibility for water resources management, as far as possible, to regional and local groups, including the private sector.

(iv) Lack of Basin-Wide Coordination amongst Water Users

One of the challenges facing WRMA in its quest towards integrated river basin management has been lack of coordination amongst the various WRUAs working within a larger river basin. Some of the larger river basins such as the Tana, Nzoia, Athi, etc, could have as many as 100 WRUAs operating within the same basin. Thus there is need for coordination of the activities that each of them carry out to ensure there is synergy and harmonise so that the ineffectiveness of one does not hamper the good efforts of the others.

The 9th Annual Water Sector Conference in Kenya (April 2015) noted the existence of this challenge and recommended for establishment a forum for engagement of upstream and downstream water users (AWSCR, 2015).

In their published document “*WRMA’s Framework for Engaging County Governments*” WRMA pledges to provide crucial water resources information to the County Governments that are sharing a common River Basin or aquifer, in order to enable harmonious resource management and development. The Authority also promises to facilitate information dissemination through the basin management forums where the County Governments sharing a common water body will be members (WRMA, 2013).

WRMA has recently introduced a concept of basin forums where all the WRUAs operating within the same basin meet together every once a year to discuss issues affecting the basin, and to exchange ideas on workable conservation mechanisms. This concept has already kicked off the Rift Valley Basin area in March 2016, while the Lake Victoria North Basin Area forum is scheduled to kick later this year (WRMA, 2016).

3. Review of the Case Study Area

(i) Location of the Kuywa Sub-basin Area

The study shall be carried out in the Kuywa River sub-basin, which is a tributary of the Nzoia River that flows from Cherangani hills to the Lake Victoria. The Kuywa River sub-

basin is bounded by latitudes 0° 25'24" N and 0° 49'40" N and longitudes 34° 35'53" E and 34° 45'32" E (Nyakora and Ngaira, 2014).

The Kuywa sub-basin is sub-divided into three zones; upper, middle and lower Kuywa, also called Kuywa 'A', Kuywa 'B' and Kuywa 'C'. Kuywa 'A' lies between Mpakani and the confluence of Kibisi and Kuywa rivers. Kuywa 'B' lies between the Kibisi-Kuywa confluence and the Matisi bridge along Webuye-Bungoma Road. Kuywa 'C' lies between the Matisi bridge and Khalala area where the Kuywa river enters the Nzoia river (KUWRUA, 2008).

The entire Kuywa River is about 96km long, originating from Mt. Elgon and draining into River Nzoia at Khalala. The River passes through six main business centres; Kapkateny, Nandolia, Kuywa, Chebukaka, Bokoli and Matisi and several coffee factories and the Nzoia Sugar Company. Two water intakes are located on the Kuywa River; at Kapsambu for the Kibichori-Bokoli water supply system; and at Matisi for Webuye-Bungoma water supply, which is administered by Nzoia Water and Sewerage Company Ltd (NZOWASCO). Figure 1 shows the map of the Kuywa River wsub-basin (Kisaka, 2014).

(ii) Topography and Climate

The altitude ranges from 1637m.a.s.l at the edge of Mt. Elgon Forest to 1505m.a.s.l at the confluence with the Nzoia River (WRMA, 2011). The area slopes southwards, with the upper parts consisting of steep slopes but the middle and lower section have gentle slopes. The rainfall pattern in the sub-basin is bimodal, with the long rains season experienced from March to June, the short rains season from September to November and the dry spell from December to February. The long rains season is from March to June, with mean annual rainfall of about 1800mm, while the dry season is from December to February with mean annual rainfall of about 250mm. The long rains season coincides with the highest flows in the river, up to a maximum of 17 cubic meters per second at the Matisi RGS. The temperatures range from a maximum of 30°C during day time to a low of 15°C at night (WRMA, 2010).

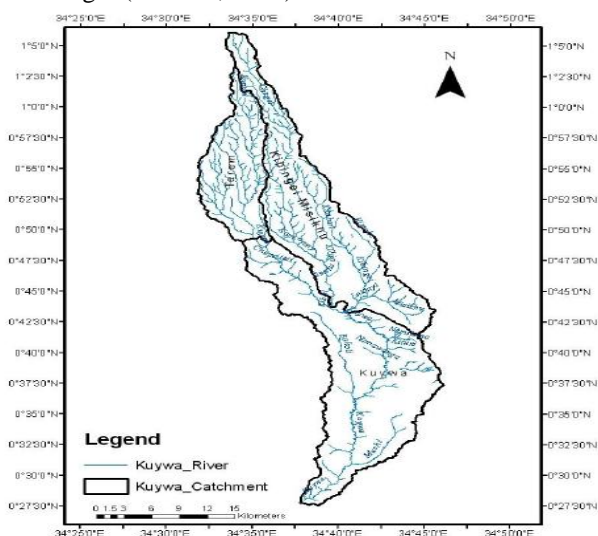


Figure 1: The Kuywa Sub-basin area

Source: Kisaka, 2014

(iii) Population Distribution

The population of Kuywa sub-basin was estimated at 241,422 people based on the 2009 population and housing and census (KNBS, 2010). The main ethnic groups in the sub-basin consist of Sabaot, Dorobo and Bukusu (a sub-tribe of the Luhya ethnic group).

Table 2 shows the population distribution within the Kuywa sub-basin.

Table 2: Population Distribution in Kuywa sub-basin

No.	Location	Population (2009)	Area (Km ²)	Density
1	Mukuyuni	23,710	40.4	587
2	Misikhu	42,295	70.1	684
3	Bokoli	32,891	68.9	477
4	Sitikho	30,055	80.1	375
5	East Bukusu	65,411	125.1	523
6	Bukembe	47,060	87.1	540
7	Total	241,422	471.7	512

Source: KNBS (2010)

(iv) Challenges Identified in the Kuywa Sub-basin

The Kuywa Water Resources Users Association (KUWRUA) has developed a Sub-Catchment Management Plan (SCMP) which has been under implementation since 2008. The following were the challenges identified in the Kuywa sub-basin during data collection for SCMP development (KUWRUA, 2008):

- (i) Water pollution due to washing, bathing and watering of animals directly in the river, sewage from institutions, foul water from coffee factories, and dumping of solid wastes near the water courses;
- (ii) Inappropriate solid waste disposal in market and town centers;
- (iii) Inefficient irrigation practices;
- (iv) Encroachment on and drainage of wetlands;
- (v) Clearance of indigenous trees cover and other forested areas for farming and for settlements due to rapid population growth in the sub-basin;
- (vi) Encroachment on basin areas;
- (vii) Inappropriate use of agro-chemicals in wetlands to plant sugarcane;
- (viii) Introduction of Eucalyptus species at water sources;
- (ix) Soil erosion on the farms, footpaths, and roadsides;
- (x) High sediment loads in the river during the high rainfall seasons, as a result of soil erosion upstream;
- (xi) Water accessibility in some areas;
- (xii) Inadequate water resource information (water quality, quantity, rainfall data, water use, sediment load);
- (xiii) Poor sanitation;
- (xiv) Overgrazing of livestock; and
- (xv) Human and wildlife conflicts.

Figure 2 shows high sediment load during the rainy season, as a result of soil erosion upstream.



Figure 2: High Sediment Load in the Kuywa River
Source: Nile Basin Initiative (2009)

(v) Review of the Kuywa WRUA's SCMP

The magnitude of the above stated challenges led to increasing poverty and food insecurity among community members, deteriorating environmental conditions and diminishing natural resources, particularly water, soil, and wood products in the basin. These challenges informed the KUWRUA's decision to prioritize appropriate water resource management as their core agenda in the management of the Kuywa sub-basin (KUWRUA, 2008).

The objectives of the KUWRUA SCMP are as follows:

- (i) To improve the quality of water resources by controlling and managing sources of pollution;
- (ii) To reduce conflicts over water arising from illegal water abstractions and over-abstraction for irrigation, by enforcing rules on water abstraction and promoting efficient irrigation practices;
- (iii) To conserve and manage the water resources in the basin by protecting and rehabilitating water sources such as springs, wetlands and other degraded areas;
- (iv) To discourage planting of high water consuming trees at water sources and support the re-introduction of indigenous trees in the basin;
- (v) To minimize soil erosion through soil conservation measures; and
- (vi) Encourage the use of water for economic gain.

The Kuywa WRUA has carried out a number of activities as required by the WDC framework, which have been included in its Sub-Catchment Management Plan. These include:

- (i) Description of the sub-basin's characteristics including the sub-basin's topographical, climatic, geological and socio-economic characteristics;
- (ii) List of water abstractors and the amount abstracted per day;
- (iii) List of water polluters;
- (iv) Detailed situational analysis showing existing challenges in the sub-basin;
- (v) Proposed management (intervention) measures; and
- (vi) Proposed budget for the prioritized intervention options.

Field Data Collection Tools

Data from the field was collected through semi-structured questionnaires administered to a sample of the population; through focus group discussions with the WRUA management committee; through key informant interviews

with officials from WRMA Regional Office, WRMA National Office and WSTF; through field observations from transect walks; and through collection of secondary data on the study area from government offices and from the WRUA officials in the study area.

The proposed tools for data collection from the field are outlined below:

(i) Semi-structured household survey questionnaires

These were specifically developed to obtain the demographic and socio-economic situation of the WRUA members being interviewed. An understanding of the demographics of the people being interviewed will help to provide background on the results of the survey, and shed light on some of their responses regarding sub-basin conservation issues. For instance, understanding their key source of income, if it is dependent on water resources, will help the researcher to understand why they have keen interest on water resources management issues.

(ii) Focus group discussion guide

The focus group discussion guide was used to guide a discussion with members of the Kuywa WRUA central management committee, to have an understanding of the background information about the WRUA, their involvement in the SCMP development, their implementation of the funded activities, the challenges faced and lessons learned.

(iii) Key informant interview guides

These were used for guiding interviews with officials from WRMA regional and national offices in charge of community development, as well as with the WSTF officers in charge of water resources investment.

(iv) Field observations checklist for transect walks

A transect walk is a tool for describing and showing the location and distribution of natural resources, physical features, changes in vegetation cover, cropping systems, landscape, main land uses, etc., along a given transect. It is useful in identifying and explaining the cause and effect relationships among topography, soils, natural vegetation, cultivation, and other production activities and human settlement patterns, identifying major challenges and problems affecting the sub-basin, and for triangulating data collected through other tools. (Source: Fauna & Flora International, 2013)

A field observation checklist outlines all the crucial information that the researcher aims to collect during the transect walk, to ensure that no important aspect is missed out. Usually the researcher is accompanied by one or more members of the WRUA who are conversant with the issues in the sub-basin so that they issues are pointed out as they walk through.

(v) Field Photographs

Field photographs were used to capture important physical features that the researcher observed during the transect walks. Use of photographs helped to corroborate the information gathered through other tools such as household surveys, focus group discussions and key informant

interviews. Photographs also help to clarify some aspects of the report, as can be seen in several sections of chapter 4 of this report. Field photographs were taken using a high resolution and high optical zoom digital camera which could still capture distant features with sufficient clarity to enable review.

(vi) Collection and review of secondary data, records and documents

Secondary data collected included records of the WRUA's financial transactions, the WRUA's constitution, by-laws, membership lists, SCMPs, and other relevant documents from WRMA and WSTF which would enhance the outcomes of the research. Literature for review was collected from the internet, the university library, the WRMA and other government agencies websites, from individual researchers etc.

(vii) Population and Sample Size

The study population comprised all the members of the Kuywa WRUA, the WRUA Management Committee, the staff from WRMA regional office in Kakamega and from the Kitale sub-regional office, and also the relevant WSTF staff. The Kuywa WRUA (KUWRUA) was selected for this study since it has well established and functioning WRUA structures, it has developed a responsive participatory SCMP and is among the WRUAs that have received funds from WRMA/WSTF towards implementation of the SCMP proposals. The sampling population for semi-structured questionnaires was all the registered members of the Kuywa WRUA as reflected in the official WRUA membership registers.

The initial sample size (without applying the finite proportion correction factor) can be determined using the following formula (www.qualtrics.com):

$$n_0 = \frac{Z^2 p(1-p)}{e^2}$$

n_0 is sample size for infinite population;
 Z is the Z-score value obtained from the charts;
 p is the percentage proportion of the sample;
 e is the confidence interval or margin of error.

The selected confidence level was 95% with a confidence interval (margin of error) of 10%. The selected percentage proportion was 0.5, which gives the maximum possible sample size. The Z-score value was determined from the Z-score charts, which is 1.96 for a 95% confidence level. Applying the finite proportion correction factor, we obtain the actual sample size n , from the finite population, N , using the following formula (www.qualtrics.com):

$$n = \frac{n_0 N}{n_0 + (N - 1)}$$

Kuywa sub-basin is divided into three zones, i.e. Upper Kuywa (Zone A), Middle Kuywa (Zone B) and Lower Kuywa (Zone C). The total number of registered members for each zone as per the lists provided by WRUA management teams was as shown in Table 3, with the full membership lists attached in the annexes to this report.

Table 3: Number of Registered Members in Kuywa WRUA and the Sample Size

No.	Kuywa Zone	Registered Members	Sample Size
1	Zone A	118	25
2	Zone B	82	23
3	Zone C	104	24
4	Total	304	72

Based on the above formulas, and given the total number of registered WRUA members, the sample size was calculated as follows:

The initial sample size for infinite population, n_0 is determined using formula (1) above, where;
 Z is the Z-score value obtained from the charts; =1.96
 p is the percentage proportion of the sample; =0.5
 e is the confidence interval or margin of error; = 0.1

$$n_0 = \frac{1.96^2 \times 0.5(1-0.5)}{0.1^2} = 96$$

The actual (corrected) sample size n , is determined using formula (2) above, where;

N is the finite population provided from the field; =304

$$n = \frac{96 \times 304}{96 + 303}$$

$$n = 73$$

Thus, a sample size of 72 members of the Kuywa WRUA was selected, through systematic random sampling method, to which the research questionnaires were administered.

Sampling Methodology

The Kuywa sub-basin area has been divided into three zones, A, B and C, each of which is administered by a smaller WRUA and each has developed their own Micro-Basin Management Plan. Stratified systematic random sampling method was used to establish a sample size of 24 registered WRUA members from each of the micro-basins, on whom the research questionnaires were administered. With the full lists of WRUA members from each micro-basin, the total number of registered members was each divided by 24 to obtain a recurring interval of selection of sampled members from each list. The start point for each list was selected randomly after which a name was selected after every recurring interval as determined from the total population. The total number of sampled members from each zone was determined as 25 in Zone A, 23 in Zone B and 24 in Zone C, forming a sample size of 72.

Questionnaire Administration Procedures

The research assistants taking part in primary data collection were first taken through all the questions on the questionnaire so that they are familiar with what is expected, and were also trained on the procedure of administering the questionnaire, including how to make any useful observations during the course of the interviews that would enhance the objectivity of responses from those interviewed. Semi-structured questionnaires were first pretested using a pilot exercise so that any issues of concern are addressed and the questions revised where necessary. The research assistants were selected based on their academic

qualifications and the researcher first took each through an interview to determine their competency for the job.

In order to maximize on the efficiency in the information gathering, the interviews were carried out on separate days for each zone. Three research assistants were trained and used for each zone, each being sourced from their zone of residence. Each research assistant was allowed a maximum of four questionnaires per day due to the distance they needed to cover from one respondent to the next. KUWRUA Management Committee members from each zone were available to offer guidance to the data collectors but were themselves exempt from responding to the questionnaires.

Rating of Kuywa WRUA's implementation of the WDC process

As part of the evaluation of the Kuywa WRUA's performance in implementation of the WDC process, the principal researcher undertook to rate the WRUA's implementation of various activities on a scale of 1 to 10, with 1 being 'Very Poor' and 10 being 'Excellent'.

Table 4 shows the rating system adopted by the researcher in evaluation of the WRUA's implementation of the WDC process.

Table 4: Rating system for evaluation of the Kuywa WRUA's performance

Score	Rating	Score	Rating
1	Very Poor	7	Above Average
2-3	Poor	8	Good
4	Below Average	9	Very Good
5-6	Average	10	Excellent

4. Data Analysis, Presentation and Interpretation

Demographic Information of WRUA Members

The researcher sought to establish the demographic data of the WRUA members and looked at their gender, age, education level, monthly income and expenditures and their sources of income. Their responses are as indicated in the following sub-sections.

Gender of the WRUA Members

The respondents were asked to indicate their gender. Their responses were as shown in Table 5.

Table 5: Gender of the WRUA Members

Category	Frequency	Percentage (%)
Male	40	55.6
Female	32	44.4
Total	72	100.0

From Table 5, 55.6% of the WRUA members were males while 44.4% of the WRUA members were females. This implies there were more males respondents than females which might be because more males are interested in WRUA activities and by extension water for farming activities. This conforms to the observation that most decisions in operation and maintenance of water projects have been shown to be made by men as observed in studies by Motsi & Madyiwa.

Age of the WRUA Members

The age distribution of respondents is as shown in Table 6. The mean age of respondents was 46 years old.

Table 6: Age Distribution of the WRUA Members

Category	Frequency	Percentage (%)
18 – 29 years	5	7
30 – 39 years	17	24
40 – 49 years	25	35
50 – 59 years	18	25
Over 60 years	7	9
Total	72	100

As indicated in Table 6, 35% of the WRUA members who responded to the questionnaires were aged between 40 to 49 years, which represents the majority age group of the sampled population. 25% of the WRUA members were aged between 50 years to 59 years, with only 9% of the WRUA members being 60 years and above. About 24% of the members were aged between 30 to 39 years, with the youngest age group of those sampled (between 18 to 29 years) being only 7% of the total population. This shows that the population sampled was generally of mature age, able to understand the water resources and environmental issues facing them which this study focuses on.

Average households' size disaggregated by age

The WRUA members were asked to state the size of their households in terms of the number of members of the nuclear family only. Their responses are as indicated in Figure 3. The average household size was 7 people.

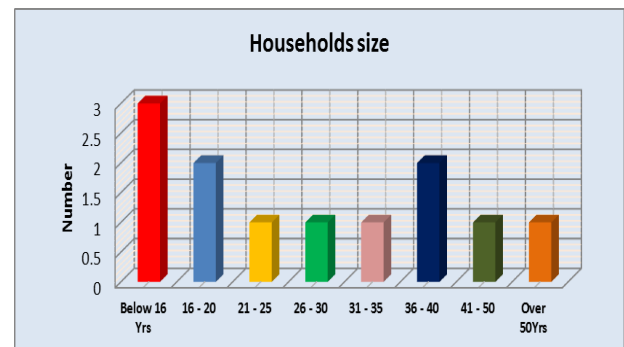


Figure 3: Average households' size disaggregated by age

On average, about 3 household members were aged 16 years and below, while 2 members were aged 16 to 20 years as well as 36 to 40 years. The rest of the age groups each had just one household member on average. This disaggregation is well in agreement with the country's demographic statistics which shows that the youths generally form the highest population in the country.

(i) Education Level of the WRUA Members

The education levels of respondents are shown in Table 7.

Table 7: Education Level of the WRUA Members

Category	Frequency	Percentage (%)
No schooling	1	1.4
Lower Primary	2	2.8
Upper Primary	21	29.2
Secondary	38	52.8

College	5	6.9
University	4	5.6
Other	1	1.4
Total	72	100

From Table 7, 52.80% of the WRUA sampled members had attained secondary school education while about 29.2% had attained upper primary school education. Only 6.9% and 5.6% of the WRUA members had attained college and university level education respectively, which shows relatively low literacy levels amongst the sampled WRUA members. This could indicate the unwillingness by the more educated members of the society to participate in matters of conservation, or could be attributed to the fact that most educated members of the society could have moved out of their rural homes to urban centres in search of employment. The low literacy levels could have an effect on the WRUA members' levels of constructive participation in WRUA activities.

(ii) Main Source of Income for Households

The respondents were asked to indicate their main source of income. Their responses were as indicated in Figure 4.

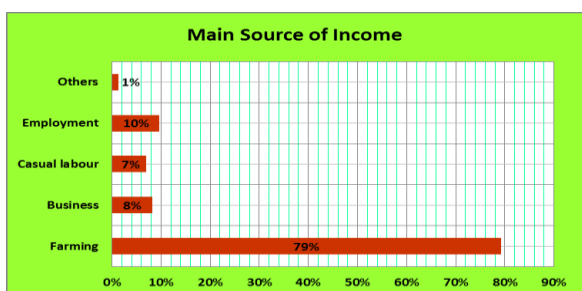


Figure 4: Main Sources of Income for Households

About 79% of all households interviewed depended on farming as their main source of income. About 10% were in formal employment while 8% were in business. The 79% majority depending on farming could perhaps provide an indication of why the WRUA members were keen to control environmental degradation within their basin area, as well as other issues related to water resources management.

Household's Awareness on Basin Conservation Issues

This section of the questionnaire sought to obtain information on the households' awareness about environmental issues within their basin area, the environmental services available, households' involvement in environmental conservation efforts, and information on the environmental conservation groups available within the area. Full details on the outcome of this are as outlined in the following sub-sections.

(i) Perception on the State of the Environment

Respondents were asked to state their perceptions on the state of the environment in the Kuywa sub-basin. Their responses are as stated in Table 8.

Table 8: Perceptions on the State of Environment in the Kuywa Sub-basin

Category	Frequency	Percentage (%)
Very Good	18	25.0
Good	41	56.9
Degraded	12	16.7
Very degraded	1	1.4
Total	72	100

From Table 8, 25% of the respondents believe that the state of the environment in the Kuywa River sub-basin is very good, while about 56.9% perceived that it was generally good. 16.7% of the respondents believe that the environment is degraded, with only about 1.4% reckoning that the state of the environment in the Kuywa sub-basin was very much degraded. It can be concluded therefore, that the WRUA members generally had a positive feeling about the state of the environment in the Kuywa River sub-basin. This positive attitude could partly be attributed to the sensitization and awareness campaigns carried out by the Kuywa WRUA which could have made the members more conscious about how they report on the state of their environment.

(ii) Perceptions on the Quality of the Water in Kuywa River

The respondents were asked their opinion regarding the state of quality of the water in the Kuywa River. Their responses were as summarised in Figure 5.

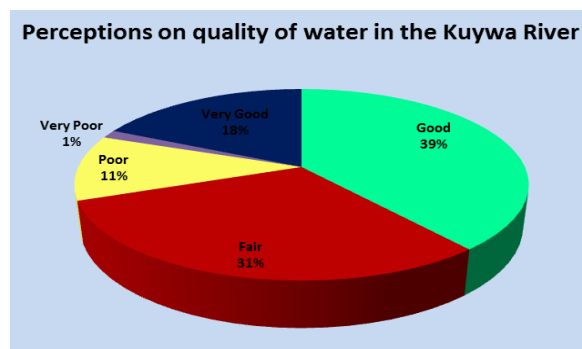


Figure 5: Perceptions on the quality of the water in the Kuywa River

From Figure 5, about 18% of the households believed that the quality of water from the Kuywa River was very good. Majority of the households (39%) believed the water was quality was generally good, 31% believed it was fair while 11% believed the water quality was poor.

Over 50% of the respondents felt that the water quality was either very good or generally good, which is an indicator of the efforts made by the Kuywa WRUA in trying to reinstate the state of water quality in the river.

(iii) Environmental Conservation Activities on WRUA Members' Farms

All the respondents interviewed reported carrying out environmental conservation activities on their farms. This shows that the WRUA's efforts to involve all WRUA members in conservation activities were bearing fruit. The various kinds of conservation activities carried out are as shown in Table 9.

Table 9: Environmental Conservation Activities on WRUA Members Farms

Category	Frequency	Percentage (%)
Terracing/contour ploughing	21	29.2
Indigenous trees planting	48	66.6
Rain water harvesting	10	13.8
Conservation of riparian lands	9	12.5
Organic farming	10	13.9
Others (specify)	2	2.8

(iv) Environmental Problems in Kuywa Sub-basin

Members were asked to state what they thought were the major environmental problems affecting the Kuywa River sub-basin. Their thoughts are as indicated in Figure 6.

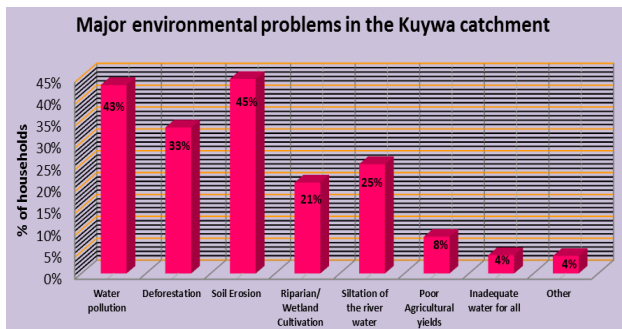


Figure 6: Major environmental challenges affecting the Kuywa sub-basin

From Figure 6, 43% of the respondents cited water pollution as the major environmental problem affecting Kuywa sub-basin. 45% of the respondents cited soil erosion, 33% cited deforestation, 25% cited siltation of the river water while 21% cited riparian land /wetland cultivation. Only 4% cited inadequate water for all as a major environmental problem.

(v) Major Causes of Pollution in the Kuywa River

Respondents were asked to indicate what they thought were the major causes of pollution in the Kuywa sub-basin. Their responses are summarised in Figure 7.

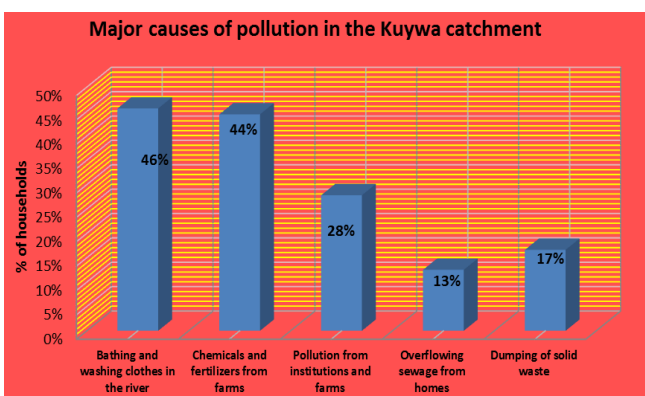


Figure 7: Major causes of pollution in the Kuywa sub-basin

From Figure 7, 46% of the households interviewed cited bathing and washing clothes in the river as the major causes of pollution in the Kuywa River. 44% cited pollution from chemicals and fertilizers from farms while 28% cited pollution from institutions and factories. About 13% of the households cited overflowing sewage from homes.

This problem of bathing and washing clothes in the river is indeed quite rampant in the Kuywa river sub-basin, as was witnessed by the researcher during his transect walks across the sub-basin. It can therefore be said that the responses in the questionnaires to the WRUA members corroborate well the physical field observations by the researcher, which is a good indication on the overall outcome of the research.

Kuywa WRUA's Activities and their Impact on the Ground

This section deals with activities carried out by the Kuywa WRUA in their efforts towards water resources management and basin conservation. The researcher's aim was to gauge the WRUA members' appreciation of the efforts that the WRUA has put in towards fulfilling their mandate of basin conservation and water resources management.

(i) Kuywa WRUA's Efforts in Sub-basin Conservation

The WRUA members were asked on whether they thought their WRUA was doing enough to fulfil its mandate of sub-basin conservation and water resources management. The summary of their responses is as indicated in Figure 8.

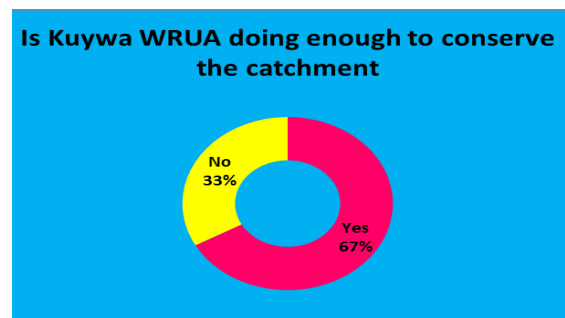


Figure 8: Perceptions on Kuywa WRUA's efforts in sub-basin conservation

From Figure 8, 67% of the respondents believe the Kuywa WRUA has done enough to ensure sub-basin conservation, with about 33% thinking otherwise.

(ii) Activities undertaken by Kuywa WRUA towards Sub-basin Conservation

The researcher sought to know the activities carried out by the WRUA to ensure water resources management and sub-basin conservation. Their responses were as summarised in Table 10.

Table 10: Activities undertaken by Kuywa WRUA towards sub-basin conservation.

Category	Frequency	Percentage (%)
Planting Indigenous trees	58	80.6
Remove eucalyptus trees on river banks	10	13.9
Building gabions/ terraces	17	23.6
Awareness creation	18	25.0
Water quality surveys	2	2.8
Others (specify)	0	0

Majority (80.6%) of the WRUA members cited planting of indigenous trees as the main activity carried out by the WRUA towards sub-basin conservation, followed by building of terraces and gabions (23.6%) and removal of eucalyptus trees on river banks (13.9%). This corresponded

well with the actual conservation activities carried out by the WRUA as per the funding they received from the government, as discussed in the later sections of this report.

(iii) Awareness about Illegal Water Abstractors in the Kuywa River

54% of the respondents were not aware of presence of illegal water abstractors in the Kuywa River. 23% said they were aware of illegal water abstractors, while another 23% did not know. Details as indicated in Figure 9.

The high percentage of unawareness amongst the WRUA members on this issue of illegal water abstractors could allude to lack of sensitization by the WRUA officials.

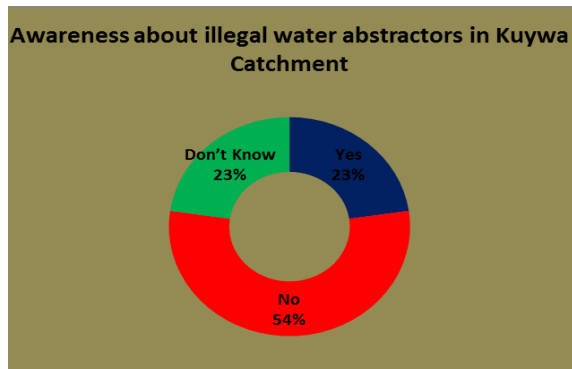


Figure 9: Awareness about Illegal Water Abstractors in the Kuywa River

(iv) Kuywa WRUA’s Activities to Curb Deforestation

The respondents were asked to mention some of the activities carried out by Kuywa WRUA to curb deforestation. Their responses were as summarised in Table 11.

Table 11: Kuywa WRUA’s Activities to Curb Deforestation.

Category	Frequency	Percentage (%)
Tree planting	53	73.6
Fencing off forested areas	9	12.5
Awareness creation	26	38.1
Reporting illegal loggers	8	11.1
Other (specify)	0	0

73.6% of the respondents cited tree planting as the WRUA’s main intervention measure towards curbing deforestation. This correlates well with the WRUA’s flagship project which was the planting of 17km of indigenous trees along the river in an effort to reclaim the riparian land and deter residents from cultivating too close to the river. The WRUA has also established various tree nurseries with the sub-basin, in which they stock mainly indigenous trees and sell to their members and even non-members encouraging them to plant along the river banks as well as within their farms.

(v) Impacts of the Kuywa WRUA’s Activities

The respondents were asked to state whether they had noticed any changes in management of water resources and sub-basin conservation since the Kuywa WRUA started operating, and to state some of the change they had noticed. The outcome of this survey is as summarized in Figure 10.

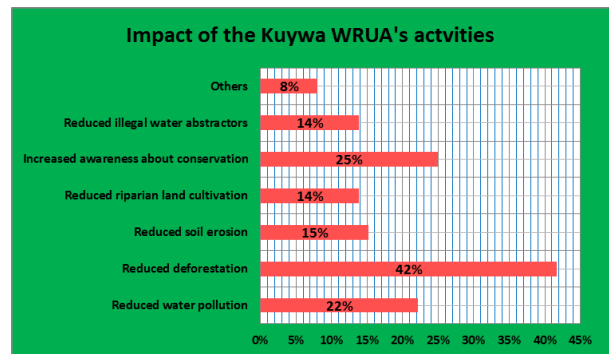


Figure 10: Assessment of Impacts of the WRUA’s Activities on the Sub-basin

From the Figure 10, all the respondents (100%) indicated that they had noticed a change since the WRUA started its operations. This is due to the fact that the activities the WRUA has carried out, such as planting trees along the riparian land, tree nurseries, spring protection works, cut-off drains, terraces and gabions along the roads, silt traps across the river, etc., were quite visible throughout the sub-basin. Approximately 42% of the respondents indicated they had noticed reduced deforestation, 25% stated they had noticed increased awareness about environmental conservation, while about 22% had noticed reduction in water pollution. Other changes noted by the respondents included reduction in the number of illegal water abstractors, reduction in riparian land cultivation as well as reduced soil erosion.

e) Focus Group Discussion with the WRUA Management

The researcher held a focus group discussion with members of the Kuywa WRUA management committee aimed at gauging their understanding of the concept of Integrated River Basin Management and its implementation at the local sub-basin level. To bring the participant to the same level, the researcher gave a brief overview about the objectives of this research, being to establish the roles of Water Resources Users Associations (WRUAs) in implementing the principles of Integrated River Basin Management at the local level.

The researcher posed various questions to the CMC members on the concept of Integrated River Basin Management at the sub-basin level, and sought answers from the various available members to gauge how each of them understood the concept.

Thereafter the researcher directed the discussion towards reviewing the various projects undertaken by the WRUA as part of their mandate for water resources management and sub-basin conservation. In order to specifically gauge the WRUA’s level of success in implementation of the concept of Integrated River Basin Management, it was important first to review their sub-catchment management plan (SCMP), which sets out the environmental and water resource management challenges that the sub-basin is experiencing, and the activities planned be carried out towards mitigating the identified challenges.

It was also important to ensure that the WRUA’s success is gauged not only on what they set out to accomplish through

their SCMP, but it should also be pegged on the planned activities for which they managed to secure funding from the various funding agencies. Thus the researcher restricted himself to the activities that the WRUA had obtained funds to carry out, to establish whether they were actually carried out as initially planned, using the funds that were available and set aside for the same.

(i) Review of WKCDD&FMP's Funding

The Kuywa WRUA received funds from the Western Kenya Community Driven Development and Flood Mitigation Project (WKCDD&FMP), which were used for funding the development of the Sub-Catchment Management Plan (SCMP).

A review of the Kuywa SCMP in line with the WDC modules reveals that the SCMP had a number of gaps that were not addressed as required by the WDC modules. The following are some of the emerging issues from the review of the WKCDD&FMP's funding:

- (i) The SCMP does not address issues of water demand, water balance and water allocation plan. The amount of water available in the sub-basin is also not determined/indicated;
- (ii) Water use monitoring plan within the sub-basin is not elaborate. Aspects such as use of water meter at abstraction points not mentioned, and also discharge measurement for canal and furrow systems not well explained;
- (iii) Monitoring permits-the two coffee factories have no valid authorization to abstract water from the river since their permit has expired;
- (iv) The SCMP failed to expand on Rights Based Approach (RBA) issues. Gender disparity is however mentioned, though the percentage of women is unknown;
- (v) The SCMP does not identify, analyze and list the key stakeholders based on their interaction with the community;
- (vi) The SCMP does not adequately address the issues of water use charges; neither does it properly articulate the importance of compliance, nor provides a compliance plan;
- (vii) The SCMP does not adequately address the issue of the reserve of the area, what quantity and quality are needed for the environment and basic human consumption, etc;
- (viii) The SCMP does not classify and analyze special basin areas within its jurisdiction. There is the mention of the wetlands which have been encroached upon, although these wetlands have not been mapped out; and
- (ix) The SCMP has not come out strongly on issues of institutional development and collaboration, although the Kuywa WRUA has a separate constitution and by-laws which govern its operations.

(ii) Review of WSTF's Level II Funding

The WRUA chairman availed the signed Level II funding contract between Kuywa WRUA and WRMA Regional Office in Kakamega, WRMA national office in Nairobi, and the Water Services Trust Fund (WSTF). From this signed agreement a list of the funded activities which were in line

with the principles of IRBM at the local level was established.

The Contract was signed on the 13th October 2011, and the works were to be completed by 30th October 2012. Key activities funded under this contract included the following:

- (i) Spring protection works;
- (ii) Construction of cut-off drains on sloped farms;
- (iii) Abstraction survey;
- (iv) Sub-basin protection; and
- (v) Training and sensitization.

The total amount of money received was Kshs. 1,767,645.00.

Overview of WSTF's Level II Funded Activities

The sections below provide a brief overview of the activities carried out by the WRUA through funding from WSTF, and their status as at the time of this review.

(i) Spring Protection Works

With the funding received from WSTF, the WRUA undertook spring protection works for a total 7 No. springs. The initial number proposed during application for funding was 5 No. but was increased to 7 No. during project implementation. This has contributed greatly to availability of clean potable water for the households, and also reduced dependence on the Kuywa River's water which is unfit for direct human consumption. Some of the springs however showed turbidity levels higher than recommended, just by visual inspection.

(ii) Construction of cut-off drains on sloped farms

The WRUA management had done several cut-off drains along sections of roads and foot paths which were hitherto prone to soil erosion. The funding proposal showed they had initially budgeted for construction of 3km of cut-off drains, although in the end, only about 1km of cut-off drains was done. The cut-off drains were mostly constructed with reinforced concrete although some were simply terraces dug across the floods pathways to divert the flow of storm water. This helped to reduce soil erosion along these roads.

(iii) Sub-basin protection

In terms of sub-basin protection the WRUA had undertaken a pilot indigenous tree planting exercise along the Kuywa River which was quite successful. About 17.0 km of indigenous trees were planted along the river from the bridge at Kuywa junction upstream of the river. Through sensitization and with involvement of the local administration, all the communities living along the river and cultivating up to the river were moved at least 10 meters away from the river banks to pave way for the planting of indigenous trees.

This not only protects the riparian ecosystem but it also prevents excessive human cultivation activities close to the river which leads to erosion and increased sediment deposit into the river water. The WRUA also established 2 No. tree nurseries planting approved river friendly trees which the WRUA plants as part of their reforestation exercise and also for income generation. The trees have helped to stabilise soils along the river banks, which were hitherto being washed down during heavy flooding thus widening the river.

The WRUA has continued with sensitization of their members against planting eucalyptus trees along the rivers, although this practice was still prevalent in the Kuywa sub-basin.

(iv) Silt trap (Weir) on River Kibisi

This was also funded by WSTF money and the intention was to construct a weir across the river that would reduce the flow velocities in the river to ensure as much as possible of the silt from the Kibisi River is trapped before it reaches the Kuywa River. However, with no major maintenance undertaken on the weir since its construction, the silt has since build up almost to the weir crest hence hampering the effectiveness of the weir as a silt trap.

(v) Abstraction Survey

The proposed abstraction survey was not carried out as initially budgeted for. Instead the community did 2 No. additional spring protection works. Abstraction survey was later carried out under funding from the German Society for International Cooperation (GIZ), brought on board by WRMA. GIZ also developed a Water Allocation Plan (WAP) for WRMA but both their Abstraction Survey and WAP reports were not accepted by WRMA. The WRUA is yet to obtain final copies of the abstraction survey report and water allocation plan from WRMA.

(vi) Community Sensitization

This was done using chiefs' and assistant chiefs' barazas.

Outcomes of WSTF's Level II Funded Activities

The WRUA management believe that the funding received from the WSTF achieved the objective it was intended for. The following were mentioned by the WRUA management committee as the positive outcomes of the WSTF initial funding:

- (i) The Kuywa River is now less polluted than it was at the start;
- (ii) Effluent from coffee factories was no longer being released into the river while still in its raw form. Each coffee factory is now required to construct effluent treatment ponds for treating their effluent water to acceptable standards before discharging into the river;
- (iii) Planting of eucalyptus trees along the river had reduced significantly over time, although the challenge still remains. The WRUA management reported that non-WRUA members especially were very obstinate and defiant;
- (iv) Indigenous trees planted along the river have helped in protecting the river banks from erosion and in restoring the riparian ecosystem;
- (v) Indigenous trees also use less water from the river, thus helping in water conservation;
- (vi) Livelihoods programme carried out by the WRUA members have greatly improved their economic living standards;
- (vii) Afforestation efforts were bearing fruit. The WRUA has established 2 No. tree nurseries where indigenous trees are cropped for planting. Afforestation has been mainly concentrated along river banks, as well as in some few homes and in schools;
- (viii) Tree nurseries were also their sources of income generation;

- (ix) Terraces along the roads and paths have not only reduced soil erosion but also helped in ensuring more water percolation thus aiding the underground water recharge;
- (x) More members of the WRUA were now more sensitized about conservation issues;
- (xi) Contour ploughing was now being practiced by farmers on sloping land parcels;
- (xii) More springs have been protected and more people have been sensitized to wash at the springs and not in the river;
- (xiii) To curb the problem of people washing in the rivers, the WRUA management committee has divided the entire sub-basin into sections and allocated each member a section to man, where those who disobey are reported to the local administration;
- (xiv) Watering animals directly in the river has also been discouraged;
- (xv) Uncontrolled irrigation upstream which used to divert and waste a lot of water has also been outlawed with everyone who wants to irrigate having to obtain a permit. Small scale pumping from the river for irrigation was also outlawed;
- (xvi) The WRUA management reported to have carried out a polluter survey and had developed an inventory of polluters. Potential polluters especially at market centres have also been mapped out; and
- (xvii) Erosion has been reduced substantially although the some potential erosion areas are yet to be addressed due to lack of funds.

Challenges faced by the Kuywa WRUA

- (i) Lack of funding: there has not been any more funds availed to the WRUA since 2013, which has adversely affected the WRUA's efforts in sub-basin protection and most of their projects have died off;
- (ii) WRUA management committee carry out their work on voluntary basis, with no allowances. This demoralizes them;
- (iii) Defiance and little cooperation from both WRUA members and non-members towards the proposed sub-basin management plans. For instance Eucalyptus tree planting along the river is still rampant despite the WRUA's sensitization programmes;
- (iv) Political interference, with the political leaders taking credit for projects that were not initiated by them. The WRUA CMC noted that CDF boards usually come on board when the projects are close to completion, and they want the projects branded as CDF-funded;
- (v) Land owners on whose land the protected springs are located have also caused problems in some cases, wanting to be compensated for the land, even though the springs were serving the communities for free before they were protected;
- (vi) Challenges of fund-raising, with many proposals preparation, which costs money but many of which yield nothing in the end;
- (vii) Challenges of funds collection from the WRUA members through monthly/annual contributions. Many members have failed to pay for their annual shares contributions;

(viii) Failed promises to the members also demoralizes them leading to low participation – e.g. some grevillea tree seedlings that were promised to be issued to the members but were never delivered.

Review of WKCDD&FMP’s 2nd Funding

The WRUA received the 2nd funding from the World Bank through the Western Kenya Community Driven Development and Flood Mitigation Project (WKCDD&FMP), towards the Kuywa Water Basin Conservation Micro-Project. The total amount of funding was Kshs. 2,000,000.00.

The project sought to address the following problems:

- (i) Environmental degradation;
- (ii) Water-borne/related diseases; and
- (iii) Deforestation.
- (iv) The activities funded were as follows:
- (v) Spring protection;
- (vi) Gulley control; and
- (vii) Planting water friendly trees.

The project started on 1st April 2013 and ended on 30th June 2013. Table 12 shows the performance of the WKCDD&FMP’s funded project as per the appraisal carried out by WKCDD&FMP’s monitoring and evaluation team.

Table 12: Project Appraisal Form and Scores

No.	Indicator	Weighting	Score
1	Promoting Adoption of Appropriate land use practices in targeted micro-basins	22	20
2	Undertaking/implementing specific soil and water conservation activities in the targeted areas	22	20
3	Reducing Sediment load in rivers in the targeted micro-basins	22	20
4	Preparation and approval of Micro-Basin Action Plans (MCAPs)	22	21
5	Promoting activity-specific income generation in targeted areas	12	8
6	Total score	100	89

Key Informant Interview with WRMA Regional and National Office

The Principal researcher carried out a key informant interview with a senior official from the WRMA National office in charge of community development to obtain her perspective about the status of implementation of Integrated River Basin Management through the WDC process. She noted that WRMA has made great strides in carrying out its mandate as the body charged with implementing Integrated River Basin Management across all basins in Kenya, with the help of WRUAs at the sub-basin level. The Authority had managed to streamline and fully operationalize Integrated Water Resources Management (IWRM) in line with international recommendations. The Authority had also revised the WDC manual to include three more chapters in order to deal with emerging issues, and to incorporate lessons learnt through the eight years of implementation of the WDC process.

a) Challenges faced by WRMA in implementing the WDC through WRUAs

Some of the challenges faced, as pointed out by the WRMA official, included the following:

- (i) Limited funding: the WDC process depended heavily on donor funding, with only a small portion of the funds being provided by the Kenyan government. Initially the donors provided funding with no stringent controls over where it would be used. However, with the advent of devolution the donors were now becoming specific on where they wanted their funds used. Some donors have specified that they only want their funds utilised within certain Counties, for instance within the Arid and Semi-arid lands (ASAL) areas etc. This means that some counties have gone without funding for a long since no donors have come forward seeking to fund WRUA activities within their location;
- (ii) Political interference: the local, regional, or even national politics have tended to have an effect on the operations of the WRUAs and their activities;
- (iii) Inaccessibility of some regions due to their remoteness has meant that some areas have not received sufficient coverage by WRUA operations. Recent cases of insecurity in some areas especially in the Northern frontiers have also provided challenges;
- (iv) Climate issues e.g. floods which have caused some areas to be cut off, or damaged some of the infrastructures developed by the WRUAs;
- (v) Policy challenges: Funding from the central government to WRUAs activities has been minimal due to skewed policies which have tended to prioritize other water sector issues such as water supply at the expense of water resources management;
- (vi) Conflict in legislation and overlapping mandates among government institutions: lack of clear-cut mandates amongst various government institutions operating within the water sector, for example, between NEMA, National Land Commissions, Kenya Water Towers Agency, County Governments and WRMA has led to conflicts;
- (vii) Language barriers in some cases, especially when it comes to training the WRUAs on the WDC process;
- (viii) Lack of capacity amongst the WRUAs: High illiteracy levels in some areas has meant that even the best of the available WRUA members are still not able to be sufficiently trained to champion the interests of the WRUA;
- (ix) Poor work done by some consultants: Some of the activities required to be carried out, such as abstraction surveys, are highly specialised and require expertise not found amongst the WRUA members, thus requiring them to hire consultants. While some consultants have come in and done excellent jobs as per their terms of reference, others have returned shoddy and poor outcomes that ended up being rejected by WRMA; and
- (x) Poor handling of consultancy jobs: The funds required for carrying out consultancy jobs are usually deposited in the WRUAs accounts thus placing them under charge of the WRUA management committees. Due to lack of technical knowhow, the management committees have been duped into paying the consultants for services rendered even before the outcomes of their

consultancies are verified by the WRUA members or by WRMA. In case their reports are later rejected by WRMA for being shoddy then the funds will already have been wasted.

b) Weaknesses in the WDC process

- (i) The WDC does not provide for funding for the formation on WRUAs. It only provides for funding for SCMP development assuming that the WRUAs are already established and in operation. This has left WRMA with the burden of funding the formation of WRUAs, an activity that is quite costly as well;
- (ii) The WDC provides that only 15% of the WSTF funds will go to WRMA for funding technical support and oversight over the WRUA activities. This according to WRMA is quite a small amount compared to the amount of work required to offer technical support and oversight to the WRUAs;
- (iii) While the WDC manual itself is very detailed and adequate for the intended purpose, sometimes the WDC trainers, who are either WRMA staff or hired consultants contracted to offer training to the WRUAs and guide them through the SCMP development, could themselves be inadequately prepared and not fully familiar with the manual. WRMA has tried to mitigate for this through regular refresher courses for its old staff, while the new staff are also thoroughly trained in the WDC process before they are allowed to offer training to the WRUAs; and
- (iv) The WRUAs as established under the Water Act 2016 are voluntary organizations of individuals who have an interest in water resources within a sub-basin. Thus most of their participation in the WRUA's activities, while it costs time and money, is usually voluntary without any compensation from the government. This has led to low participation by some members in the WRUAs activities, while some have dropped out completely to concentrate on other income generating activities to fend for their families.

c) Lessons learnt by WRMA in implementing the WDC through WRUAs

The WRUAs are WRMA's medium for Integrated River Basin Management at the sub-basin level, through the WDC process. In WRMA's view the WRUAs have been quite effective in carrying out this mandate, although with a few exceptions in different parts of the country. A review of the WRUAs as impact across the country will reveal that WRUAs have done tremendously well in fulfilling their objectives as outlined in the WDC document (WRMA, 2008).

WRMA has in the year 2014-2015 revised the WDC Manual Volume II to include three additional chapters (modules) to incorporate some of the lessons learnt from the implementation of the earlier version of the manual. The three new chapters are:

- (i) **Livelihoods enhancement:** This chapter seeks to address the problem of reducing participation of WRUA members in WRUAs activities due to the perceived lack of benefit therein. The livelihoods chapter provides for funding and training of the WRUA members in income

generating activities such as tree nurseries, poultry keeping, bee keeping, greenhouse horticulture, fish keeping. The WRUAs are required to identify some income generating activities which they wish to engage in and to include their costs in the budgets which are presented to WSTF or to other donors for funding;

- (ii) **Climate change adaptation:** This chapter seeks to promote training of the WRUAs towards adaptation to climate change. The objective is to build resilience of the communities towards the effects of climate change through building their adaptive capacity, embracing drought resilience crops, etc.; and
- (iii) **Flood and Drought mitigation:** This chapter seeks to better prepare the communities towards dealing with floods and droughts. This is done through encouraging the communities to build their homes on higher grounds, to build storage facilities, and to develop some simple early warning systems which can be easily adopted by the communities.

d) Challenges faced by WRUAs in implementing their SCMPs

- (i) **Participation of members in the WRUAs activities:** Some of the WRUA members are unwilling to participate in the WRUAs activities due to perceived lack of benefit therein. Some have even sabotaged the activities of the WRUAs by insisting on cultivation on the riparian lands, watering their animals directly in the rivers, etc.;
- (ii) **Gender imbalance and marginalisation of the women:** Women participation in WRUA activities is minimal, yet women are key members in the utilisation of the natural resources in the sub-basins. Even in WRUA management committees the two thirds gender rule has been ignored in some WRUAs, while in some others the women's voices generally ignored;
- (iii) **Challenges in citing the projects:** Sometimes the WRUA leadership gets biased in siting the projects, concentrating them on one side of the sub-basin based on the influence the leaders have on the WRUA; and
- (iv) **Political interference:** local politicians including MCAs and MPs have had meddled in the activities of the WRUAs to try and gain political mileage. Cases of MCAs and MPs claiming credit for projects that they never participated during initiation and implementation are rife. Sometimes MPs have sponsored a small portion of the projects through CDF money and then went ahead to claim ownership of the entire projects.

e) How to increase WRUAs' effectiveness in implementation of their SCMPs

- (i) **Capacity building of the WRUAs' leadership** through continuous training on aspects such as book keeping, conflicts resolution, financial management etc., will enhance their effectiveness;
- (ii) **Building capacity of the WRUA leaders for fundraising:** WSTF's funding is becoming more and more limited, and therefore the WRUAs need to be sensitized on other ways of raising money. Committees should be formed just to deal with continuous fundraising, through writing proposals and

looking around for possible funding opportunities; and

(iii) Involvement of the WRUA members in the activities carried out by the Consultants in order to ensure ownership of the outcomes, for effective implementation of the recommendations. Under normal circumstances the consultants reports are usually presented to the stakeholders during the verification workshops were the outcomes and recommendations are read to the members to ratify and approve. This helps to a certain extent, but if the WRUA members were closely involved from the start of the exercise it could have helped the communities to better own the outcome of those exercises.

f) Coordination amongst WRUAs working within the same basin

As already discussed in Chapter Two of this report, one of the challenges facing WRMA in its quest towards Integrated River Basin Management has been lack of coordination

amongst the various WRUAs working within a larger river basin. The recently introduced concept of basin forums by WRMA, if properly operationalized will be crucial in providing the much needed coordination amongst water users within each basin in the country. This concept has already been incorporated in the recently revised Basin Area Water Resources Management Strategies for each of the six basin areas across the country (WRMA, 2016).

g) Role of WRMA in supporting WRUAs in implementation of the WDC

The WDC booklet (WRMA, 2009) has highlighted the roles of WRMA, sub-regional, regional and national offices in the implementation of the WDC process. The principal researcher sought to review the roles of WRMA in supporting WRUAs towards implementation of the WDC process, and rated WRMA's performance of these roles on a scale of 1 to 10, with the rating system as indicated in Section 3.10 of this report. The outcome of this evaluation is summarised in Table 13.

Table 13: Role of WRMA in supporting WRUAs in implementation of the WDC

No.	Roles of WRMA in Support of WRUAs	How WRMA has performed its roles in supporting the WRUAs	Score Out of 10
Roles of WRMA Sub-regional Office			
1	Assistance in development of the WRUAs and SCMPs	<ul style="list-style-type: none"> WRMA in conjunction with WSTF have developed the WDC document which guides the development of WRUAs at each sub-basin level 	8
2	Capacity building of WRUA CMC members to perform their roles effectively	<ul style="list-style-type: none"> Capacity building trainings were carried regularly although low literacy levels among the committee members hamper the capacity building efforts WRMA facilitates the WRUA CMC members to undertake exchange programmes for learning and bench-marking 	8
3	Technical support to WRUAs during the implementation of their SCMPs	<ul style="list-style-type: none"> WRMA has employed fully trained field officers who work with the WRUAs in each sub-region to provide technical support and backstopping. WRMA capacity is however limited in view of the number of WRUAs that each sub-region is required to oversee. 	7
4	Financial support to the WRUAs during the implementation of their SCMPs	<ul style="list-style-type: none"> In WRMA's own admission, financial limitations were the biggest hindrance to their efforts towards IRBM through the WRUAs at the sub-basin level. However, with limited funds at their disposal they have done a commendable job in facilitating formation of WRUAs, development of SCMPs and technical support to WRUAs in implementation of funded activities. 	6
5	Monitoring an evaluation of WRUAs activities	<ul style="list-style-type: none"> WRMA regularly monitors the activities of WUAs and prepares M&E reports; WRUAs also prepare their own M&E reports which they submit to WRMA for review. 	7
6	Support the WRUAs in development of proposals for seeking funding from WSTF	<ul style="list-style-type: none"> WRMA has performed out this role effectively with the help of its field officers 	8
7	Support WRUAs in developing TORs and other contractual matters pertaining to the recruitment of SOs	<ul style="list-style-type: none"> WRMA has performed out this role effectively with the help of its field officers. 	8
Roles of WRMA Regional Office			
8	Undertake desk and field appraisals of WDC applications and forward to WRMA National Office	<ul style="list-style-type: none"> WRMA has performed out this role effectively with the help of its field officers 	8
9	Support quality improvements in SCMP development and implementation	<ul style="list-style-type: none"> Use of SOs in development of SCMPs has ensured that their quality is assured. The challenge has been how to ensure the WRUA CMC members are fully involved during the SCMP development process. 	8
10	Coordination of efforts by WRUAs within one sub-basin	<ul style="list-style-type: none"> WRMA has not had a strong framework for coordination of all the activities of WRUAs working with one sub-basin. It has however recently introduced a concept of basin forums where all the 	5

No.	Roles of WRMA in Support of WRUAs	How WRMA has performed its roles in supporting the WRUAs	Score Out of 10
		WRUAs operating within the same basin meet once a year to discuss issues affecting the basin, and to exchange ideas on workable conservation mechanisms.	
11	Pre-qualify and induct SOs	<ul style="list-style-type: none"> WRMA does this effectively through its trained field officers. 	8
Roles of WRMA National Office			
12	Coordinate the WDC applications to WSTF	<ul style="list-style-type: none"> This has been carried out effectively through WRMA's structures from sub-regional to national office. 	8
13	Mobilize resources for WDC process	<ul style="list-style-type: none"> WRMA has not performed strongly in mobilization of funds towards implementation of WDC process. This could be due to the fact that WRMA's mandate is very wide and most of its resources get utilised in other more pressing issues. 	6
14	Review procedures and strengthen quality of the WDC process	<ul style="list-style-type: none"> Monitoring and evaluation both at the regional and national level has ensured that lessons learnt are incorporated towards strengthening the WDC. 	8
15	Audit compliance to WDC systems	<ul style="list-style-type: none"> This has been carried out effectively through WRMA's internal audit systems 	9

Key Informant Interview with Water Services Trust Fund

The principal researcher carried out a Key Informant Interview with the Manager in charge of Water Resources Investment at Water Services Trust Fund (WSTF). The objective of the interview was to obtain WSTF's perspective on the effectiveness of the WRUAs in carrying out their mandate especially with respect to the funding received from WSTF. The outcome of the interview is as outlined in the following sub-sections.

a) Overview of the WSTF funding process for WRUAs

WSTF's funding for the WRUAs is usually released in four levels, as follows:

- Level 1 funding with a ceiling of Kshs. 1.5 million which is used for holding two workshops, i.e. (i) capacity building workshop to sensitise more community members to join the association and participate in SCMP development, and (ii) SCMP development workshop.
- Level 2 funding ceiling is Kshs. 5 million for funding activities in the SCMP which can fit within the Kshs. 5 million.
- Level 3 funding ceiling is Kshs 10 million for funding SCMP activities after successfully completing level 2 funding.
- Level 4 funding ceiling is Kshs. 30 million (3 tranches of 10 million each).

The maximum amount of funds that can be given to a WRUA is Kshs. 50 million. For every amount of funds that are released to the WRUAs, 15% of that money goes to WRMA for facilitating their supervisory function during the implementation of the projects.

Donor funding for the WRUAs is currently very limited, with only 3 financiers at the moment. These three are as follows (WSTF, 2016):

- (i) Governments of Finland and Sweden doing joint financing
- (ii) Medium Term ASAL (arid semi-arid lands) Programme funding in 6 counties only
- (iii) IFAD, financing community forest associations in Mt. Kenya and Aberdare area, also working in 6 counties only.

A total of 18 Counties of the 47 are currently funded.

b) Effectiveness of the SCMPs in ensuring Integrated River Basin Management

In WSTF's opinion, the SCMPs as developed by the WRUAs are quite effective in ensuring sustainable water resources management and sub-basin conservation. The SCMP as developed takes care of most of the issues, and is usually prepared through a highly participatory process so that all issues are identified and prioritised. If the SCMPs can be fully implemented they can definitely ensure sustainable water and natural resources management. The challenge is usually the limited funding.

c) Efficiency of the WRUAs in utilizing the funds received

Most WRUAs have been efficient in their utilization of the allocated funds. The money is usually given starting with smaller amounts as the WRUAs are gauged to see their accountability. The funds keep increasing in amount as the WRUAs grow and develop better structures for financial management and accountability. Those WRUAs who mismanage their initial tranche of funds will most likely miss out on future allocations. There have been a few audit queries here and there but not on large scale.

d) Capacity building trainings provided by WSTF to the WRUA leadership

WSTF does capacity building trainings for WRUA management committees in Financial Management and Procurement to ensure they are well equipped to do proper accounting. The WRUAs are also allowed to include in their budget some amount for training under chapter 10 for institutional development.

e) Weaknesses Noted in the WDC process

- (i) Some WRUAs have complained that the WDC process is long. The WSTF officer reported cases of funds being returned to the donors at the end of the window period, yet there were many WRUAs in need of the funds to implement their SCMPs, with many basins in the country under serious threat of degradation;

- (ii) Financing mechanism: The 15% funding is usually released to the WRMA headquarters, and there are delays before reaching the sub-regional offices. Sometimes it completely fails to reach the sub-regions, yet they are the ones who need it most; and
- (iii) Women who are the major stakeholders in water issues are usually marginalised by cultural issues, where they are not allowed to contribute to matters of the WRUAs. The two thirds gender rule is also just followed on paper but the women's voice is mostly ignored.

f) Suggested improvements in the WDC process

- (i) Further improvements required on the ceilings for each level to ensure that more money is absorbed by WRUAs to finance the pertinent issues affecting the sub-basins;
- (ii) Further improvements are required on the WDC process to ensure funds are issued faster. Donor funding usually comes with deadlines, and sometimes the lengthy processes of applying for the funding has seen some donor funds returned once the deadlines are surpassed without having been used. Monies should be released in bigger tranches so that they are utilised within the allocated timelines;
- (iii) New legislation required to facilitate improved funding received from government for conservation activities. Conservation monies should be included in the annual budgets for both the national and county governments. Sometimes the government's part of the funding delays excessively, or is diverted to meet other issues which are perceived to be more urgent and priority; and
- (iv) Sensitise people to change their attitude towards conservation activities. Most government actors, including policy makers, don't seem to be fully informed about the importance of Water and Natural Resources Management. There seems to be more emphasis on water supply at the expense of water

resources management, yet water supply depends heavily on water resources management.

g) How the WRUAs can improve their efficiency in utilization of their funds

More capacity building training is required on financial management. Usually what is provided for under WDC is too short, just about three days. A new concept of training using academic institutions to assist the WRMA personnel in offering trainings to WRUAs management committees is required, a Public Private Partnership to empower the private sector to support WRMA in capacity building trainings for WRUAs.

h) WRUAs' ability to balance between various competing interests

The final question that the principal researcher had was whether the WRUAs were able to strike a balance between various competing issues such as carrying out livelihoods activities, ensuring Rights Based approach, awareness creation, conflict resolution and actual sub-basin conservation activities, which should be their core mandate. However, according WSTF, this has been mainly achieved by WSTF's stringent review of the budgets submitted by the WRUAs, which ensures that there is a balance so that not all the funds allocated are directed to other issues other than sub-basin conservation.

i) Role of WSTF in supporting WRUAs towards implementation of WDC process

The principal researcher sought to understand the role of WSTF in supporting WRUAs towards implementation of IRBM, and how they have fared in carrying out this role. The main roles of WSTF have also been outlined in the WDC booklet (WSTF, 2009). A summary of this review is as indicated in Table 14. The researcher also evaluated the WSTF's performance in supporting WRUAs towards implementation of the WDC process, on a scale of 1 to 10, according to the rating system indicated in Section 3.10 of this report.

Table14: Role of WSTF in supporting WRUAs towards implementation of WDC process

Roles of WSTF in Support of WRUAs	How WSTF has performed its roles in supporting WRUAs	Score out of 10
Mobilise resources for WDC	WSTF's main source of funding for the WDC process is from foreign donors, and not from the government budgetary allocations. This has hampered effective implementation of the WDC process in many sub-basins since donor funding is usually limited and/or comes with pre-conditions.	6
Appraisal and approval of project proposals	WSTF appraises and approves proposals submitted by WRUAs seeking funding. While the number of qualified proposals is usually many, the proposals that are actually approved for funding are quite few due to limited funds.	7
Monitor implementation of funded projects	WSTF does this effectively through its field officers, done in conjunction with WRMA field officers.	8
Audit compliance to WDC systems.	This has been carried out effectively through WRMA's internal audit systems.	9

5. Analysis of the Findings

a) Principles of Integrated River Basin Management

Based on Literature Review, the key (cross-cutting) principles of integrated river basin management can be summarized as follows:

- (i) Strategic river basin planning;

- (ii) Integration of functions and coordination;
- (iii) Scale;
- (iv) Stakeholders involvement;
- (v) Prioritizing and Timing of Actions Plans;
- (vi) Institutional arrangements and Capacity building;
- (vii) Accountability; and
- (viii) Monitoring and reporting.

Strategic River Basin Planning starts with the formation of an appropriate river basin organization with clear roles and duties (Hooper, 2005). Once the RBO is established it shall be guided by the following internationally accepted rules of Strategic River Basin Planning (Pegram et al, 2013):

- (i) Develop a comprehensive understanding of the entire system;
- (ii) Develop appropriate river basin management plans to guide the vision;
- (iii) Plan and act, even without full knowledge;
- (iv) Prioritize issues for current attention, and adopt a phased approach for long-term goals;
- (v) Enable adaptation to changing circumstances;
- (vi) Develop relevant and consistent thematic plans;
- (vii) Address issues at the appropriate scale;
- (viii) Engage stakeholders with a view to strengthening institutional relationships;
- (ix) Focus on implementation of the basin plan throughout; and
- (x) Select the planning approach and methods to suit the basin.

In the Kenyan context, it can be rightfully presumed that the Water Resources Users Associations are the legally established River Basin Organizations mandated with the role of Strategic River Basin Planning at the local level. In order to effectively carry out their mandate, and in line with the requirements of IRBM, the WRUAs have developed their own River Basin Management Plans, the Sub-Catchment Management Plans.

In line with this understanding, the researcher sought to establish how well the WRUAs, as Kenya's vehicles for Integrated River Basin Management, have carried out this mandate. The researcher reviewed the WRUA's alignment with internationally accepted principles of IRBM, such as Strategic River Basin Planning; Integration of Functions and Coordination; Institutional Arrangements and Capacity

Building; Scale; Stakeholders Involvement; Prioritization and Timing of Actions Plans; Accountability; and Monitoring and Reporting.

b) Kuywa WRUA's Implementation of Integrated River Basin Management

The Kuywa WRUA's SCMP has been developed based on the WDC process, which guides the formation of WRUAs and the development of SCMPs for the WRUA's implementation. It is also clear from the literature review in Chapter Two of this report, that the WDC process is quite consistent with the internationally accepted principles of IRBM, and that in implementing the WDC process in Kenya, the WRUAs are basically implementing the principles of IRBM.

A brief overview of the principles of Integrated River Basin Management, and how the Kuywa WRUA has implemented these principles through their SCMP, is discussed in the following sub-sections.

(i) Strategic River Basin Planning

Integrated River Basin Management cannot be successful without Strategic River Basin Planning. This starts with the formation of an appropriate River Basin Organization with clear roles and duties (Hooper, 2005), followed by the development of a comprehensive River Basin Management Plan. The Kuywa WRUA, as the RBO mandated with implementation of IRBM within the Kuywa sub-basin, has done well to develop its sub-catchment management plan as a starting point in IRBM implementation. A review of the WRUA's SCMP in line with the rules of Strategic River Basin Management (Pegram et al, 2013) is summarized in Table 15.

Table 15 also shows the researcher's rating of the WRUA's compliance with the rules of Strategic River Basin Planning.

Table 15: Kuywa WRUA's Compliance with the rules of strategic river basin planning

No.	Rules for Strategic River Basin Planning	Kuywa WRUAs Compliance With The Rules for Strategic River Basin Planning	Rating
1	Develop a comprehensive understanding of the entire system	The WRUA undertook a comprehensive study of the Kuywa sub-basin during the development of its SCMP, which helped to map out the major water and other natural resources and identify the major challenges facing the sub-basin. Thus the WRUA has sufficiently complied with this rule.	8
2	Select the planning approach and methods to suit the sub-basin	The Kuywa WRUA's SCMP was developed based on the basin conditions unique to the Kuywa sub-basin.	8
3	Develop appropriate River Basin Management Plans to guide the vision	The Kuywa WRUA's SCMP lays down the plan for managing the sub-basin, and guides the WRUA on which steps to take towards that vision. The WRUA has therefore complied sufficiently with this rule.	9
4	Plan and act, even without full knowledge	The WRUA was able to develop a SCMP and to start off the conservation activities without full knowledge of all the conservations issues within the sub-basin and their inter-relations. Some aspects of the sub-basin such as abstraction survey and pollution survey were carried out later, but the planning and basin conservation process had already started.	8
5	Prioritize issues for current attention, and adopt a phased approach for the long-term goals	Kuywa SCMP outlines the short-term, medium-term as well as long-term goals for the WRUA. The WRUA had also prioritized some of the issues that require immediate attention, for which they sought funding.	8
6	Enable adaptation to changing circumstances	Kuywa SCMP is based on the WDC process which is itself evolving with time to adapt to the changing circumstances. The new version of the WDC has incorporated emerging issues such as livelihoods, climate change and drought and flood mitigation.	7
7	Develop relevant and consistent thematic plans	Kuywa SCMP has been developed along basic river basin management themes such water resource allocation, water quality management, soil erosion control, riparian	8

No.	Rules for Strategic River Basin Planning	Kuywa WRUAs Compliance With The Rules for Strategic River Basin Planning	Rating
		and wetlands ecosystem conservation etc. With these in mind the planning team was able to develop appropriate planning approaches and institutional considerations relevant to each.	
8	Address issues at the appropriate scale	The Kuywa WRUA is operational at the sub-basin level which is the lowest level in the WRMA organizational hierarchy. Thus the WRUA is best suited to address issues at the local level since its leadership and membership is a draw from the local level.	9
9	Focus on implementation of the basin plan throughout	The Kuywa WRUA has developed their SCMP which guides its activities to avoid any tendency to drift away to irrelevant businesses and distractions.	
10	Engage stakeholders	The WDC process of SCMP development is highly participatory. This ensures that all relevant stakeholders are consulted and engaged in order to seek for solutions that are acceptable to all.	7
11	Average Score		8.0

(ii) **KUWRUA's Compliance with Principles of Integrated River Basin Management** Table 16 shows the assessment of the WRUA's compliance with other principles of IRBM.

Table16: Assessing KUWRUA's compliance with the Principles of IRBM

<i>Principles of IRBM</i>	<i>Kuywa WRUA's Compliance with Principles of IRBM</i>	<i>Rating</i>
Integration of Functions and Coordination	Kuywa WRUA is just one of the various WRUAs under the Lake Victoria North Basin Area, all managed by the WRMA Regional office in Kakamega. The Regional office coordinates all the WRUA activities in the basin area by ensuring that all WRUAs are engaged in conservation activities as per their mandate. The WRMA regional offices are in turn coordinated by the WRMA national office in Nairobi.	7
Institutional Arrangements and Capacity Building	The Kuywa sub-basin is just one of the various sub-basins within the larger Nzoia river basin, which is itself a sub-sub-basin of the larger Lake Victoria North Basin Area. The Kuywa sub-basin is administered by the Kuywa WRUA, which reports to the WRMA regional office in charge of the Lake Victoria North Basin Area, based in Kakamega. The Kuywa WRUA is organized into a Central Management Committee with sub-committees in charge of finance, etc.	8
Scale	The Kuywa WRUA operates at the local level, and has its objectives as being water resources management and sub-basin conservation issues at the local level, and has the mandate to set its objectives and activities to meet the issues and challenges relevant to its locality.	9
Stakeholders Involvement	The Kuywa WRUA has well established mechanisms for stakeholder participation in decision-making on all issues affecting the sub-basin. This has helped to ensure that conflicts are resolved on a negotiated platform rather than through legal channels, thus ensuring that issues of sub-basin conservation and water resources management are always prioritized over sectorial interests.	8
Prioritization and Timing of Actions Plans	The Kuywa WRUA's SCMP has a prioritized action plan showing the activities planned and their time-frames. The proposed action plans have also been classified into short-term (2-3 years), medium-term (4-5 years) and long-term (6-10 years).	8
Accountability	The Kuywa WRUA's activities are monitored both by the WRMA regional office to whom they report, and by the agencies that fund its projects and activities, such as the WSTF. This ensures that the WRUA's activities and action plans are strictly aligned with their mandate as set out in the Water Act 2016.	8
Monitoring and Reporting	The Kuywa WRUA is answerable to the WRMA sub-regional office in Kitale, as well as the WRMA regional office in Kakamega. The WRUA Prepares and submits annual reports. As a pre-requisite for the funding, the WRUA is required to ensure that it prepares and submits reports to the funding agencies detailing the funds received and how they were utilized.	8
Average Score		8.0

c) Assessing the WRUA's Performance in Implementation of the WDC Process

A summary of the WRUA's performance in implementation of the various issues related to Integrated River Basin Management at the sub-basin level is as shown in Table 17.

Table17: Assessing the WRUA's performance in implementation of the WDC Process

Review Items	Score	Total
General issues related to the WRUA, SCMP and WRUA CMC		
Role that stakeholders played in the development of the SCMP	7	10
Role that stakeholders play in implementation of the SCMP	6	10
Does the WRUA have an inventory of the water polluters?	9	10
Does the WRUA have an inventory of illegal water abstractors?	7	10
WRUA CMC's appreciation of Integrated River Basin Management	5	10
WRUA CMC's appreciation of Integrated Water Resources Management	8	10
Average Score	7.0	10
WRUA's performance in implementation of funded activities:		
Spring protection works	9	10
Sub-basin protection (planting indigenous trees along river banks)	8	10
Livelihoods activities	8	10

Review Items	Score	Total
Tree nurseries	9	10
Construction of cut-off drains on sloped farms	8	10
Carried out abstraction survey	7	10
Water quality protection (silt trap on river Kibisi)	8	10
Water pollution control (tackling water polluters)	8	10
Implementing specific soil and water conservation activities	8	10
Preparation micro-basin action plans (MCAPs)	9	10
Training and sensitization	9	10
Average Score	8.3	10
Improvements in the state of the environment since the WRUA started implementing the funded activities	Score	Total
Reduction in number of point-source polluters	9	10
Reduction in illegal abstraction/uncontrolled irrigation upstream	8	10
Appropriate land use practices	7	10
Reduction in sediment load in rivers	6	10
Erosion control (terraces and gabions on roads)	6	10
Reduced planting of eucalyptus trees along the river	7	10
Afforestation efforts along river banks	6	10
Riparian land/ wetlands reclamation/protection	7	10
Reduced dependence on river water for domestic use	9	10
Reduction in watering of animals in the river	7	10
Average Score	7.2	10
WRUA's ability to deal with challenges	Score	Total
Challenges of lack of funding (WRUA's fund-raising abilities)	6	10
Involvement of all CMC members in WRUA's activities	7	10
Involvement of community stakeholders in the WRUA's activities	7	10
Involvement of all WRUA members in the WRUA's activities	8	10
Involvement of women in the WRUA's leadership and its core activities	9	10
Level of commitment from all management committee members despite lack of compensation for their time and efforts	7	10
Dealing with political interference	8	10
Resolution of conflicts	8	10
Average Score	7.5	10
Assessing the WRUA's SCMP's compliance with the WDC modules	Score	Total
Problem identification and prioritization	8	10
Mapping of point source and non-point source polluters	7	10
Mapping of illegal abstractors	7	10
Soil erosion control	6	10
Sub-basin conservation	7	10
Wetlands/riparian land conservation	7	10
Water use monitoring plan	4	10
Awareness creation on conservation issues	7	10
Water user compliance plan	4	10
Rights based approach (RBA) issues	5	10
Water resource and basin monitoring	7	10
Stakeholder participation & analysis	5	10
Over-abstraction monitoring and reporting	5	10
Water resource infrastructure development	5	10
Conflict management	7	10
Water abstraction data collection	6	10
Financial management	7	10
Deforestation control	7	10
Institutional development and collaboration	6	10
Water demand and water balance	4	10
Water allocation plan	4	10
Basin's water resources mapping	7	10
Water demand management	6	10
Average Score	6.0	10
Assessing the WRUA's roles in line with the principles of Integrated River Basin Management	Score	Total
Strategic River Basin Planning	8	10
Integration of Functions	6	10
Coordination	6	10
Institutional Arrangements	6	10
Capacity Building	6	10
Scale	7	10
Stakeholders Involvement	7	10

Review Items	Score	Total
Prioritization	7	10
Timing of Actions Plans	5	10
Accountability	8	10
Monitoring and Reporting	7	10
Average Score	6.5	10
Role of WRMA in supporting WRUAs towards implementing the WDC process	Score	Total
Assistance in development of the WRUAs and SCMPs	9	10
Capacity building of WRUA CMC members to be effective	8	10
Technical support to WRUAs during implementation of their SCMPs	9	10
Financial support to WRUAs during implementation of their SCMPs	6	10
Monitoring and evaluation of WRUAs activities	9	10
Support the WRUAs in development of proposals for funding	9	10
Support WRUAs in developing TORs and other contractual matters pertaining to the recruitment of SOs	9	10
Support quality improvements in SCMP development and implementation	8	10
Undertake desk and field appraisals of WDC applications and forward to WRMA National Office	8	10
Coordination of efforts by WRUAs within one sub-basin	5	10
Pre-qualify and induct SOs	8	10
Coordinate the WDC applications to WSTF	8	10
Mobilize resources for the WDC process	6	10
Review procedures and strengthen quality of the WDC process	8	10
Audit compliance to WDC systems	9	10
Average Score	7.9	10
Role of WSTF in supporting WRUAs towards implementing the WDC process	Score	Total
Mobilise resources for WDC	6	10
Appraisal and approval of project proposals	7	10
Monitor implementation of funded projects	9	10
Audit compliance to WDC systems.	9	10
Average Score	7.8	10
Summary	Score	Total
General issues related to the WRUA, SCMP and WRUA CMC	7.0	10
WRUA's performance in implementation of funded activities	8.3	10
Improvements in the state of the environment since the WRUA started implementing the funded activities	7.2	10
WRUA's ability to deal with challenges	7.5	10
Assessing the WRUA's SCMP's compliance with the WDC modules	6.0	10
Assessing the WRUA's roles in line with the principles of Integrated River Basin Management	6.5	10
Assessing the roles of WRMA in supporting WRUAs towards implementing the WDC process	7.9	10
Assessing the roles of WSTF in supporting WRUAs towards implementing the WDC process	7.8	10
Average Score	7.3	10

6. Conclusions and Recommendations

Conclusions

Based on the research carried out on the Kuywa WRUA, it can be concluded that the WRUAs are having a major impact on the conservation of their sub-basins. However, issues of lack of technical capacity and limited funding threaten to derail the otherwise good work being carried out by WRUAs.

Further, from the research, it can be concluded that the WRUAs' roles are generally in line with the principles of Integrated River Basin Management. Key principles of Integrated River Basin Management such as Strategic Basin Planning, Scale, Participation, Prioritization, Timing, Accountability, Monitoring and Reporting and Adaptation to Changing Circumstances, were all evident in the roles of the WRUAs as represented in this research on the Kuywa WRUA.

The following conclusions can also be deduced from the findings of this research:

(i) The WRUAs are still struggling with capacity especially with respect to human resources. Some of the leaders are

not well educated and therefore their capacity to drive the vision of the WRUAs is limited;

- (ii) The WRUAs have developed their SCMPs with well outlined plans but they lack funding. For the Kuywa WRUA for instance, the last time they received funding was in 2013,
- (iii) The WRUAs are led by elected officials who serve on voluntary basis with no compensation for their time input. This leads to low morale and motivation;
- (iv) The WRUAs' ability to enforce compliance is limited since they don't have prosecutorial powers;
- (v) Government's investment in water resources management has been weaker compared to its investment in water supply and irrigation development. This might not be as a result of weaker polices on water resources management but just a case of lack of prioritisation;
- (vi) Various government institutions dealing with water and natural resources management are currently not coordinated. The result has been duplication of efforts and conflicts arising from overlapping mandates;
- (vii) The lack of coordination amongst WRUAs within the same basin is a major hindrance to achieving a basin-wide approach to Integrated River Basin Management.

Recommendations

The following are the recommendations on the way forward:

- (i) The WDC should provide for enhanced capacity building trainings for WRUA leadership committees in aspects such as financial management, procurement, and monitoring and evaluation. Exchange programmes, which are already provided for in the WDC manual, should be enhanced and financed so that the WRUA leadership can gain valuable lessons from their successful peers;
- (ii) Both the national and County governments should prioritize the conservation of water and natural resources and allocate sufficient funds towards the same in their annual budgets;
- (iii) The WDC process needs to be reviewed to hasten the process of application for and receipt of funds from WSTF by the WRUAs, in order to increase uptake of available donor funding within the specified window periods;
- (iv) There is need to come up with mechanisms for compensating the WRUAs leadership teams especially the members of the Central Management Committees and the technical committees for their expertise and time input into the operations of the WRUA. This will attract more qualified personnel to participate in the WRUAs activities thereby enhancing the technical capacity of WRUAs to deal with issues affecting the sub-basin;
- (v) There is need for a new regulatory framework which accords the WRUAs more powers to apprehend offenders in their efforts to enforce compliance. WRMA's capacity also needs to be enhanced so that they provide better oversight to the WRUAs towards enforcing compliance.
- (vi) There is need to institute an inter-ministerial council for coordination of the various Government organizations dealing with water and natural resources management. This body will be charged with harmonising the operations of various institutions to eliminate duplication of efforts and conflicts arising from overlapping mandates. The inter-ministerial council should come up with an ordered, harmonised documentation of all government legislations dealing with natural resources management, to establish which law takes precedence in case of conflict.

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