Functioning of Sanya-Kware sub-catchment water users association in water resources management. A Case of Sanya-Kware Sub-catchment, Tanzania

ROLE OF WATER USERS ASSOCIATION IN WATER RESOURCES MANAGEMENT: A CASE STUDY OF SANYA-KWARE SUB-CATCHMENT, TANZANIA

Abstract

Many African governments have adopted decentralization policy by establishing water management structures to assist in the water resources management. Formation of water user associations are considered can help solve water conflicts(Hanging), collect user fees and manage allocation between competing uses. However, it is not clear how the new water user associations functions to realize the goals of integrated water resources management. This study assessed the functioning of a newly created water user association in Sanya-Kware sub-catchment . The paper is based on three months of research in Sanya-Kware sub-catchment, Tanzania. The method used included semi-structured interviews, focus group discussions and participant observations in the sub-catchment. Interviews and discussions were held with the leaders of Sanya-Kware sub-catchment water user association, estates farm managers,Water Supply Trustees Managers,farmers and the Pangani Basin Water Office staff. Field observations were carried to enhance quality of data. The results shows that the newly created Sanya-Kware sub-catchment water user association has not united all water users, reduced conflicts, nor promoted education to farmers on proper management of water resources. Farmers interviewed in the highland state that Sanya-Kware water users association is an association of few people and therefore has no legitimacy. This is mainly because in the highland,farmers have sufficient water and also they were not properly involved in the formation of the association. However, the water user association legitimacy and hence its functioning improves as one moves from highland to lowland areas where water is scarce. Although some of the water users from the village cooperating others are reluctant to accept(Hanging). The complexity of the interaction between the state-led water user association and existing water users appear to highlight the challenges of implementing integrated water resources management in Sanya-Kware sub-catchment. In order for the water user association to be effective, Pangani Basin Water Board need to put more emphasis on water users' education and awareness training at the sub-catchment level.

Keywords: C/*conflict resolution, water user association,Sanya-Kware,legitimacy,IWRM*

INTRODUCTION

The increasing competition over water observed in many river catchments in S/sub-Saharan Africa puts additional demands on water institutions, and their capacity to reconcile competing claims. One response by governments is the formalization of the property right to water. Formalization includes; the registration of water uses and users, the issuing of water rights or water permits to users, the levying of an annual water tax or water fee on permit holders, and the creation of formal organizations of water users sharing a common water source, often called Water User Associations (WUAs) (Van Koppen 2003)(Archaic). Therefore many African governments have adopted decentralization policy as a strategy for

water management structures that allows users to participate in the management of water resource.

The policy and practice of freshwater resources management have evolved to embrace the principles of integrated water resource management (IWRM) over the past half-century (Subramanian et al. 1997(Archaic), Brown 2011(Archaic), van Koppen et al 2016). These changes have been largely in response to the issuance of principles at the 1992 Dublin Conference on Water and Environment that: recognized water as a finite resource; advocated a participatory approach to water management; heralded the importance of women in provision, management and safeguarding of water; and established the economic and social value of water resources. The IWRM narrative also promotes three concurrent goals of equitable access to water resources, environmental sustainability, and economic efficiency of water use (van Koppen et al. 2016).

In terms of IWRM, WUAs may not equitably engage or represent all water users in a basin, especially smallholder farmers who dominate much of rural water use in Tanzania, given existing discrepancies in administrative capacity among stakeholders (van Koppen et al. 2016). Some studies suggest that the formal structure of WUA benefits those with experience navigating administrative processes and paperwork over those that are more accustomed to traditional resource management, like many rural residents (Sokile and van Koppen 2004(Archaic), Komakech and van der Zaag 2011(Archaic)). Similarly, the formalized processes of WUAs may not always be aligned with the need for flexible decision making for smallholder farmers reliant upon irrigation water (Sokile et al. 2003(Archaic), Sokile and vanKoppen 2004(Archaic), van Koppen et al. 2016). Several studies have examined ability and willingness of stakeholders to pay water fees and have found water fees difficult to enforce because of limited data on water resources; WUAs have not generally succeeded in bringing water abstractions in line with allocations (Maganga et al. 2004(Archaic), Mehari et al. 2009(Archaic)).

Worldwide, many case studies offer mixed results with regard to the functioning of WUAs and outcomes related to irrigation development (e.g., Groenfeldt and Svendsen 2000; Meinzen-Dick et al. 2002; Uphoff and Wijayaratna 2000) (Archaic). Most of those case studies do not fulfil the conditions for a rigorous comparative evaluation of WUAs, particularly as they use varying indicators to assess WUA performance (Senanayake et al. 2015). These indicators range from agricultural production factors to water fee collection rates and equitable water distribution. The wide range of indicators show that different kinds of assumptions are made on how WUAs are expected to function and what defines a successful WUA.

More recently, several reviews on WUAs have tried to put forward more conclusive insights on the impact of WUAs on irrigation performance by analyzing a large number of case studies (Garces-Restrepo et al. 2007; Ghazouani et al. 2012; Mukherji et al. 2009; (Archaic)Senanayake et al. 2015). However, their achievements remains unclear. Reviews show that, in most cases, WUAs do not live up to the expectations of water administrators, public decision makers and donors who initiated the establishment of WUAs. Some reviews primarily point to causes of failure such as the poor implementation and unclear formulation of the roles and responsibilities of WUAs (Garces-Restrepo et al. 2007(Archaic)). Other reviews focus on critiquing the assumptions behind the WUA concept and question whether WUAs are the most appropriate institutional arrangement to improve irrigation performance (Mukherji et al. 2009(Archaic)).

Donors and policy makers turned to the development of national-level legal instruments to regulate WUA operations to make them more effective. In some cases, donor agencies push national governments to put forward desirable WUA regulations that enforce the 'norms' in conventional WUAs, including cost recovery and user participation based on principles of equity. For example, in Malawi, the National Irrigation Policy and Development Strategy of 2000 included the preparation of WUA regulations to be adopted by the national government for broad roll-out in schemes (World Bank 2015a). Kenya, Ethiopia and Tanzania have recently introduced national-level policies or legal instruments. Mozambique also approved national regulations for WUAs in 2015 (Mwamakamba et al. 2017).
In Kenya, the Water Act 2002 legally recognizes WUAs, defined as 'community projects' allowed to apply for a water permit at the water authority when at least two-thirds of the people occupying the area are WUA members (Kemerink et al. 2016). Ethiopia issued the Irrigation Water Users' Proclamation in 2014 that recognizes WUAs as a unique legal entity primarily responsible for the O&M of irrigation systems (Haileslassie et al. 2016) and demands mandatory WUA membership of all users of the system.

Tanzania's National Water Policy of 2002 and Water Act of 2009 also provides a legal basis for the formation of WUAs, which can be established by a majority of users of a common waterway.In Tanzania, the mandate of WUAs is to apply for a user permit, allocate water among its users, resolve water conflicts and collect water user fees on behalf of the river basin organization (Komakech and van der Zaag 2013(Archaic)). Generally, the formalization of WUAs in national regulations officially aims at strengthening community-based irrigation management through WUAs, but often entails more state regulation, e.g., requiring water use permits (Lein and Tagseth 2009(Archaic)). Hence, codifying WUAs may also set the foundation to illegalize previously tolerated water use by smallholders (Harrison and Mdee 2017; Kemerink et al. 2016).

CONCEPTUAL REVIEW OF WATER USERS ASSOCIATION

The current status and trends of freshwater management in Tanzania—including those related to WUAs and stakeholder participation—were influenced by numerous political and social shifts over the past century. Precolonial water governance in Tanzania typically followed customary laws and aligned with the needs and realities of indigenous water users (Komakech et al. 2011) (Archaic); in many cases, mwene (local chiefs) oversaw rotation-based water-sharing systems at the sub or village level (Mehari et al. 2009) (Archaic).

In the 1990s, international donor agencies advocated again for participatory water management within the Integrated Water Resources Management (IWRM) paradigm. IWRM stands for a holistic approach to water management, with stakeholder participation in decision-making processes regarded as an important pillar. Following the global push for IWRM with the 1992 Dublin Principles, more than 40 governments from developing countries incorporated IWRM principles in their water policies (Hassing et al. 2009) (Archaic). Consequently, governments did not retreat from the WUA approach, but increased expectations of WUAs "to play a critical role in promoting the IWRM reform at the community level" (Hu et al. 2014: 163). Hence, IWRM reforms consolidated the popularity of the WUA approach by public institutions, donors and development project implementers.
Tanzania is now one of many countries that endorses the concept of integrated water resources management and development (IWRMD) and adheres to the Dublin Principles (van Koppen et al. 2016). These principles—and especially a focus on stakeholder or public participation in freshwater resources management—are manifested in the three main pieces of

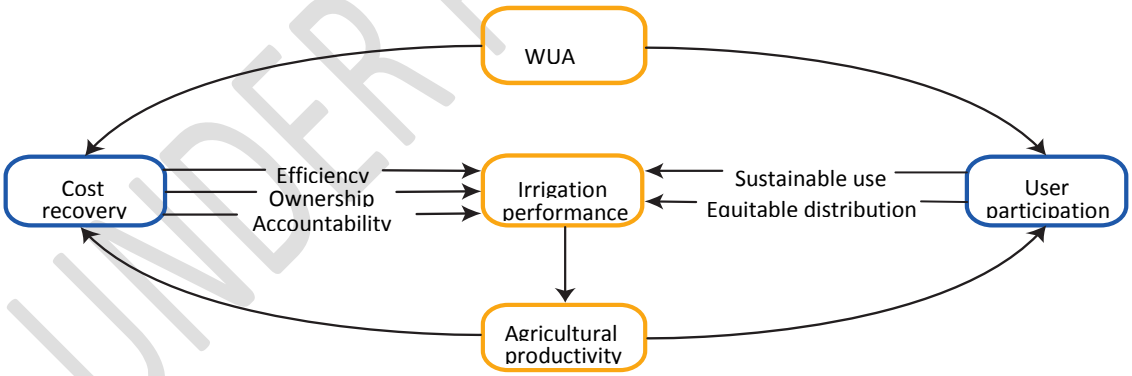
Tanzanian freshwater governance: the NAWAPO of 2002, the National Water Sector Development Strategy (NWSDS) of 2006, and the WRM Act of 2009.

Assumptions Underlying the WUA Concept – A Global Assessment of Theory and Practice

WUA main tasks include; the allocation of water within the irrigation system, operation and maintenance (O&M) of the system and the cost recovery of O&M through the collection of irrigation fees from its members.The two main narratives underpinning the mainstream WUA concept are full cost recovery of O&M and user participation (Figure 1). The cost recovery narrative implies that the performance of the irrigation system will improve when water users in an irrigation scheme fully pay the costs of infrastructure investment and O&M. The user participation narrative implies that the performance of the irrigation system will improve when users participate in the decision making on, and hands-on management of, the irrigation system.

It follows that improved irrigation performance should then lead to increased agricultural productivity (i.e., extended irrigated area, and increased irrigation efficiency, cropping intensity and higher yields), which will create a positive feedback loop on the water users' ability and willingness to recover all costs and participate in management. Because cost recovery and user participation are supposed to enhance irrigation performance, the feedback loop is strongest when both conditions are met. Hence, cost recovery and user participation are considered to be interdependent. Often the two are discussed together, but they are presented in Figure 1 separately to emphasize the different assumptions underlying each condition.

Figure 1:Theoretical framework of WUAs



Cost recovery – in theory

The cost recovery narrative is backed by the widespread conclusion of researchers, policy advisors and development organizations that poor performance of state-managed irrigation systems causes the deterioration of irrigation infrastructure (Huppert et al. 2003; Suhardiman and Giordano 2014) (Archaic). They perceive state management as being subject to a negative cycle of low cost recovery that leads to poor maintenance, and in turn to suboptimal irrigation performance and low agricultural productivity. Some analysts further argue that farmers benefit directly from irrigation projects, and should thus pay for O&M costs and a portion of the capital costs of irrigation systems (Easter and Zekri 2004) (Archaic). They posit that

entrusting water users with the responsibility of cost recovery will lead to the positive performance of irrigation systems in multiple ways, including the following:

1. ***Efficiency*** – Cost recovery through WUAs increases the efficient use of financial resources because water users are local experts who know the best and most necessary investments in O&M. Hence, water users are motivated to invest their money in more cost-effective solutions than external agencies that lack an incentive for financial savings or profit (Garces-Restrepo et al. 2007) (Archaic).

2. ***Ownership*** – Mandating WUAs to contribute labor and funds for cost recovery promotes their sense of ownership of the irrigation system (Mutambara et al. 2016). When water users experience strong ownership, this creates an incentive for responsible use of the irrigation system (Uphoff 1986) (Archaic). This, again, prevents rapid deterioration of the infrastructure and reduces costs (Huppert et al. 2003) (Archaic).

3. ***Accountability*** – As decentralized, member-based organizations, WUA members can best ensure that scheme management is accountable for providing quality services. Hence, internalizing the expenditure on O&M reduces losses due to inappropriate use of funds (Easter and Zekri 2004) (Archaic).

User participation – in theory

The user participation narrative of the WUA concept is strongly inspired by lessons learned from community-based natural resource management of common-pool resources in traditional systems. Research on numerous cases worldwide illustrated that the state is not essential as an external authority to set and maintain rules on natural resource management (Ostrom 1990) (Archaic). Strengthening user participation is expected to improve the performance of irrigation systems in various ways, particularly equitable distribution and sustainable use of water (Meinzen-Dick 1997; Ostrom and Gardner 1993) (Archaic), notably including the following:

1. ***Sustainable use*** – Collective institutions in traditional irrigation systems can assure sustainable use of common-pool resources over long periods of time by preventing unnecessary use and rapid depletion of water resources (Ostrom 1990). WUAs ideally provide a platform for water users to negotiate rules through bylaws that encourage sustainable collective water management and use over time, as observed in traditional irrigation systems (Meinzen-Dick 1997). (Archaic)

2. ***Equitable distribution*** – Collective institutions in traditional irrigation systems can assure equitable distribution between upstream and downstream water users (Ostrom and Gardner 1993). Equity in the distribution of water is commonly formulated as one of the main objectives of WUAs, based on the notion that WUAs promote collective action (MeinzenDick et al. 1995; Wegerich 2010). (Archaic)

Irrigation performance feedback loop – in theory

Governments and donor agencies hold a primary expectation that irrigation management by WUAs will lead to increased agricultural productivity through improvements in irrigation performance (Garces-Restrepo et al. 2007) (Archaic). Furthermore, they assume that water users will be the first to benefit from an increase in agricultural productivity through rising incomes. The costs of irrigation may initially increase for farmers after IMT, but additional

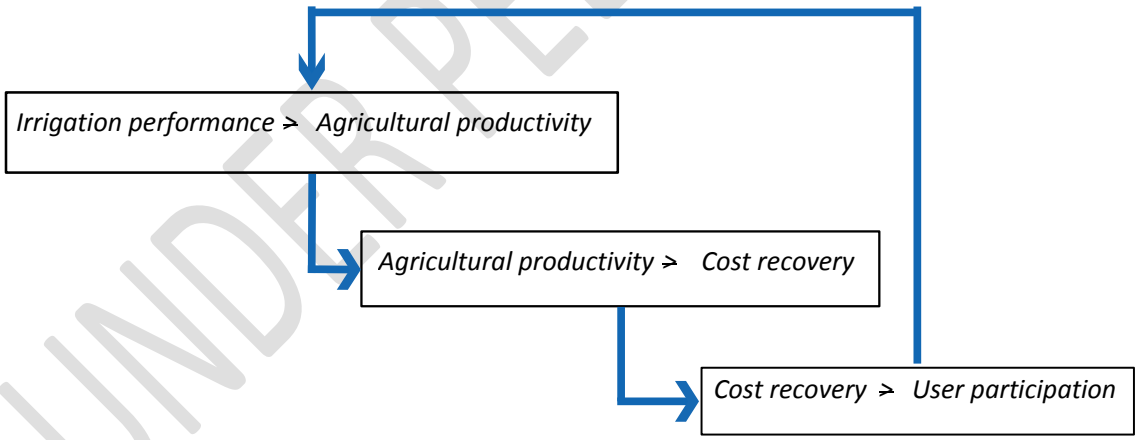
income in the medium- to long-term should balance the higher costs (Garces-Restrepo et al. 2007) (Archaic). This argument suggests the evolution of farmer incentives to pay for irrigation scheme services; farmers' increased income will enhance both the ability and willingness to contribute to O&M costs over time. A similar change in farmer incentives also applies to user participation in WUA management; increased agricultural productivity and income would give farmers an incentive to strengthen and extend their active participation in irrigation management (Meinzen-Dick 1997) (Archaic). This anticipated feedback loop depicted in Figure 2 is based on the following three circular assumptions:

1. ***Irrigation performance → Agricultural productivity*** – Irrigation performance is the weak link that keeps agricultural productivity low. Therefore, improving irrigation performance will lead to increased agricultural productivity.

2. ***Agricultural productivity → Cost recovery***– Irrigated agriculture is the primary source of income for water users. Therefore, agricultural productivity improvements (particularly increased cropping intensity and higher yields) will increase income and living conditions. Higher income will in turn enhance the ability and willingness of WUA members to contribute to O&M costs of irrigation schemes.

3. ***Cost recovery → User participation*** – An increase in cost recovery improves irrigation service delivery, as effective O&M improves water supply infrastructure and services. Improved irrigation services increase the confidence of users of the scheme, which generates WUA legitimacy and trust by farmers. Farmers will seek to increase their participation in the WUA.

Figure 2: Irrigation performance feedback loop for WUAs



Irrigation performance feedback loop – in practice

The impact of WUA management on agricultural productivity is extremely hard to prove due to the complexity and variety of factors intervening at the same time; even the most rigorous studies have not demonstrated a clear relationship (Senanayake et al. 2015). The complex linkages between yield, income, and technological developments such as irrigation have been subject to constant debate (Howlett 2008). Poorly performing WUAs may not be to blame for low agricultural productivity.

Mukherji et al. (2009) (Archaic) argued that, particularly in Asia and Africa, the state or development partners constructed large-scale irrigation infrastructure systems to achieve national food security or for other aims, not commercially viable, financially self-sustaining systems. From the outset, irrigation infrastructure has been optimized to secure specific food (or fiber) crop production, largely to support urban areas, and not designed to enhance individual farmer income that would enable full cost recovery. Changing the management approach to an irrigation system along with changing development goals or approaches will not automatically lead to increased agricultural productivity and higher farmer incomes.

RESEARCH METHOD

NOTES:

Qualitative Approach – Focus Group Discussions; Focus group discussions (FGDs) can be used as a tool to assess needs and enhance awareness in program development and evaluation, and thereby facilitate change processes. Focus groups enable people to ponder, reflect, listen to experiences and opinions of others, and interact. Therefore, for gathering qualitative data, FGDs can be planned and conducted in locations involving participants across basin. The team should have interaction with a group of invited participants and collected data.

Population and Sample

Indicate the population for the FGDs

Use a purposive sampling procedure to select the participants for the FGDs.

Show the sample for each focus group in a table

Design and Development of the FGD Instrument

Develop a FGD semi-structured questionnaire to maintain uniformity across all the FGDs in the basin. The questionnaire should consist of open-ended questions.

At the beginning of each FGD, a moderator should explain the study purpose to the respondents and obtained verbal consent, including consent for audio recording.

Written informed consent also is to be obtained from the FGD participants.

The notes and audio/Zoom recordings can be transcribed shortly after the sessions.

The facilitators of each focus group should encourage participants to think critically and speak honestly, and freely about their experiences with and perceptions of during the discussions.

A member should serve as facilitator,

Another member document the discussion, and

The third conduct independent data method for quality assurance.

FGDs Data Analysis

Despite the long history of focus group research, it lacks a proper guide that delineates the types of qualitative analysis techniques for focus group research. Analyzing FGDs data is much more complex than analyzing data from an individual interview, but an array of qualitative analysis techniques is available to qualitative researchers.

A method called constant comparison analysis, also known as the method of constant comparison, which was first used in grounded theory research is an example. This is used as one best way to analyze transcripts of interviews.

Constant comparison analysis consists of four main steps:

1. Inductive categorization,
2. Refinement of categories,
3. Exploration of relationships across categories, and
4. Integration of data.

This study should adopt a modified approach of the constant comparison analysis. Example:

1) The first step should involve carefully reading and reviewing all the transcripts of all FGDs conducted to familiarize researchers with the content,

2) The second step is to identify themes,

3) In the third step, a color code is to be developed and highlight the context within the transcripts based on the themes,
4) The fourth step is highlighting the statements that resonated with each of the themes and categorize them.
The objective of this research was to describe and analyse the functioning of a newly created water users association in management of water resources.The methods used included; semi-structured interviews, focus group discussions and participant observations in the sub-catchment. Interviews and discussions were held with the leaders of Sanya-Kware sub-catchment water user association, estates farm managers,Water Supply Trustees Mangers and the Pangani Basin Water Office staffs. Field observations were carried to enhance quality of data.The paper also draws from grey literature obtained from the Pangani Basin Water Office (PBWO).

CASE STUDY: THE SANYA-KWARE SUB-CATCHMENT

This paper introduces the Sanya-Kware sub-catcment and then describes and analyze the functioning of a newly created water users association in management of water resources.

Biophysical and socio-economic context

Sanya- Kware sub - catchment is covering parts of Hai and Siha district, comprising of 18 administrative wards with estimated total population of about 2,164,890 according to census conducted in 2002.It is among of the four sub- catchments of Kikuletwa catchment. Sanya Kware sub catchment can be divided into four agro-ecological zones. Forest zone (above 1800m above sea level) comprising a government gazetted forest reserve. The area experiences rainfall above 2000mm. Land use is mainly for the forest reserve and Kilimanjaro national park.

In the highland zone (1600-1800m above sea level) having a relative cold climate with a rainfall between 1250 -1750mm per annum. Land is mainly used for subsistence agriculture (Major crops are coffee, sugar cane, banana, vegetables, beans and pigeon peas). Livestock are stalled mainly for dairy cattle. Water is used for domestic, irrigation and livestock.The area is mostly populated due to favorable climate and fertile soil. Ethnic groups are mainly the Chagga.

The mid-highlands (900-1660m) with a rainfall between 700 -1250mm per annum, land is mainly used for, commercial activities, subsistence agriculture and livestock keepers.Seasonal crops grown are; maize, beans, sunflower and pigeon peas. Short rains are important for coffee and banana farming. Export flowers are also grown. Coffee and flowers are grown under large estates owned by Private investors. Currently, there is high competition over water needed for production between the small scale farmers and large estates. Ethnic groups are mainly the Maasai who are the livestock keepers and the Chagga.

In the lowland (below 900 above sea level) having warm climate with a rainfall between 400-700 mm per annum. The land is mainly used for subsistence agriculture and livestock keeping. It receives low rainfall, highly affected by upstream water use. Major crops grown are onions, vegetables, maize and rice. Livestock are free range, mainly owned by pastoral Maasai migrated from Simanjaro and Hai district.

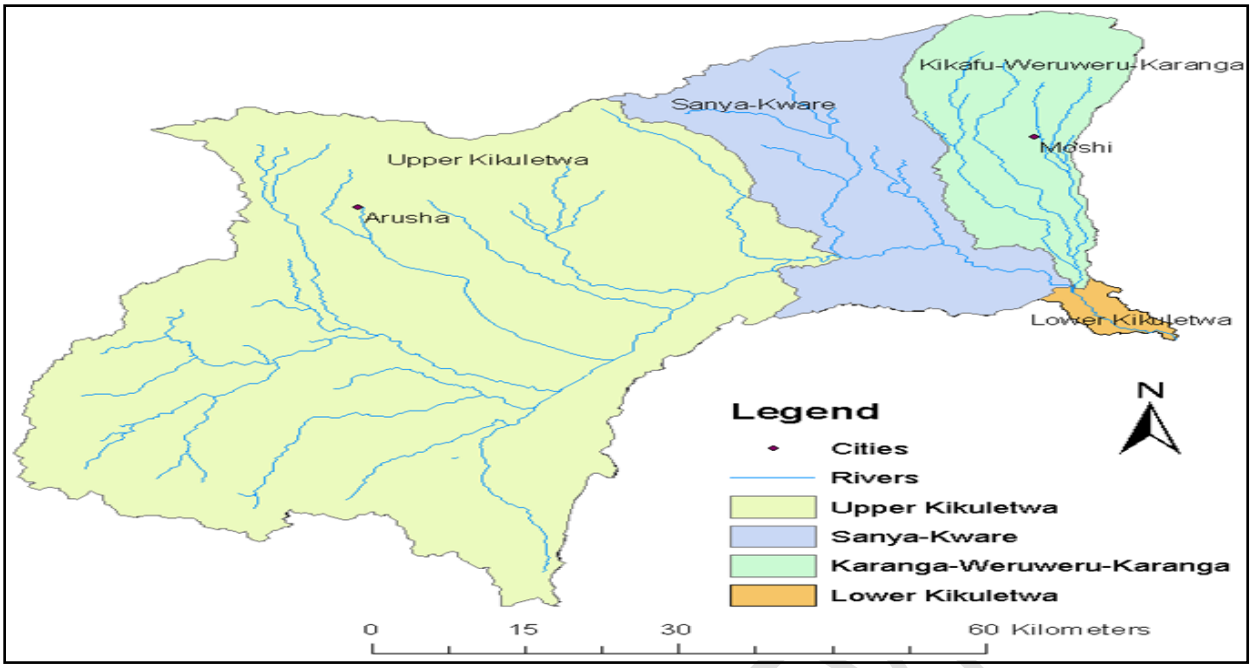


Figure 3: A map of Kikuletwa catchment with sub catchments in the Pangani basin.Source:

PBWO (2012).

Process and formulation of Sanya-Kware sub-catchment water users association

Sanya-Kware sub-catchment water users association have been formed by PBWO (Full then, abbreviate) as provided for in Water Resources Management Act No. 11 of 2009 as a result of National Water Policy (NAWAPO, 2002) which introduced the decentralization policy for WUA to work on behalf of Basin Water Boards; To collect water user fees,to manage, distribute and conserve water from a source used jointly by the members of the association, to resolve conflicts between members of the association related to the joint use of a water resource through established laws, to protect and conserve water sources and environments, to acquire and operate any Permit under the provisions of the Act and manage allocation to meet the IWRM principle in water resources management.

Process of WUA formation started in 2009 as a result of a meeting held through wards district committee, where 2 members from each village were appointed to attend the meeting then these appointed members elected 6 members to form executive committeof Sanya-Kware sub-catchment water users association. These elected members were to prepare WUA constitution. On november,2010 Sanya-Kware sub-catchment water users association was officially formed (PBWO,2012).

Sanya-Kware sub-catchment Water Users Association Structure

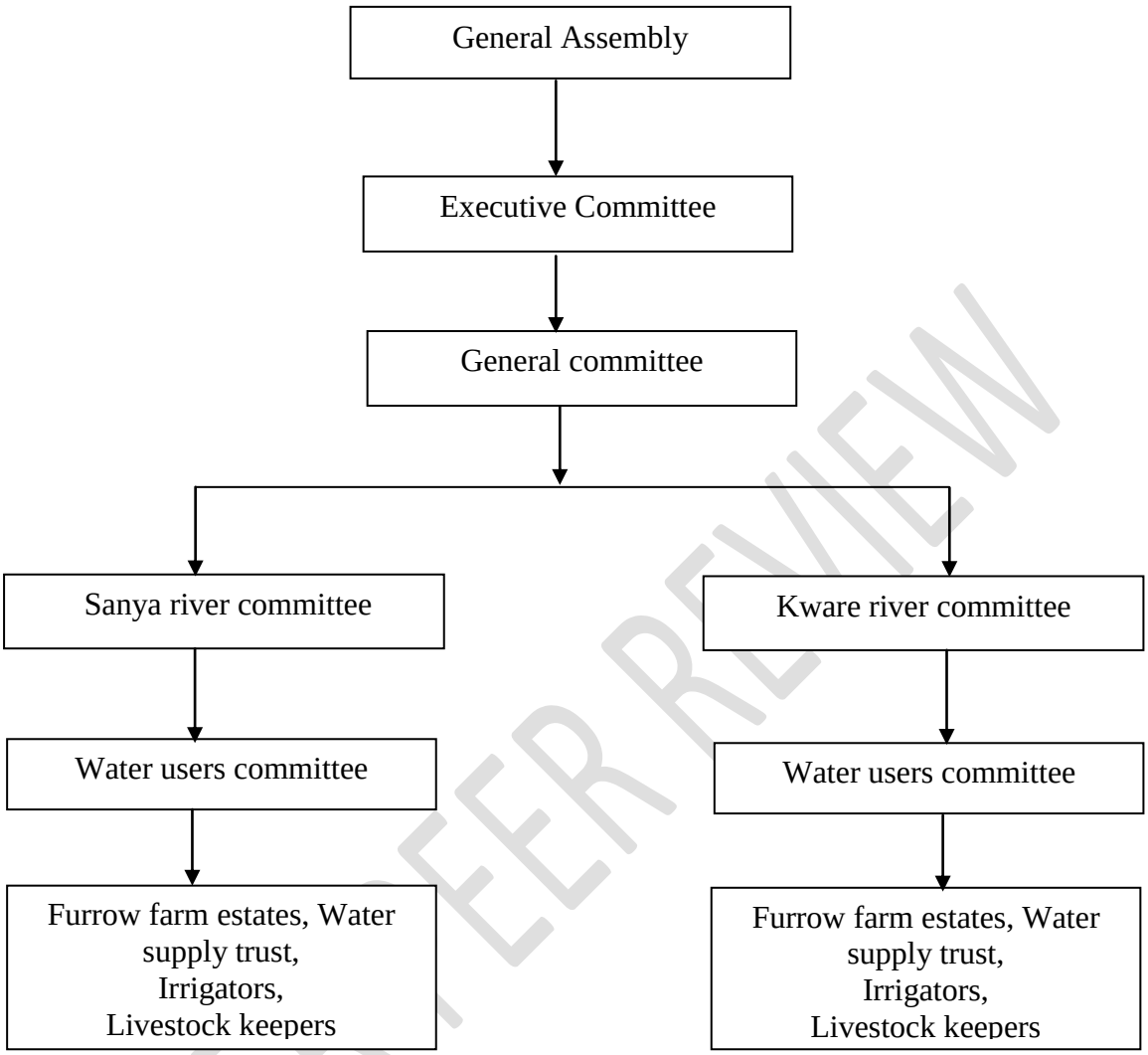


Figure 4: Proposed institutional arrangement of Sanya-Kware-Sub-Catchment water users association

General Assembly

This is the general board consisting of all members formingSanya-Kware sub-catchment water users association . The assembly meets once per year, The main duties of the general assembly is to elect 6 members of the executive committee, to discuss and approve financial statements of the association, to review and approve by laws, policy and principles governing water use and conservation of water sources, to remove any leader found to be weak in the committee and to approve all members representing rivers committee. The meetings of general assembly are chaired by the chairperson ofSanya-Kware sub-catchment Water Users Association .

Executive committee

This organ comprises of chairperson, vice chairperson, secretary, treasure and other 2 members. Members of the committee are elected at the general assembly or meeting based on gender consideration. The main task of the committee is to employ new members, removing

members from the association found to be weak and settling disputes among members. Other duties are, to prepare and organize meeting forum, to discuss development issues concerning the association, to plan and approve revenue and expenditure of WUA, to open and protect bank account of WUA, to prepare, sign and guide all contracts of the association, to ensure there is equity in water allocation among water users and to approve and take all decisions made by the general assembly.Sanya-Kware sub-catchment water users association main sources of funds are annual water fees, NGOs, government, membership entrance fee, penalties and funds from Pangani Basin Water office.

General committee

The committee has 60 members from 2 river committees representing Sanya and Kware rivers. Other members not more than 6 from executive committee enter the committee with their positions. The general committees are led bySanya-Kware sub-catchment water users association chairperson, vice chairperson, secretary and the treasurer. The main task of the committee are to receive and discuss different reports from the executive committee, to give out guidelines and responsibilities to the river committees, to prepare reports for the general assembly and to give out report to the executive committee.

River committee

These are the two branches of Sanya- Kware sub catchment. Their numbers comprise of 60 members. Each branch has 30 members representing the upstream and downstream part and 1/3 of all members should be women. These committees will be chaired by a chairperson and secretary who will be elected after every 3 years.

The main task of the committee is to allocate and manage water uses among users in the rivers concerned, to form other small committees to manage rivers, to encourage all water users to participate in all activities of the association, to prepare and give out the report to the executive committee concerning financial affairs, to approve revenue and expenditure of Sanya-Kware sub-catchment water users association funds, to prepare river committee budget and forward to the executive committee for the approval, to solve water use conflicts among members, to cooperate with village governments in implementing laws for better management of water resources, to ensure water allocation is done according to the availability of water resources and to implement all instructions from the general assembly and executive committee but currently river committees have not been put in place at the sub catchment.

Water users committee

The members of the committee are from different water user groups such as farm estates, water supply trustees, domestic users, irrigators, livestock keepers and traditional furrows. Each group has 2 members to represent them in the water user committee. The main tasks of the committee are to prepare the budget and forward it to river committee, to encourage members to participate in the activities of Sanya-Kware sub-catchment water usersassociation, to prepare and give out report to the river committee, to implement laws and ensure all rules are followed in water allocation, to solve water use conflicts among members, to discuss and approve financial statement of the group, to collect annual fee from different areas of water source, to arrange timetable for water allocation to farmers, to cooperate with village governments in implementing laws for managing water resources, to ensure membership fees are paid at the right time at the right place and to ensure during the dry season water is allocated according to the available water.

Roles of Sanya-Kware sub-catchment water users association

The primary roles of Sanya-Kware sub-catchment water users association are;to identify all water users with and without water use permits, to protect the interest of all water users , to manage and follow up the water uses as provided by Pangani Basin Water Office, to advice Pangani Basin Water Office on issuing new water use permit, to protect and manage all water sources such as rivers, springs, swamps, wells, piped water and the environment at sub-catchment level.

Other roles are; to collect water fees from all water users on behalf of the Pangani Basin Water Office, to solve water conflicts among water users, to bring awareness and ensure that all water users protect, conserve and manage water resources, to take precautions during the dryseasons when there is water shortageby advising Pangani Basin Water Office in allocating and distributing water to the farmers according to the water availabilityin thesub -catchment.

Box 1. Laws governing Sanya-Kware sub-catchment water users association in water allocation and management

Bylaws governing water allocation and management among water users are as follows:

All water users must register with the WUA and pay a membership fee of TZS20,000 to the WUA,Farming near water source charges are 100,000 TZS, destruction of furrows or piped water charges are 200,000 TZS, failure to attend the work of WUA without any reason charges are 10,000 TZS, cutting down of trees at the water source charges are 15,000 TZS, grazing of livestock at the water source charges are 2,500 TZS, disposal of rubbish at the water source charges are 500,000 TZS, illegal abstraction of water from the furrow charges are 300,000 TZS and over abstraction of water from rives charges are 100,000 TZS.In addition ,The Sanya-Kware water users association committee also has duty to collect water user fee from water users as which include; Annual water user fee for a group of water users must pay 20,000TZS, annual water user fee for social institutions must pay 20,000 TZS and annual water user fee for large institutions using more water like farm estates or commercial water users must pay 150,000TZS.

Source: PBWO (2012).

Challenges of Sanya-Kware sub-catchment water uses association in water resources management

- WUA lack technical and financial support to operate and have been facing a lot of difficulties in collecting water user fee especially from large water users like farm estates.
- Currently only few traditional furrows have been registered as members of WUA, the remaining traditional furrows have not been registered and continue with their traditional institutional set up in managing furrows.
- The new water users association is not recognized by farmers because formation of WUA started at the ward level meeting where the committee was formed. It did not

start at the grass root level in the villages and the local community did not participate fully in the formation because it was a top down approach.

- They have failed to identify boundaries of Sanya- Kware sub -catchment which could help them in identifying all water users and involve them in water allocation and collection of water user fee from them.

- Low awareness of the local community gives them difficult work to provide education and awareness on how to use water in a sustainable manner.

- Farming at steep slopes by farmers in Sanya-Kware sub-catchment is also a challenge to them in conservation and management of water sources .

- Political interference is an obstacle to them especially from the village governments. Village executive officers, district commissioner and ward executive officers do not cooperate with them in allocation and management of water resources.

WUA attempts in resolving water conflicts in the sub-catchment

- In 2011 in Ng`uni village a conflict between village chairman and traditional furrow committee occurred. (Participatory Agricultural Development and Empowerment Project (PADEP) gave out funds for rehabilitation of Kyeeyo furrow in the village but money given out was misallocated by the village government and did not finish the intended work. The traditional furrow committee complained that money was spent badly by village chairman, WUA had to intervene and organize a meeting, both sides were brought to the table for the negotiations and agreement was achieved and conflict was solved.
- A second conflict was at Kware village involving upstream users who closed an irrigation furrow and made the downstream users to suffer. The defaulters were taken to the court and ordered by court to pay for the crops affected due to water shortage but the defaulter failed to pay, instead appealed again to the court and claimed that they had right to use the water. The court ordered the case to be handled by WUA. They were again ordered by WUA leaders to open the furrow but they refused and the case still goes on and WUA leaders have failed to solve the case.
- Thirdconflict was at Rundugai village where WUA leaders went to introduce themselves to the Rundugai village government to provide education and awareness to the local community on proper allocation and management of water resources but surprisingly they were not welcomed well which made their relations with the community more vulnerable. A conflict between Mkalama and Rundugai villagers still exist, upstream users getting support from Rundugai village government and usually broke the distribution box at Mtambo furrow and direct more water to their farm leaving less water to flow to the downstream users at MkalamaVillage.
  WUA leaders have tried to negotiate with the upstream users but they have been rude and reluctant, hence the conflict is still unsolved up to date. WUA leaders again caught a water pump being used by a farmer at Rundagai ward and took him to the village executive committee but no punishment was given to him. Rundugai village government tends to support farmers who use water pumps and farmers continue using water pumps without any fear and do not want to hear anything about WUA laws because they only follow village by laws.

Box 2.Boloti swamp conflict at Kyuu village

People staying near the swamp prepare illegal alcohol which is the traditional one "Gongo". WUA chairman went to observe and saw them, reported to the police and one brewer was captured. He was taken to court and jailed for 3 years.Farming and grazing of livestocks still takes place near the swamp.

WUA have tried to provide education and awareness to the villagers to stop from misusing the water swamp by farming in the swamp and preparing illegal alcohol.WUA also prepared a meeting on 2012 attended by the Kyuu villagers, village chairman, PBWO, WUA leaders and district commissioner and they came up with the agreement that people should leave the swamp but the problem still continues up to date.

Source:PBWO

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Functioning of other Existing Water arrangements at Sanya-Kware sub- catchment:

Box 3. Statement from WUA chairman, Mr. Frank Kimaro about the Boloti swamp conflict

I have been educating the community for years now to stop cultivating and grazing livestock at the swamp but some politicians at the village level encouraging people to continue cultivating and grazing livestock. Mr. Kimaro promised never to stop doing his work. In addition Pangani Basin Water Office has been cooperating with WUA to solve the cofilict at Boloti but the local community at Kyuu village is reluctant to cooperate on how to managethe swamp in the sub-catchment.

Water allocation and management by water supply trustees

In Sanya-Kware sub-catchment there are four water supply trustees abstracting water from the rivers and natural springs so as to supply safe and clean water to the people in Hai and Siha districts. These are Lawate Fuka water supply Trust(LFWS) , Uroki-Bomangombe water supply Trust (UBWST), Mkalama Water Supply Trust (MWST) and Magadini Mwakiwelo water supply trust (MMWST). Their aim are to make sure people get safe and clean water at affordable price for 24 hours and 366 days per year and water service should not be far from the residents. They have introduced tariffs to different water users which are public tap charges, institutions charges and commercial water users' charges.

In abstracting water from the water sources located in the villages, the water supply trustees have been facing a lot of challenges from the local community and conflicts normally occur in water allocation. For instance the conflict at Mese village where the upstream farmers have closed Nanguriri spring with mud soil and this has affected water flow to Lawate Fuka intake. Also Lawate Fuka water pipes sometimes are being broken by upstream farmers to irrigate their farms.

They have tried to solve the problem by involving Pangani Basin Water officials, district irrigation officer, district water engineer and district commissioner with the villagers at Mese but still problem continues.WUA are now trying to negotiate with the water users at Mese village. The difference between water supply trust and farm irrigators is that Water supply trust considers all water users when supplying water but farm irrigators do not considers other water users instead they abstract water for irrigation purposes only.

"New water users association WUA has been formed and he also attended the process of WUA formation, argued that WUA leaders were given authority to identify all water users and bring them together, then to apply water laws in governing water resources but surprisingly conflicts are on the rise because they have no attendance of going physically to the all water sources and provide education and awareness to the local community. They need to identify all water users and come up with good strategies in solving conflicts rather than saying they lack fund and wait until problem arise then go to solve the conflict at the community."

Box 4. Statement from the Manager of Lawate Fuka water supply trust

DISCUSSIONS

Water allocation and management at basin level

The formal institutional arrangement for water resources management is clear on paper at the national to water user association level but on the ground the implementation is done arbitrarily. The Ministry for Water is directly linked with Basin Water Offices (through water resources directorate and national water boards). The catchment and sub catchment water offices are linking the basin water office with water users associations.

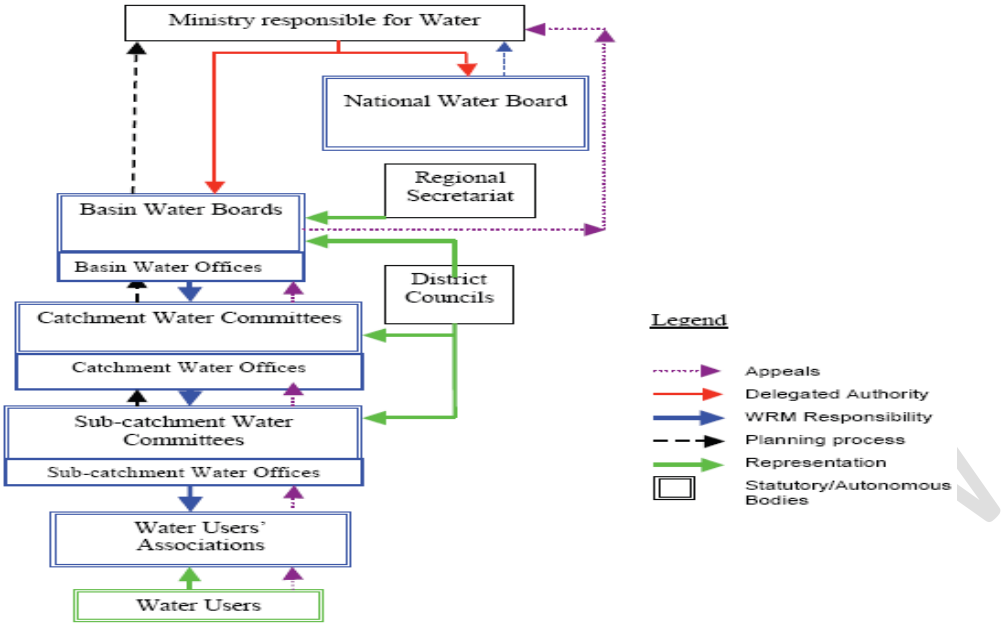

Figure 5: Current Institutional framework for water resources management in Tanzania. (Source: PBWO,2009)

Currently PBWO has direct linkages with WUA who have close linkages to the water users in the sub catchment. Other large water users like the farm estates and water supply trustees have direct linkages with the PBWO. At sub-catchment level currently wards and villages are involved in water resources management. They do not appear in the structure as they are not specifically formed for managing water although they have influence in water management considerably. The Ward District Council (WDC) and village government frequently passes bylaws that impact on sanction and penalties that seem to guide water allocations and quality of water. They are currently in charge of water resources management, although they are not operating on hydrological boundaries.

The Sanya-Kware sub-catchment WUA was registered by PBWO as provided for in Water Resources Management Act No. 11 of 2009. It was formed for the purpose of collecting water user fees on behalf of the Basin Water board (BWB), to resolve conflicts between members of the association related to the joint use of the water resource and manage, distribute and conserve water from a source used jointly by the members of the water users association.

However, WUA has failed to achieve these goals due to lack of good coordination with other institutions and power overlapping in water allocation and collection of water user fees. For instance, WUA have failed to collect water users' fees to a large extent because PBWO also still collect water user fees without incorporating WUA. This brings confusion and overlapping of duties between the two institutions. Traditional furrows and farm estates have water use permit and pay annual fee directly to PBWO these have made them to be reluctant to pay water user fee again to WUA.

WUA have only achieved to collect water user fee from few traditional furrows and farm estates in Sanya-Kware sub- catchment. In resolving conflicts WUA have been facing resistances from the water users because there is no good coordination with other institutions

like districts, catchment committees , sub catchment committees and village which were supposed to help WUA in giving out all the support in water allocation and resolving conflicts.

It is not clear how WUA are involved in decision making, allocation and resolving conflicts with the formed catchment and sub catchment committees' institutions as appearing in the structure of the Ministry of water. PBWO have issued out water use permit to the water users who are given certain amount of water flow (given in m3/s) but have failed to control the abstraction amount of water needed. This has led to conflicts among water users. For instance, the conflict between estates and traditional furrows has occurred due to poor monitoring of abstraction points by the PBWO.

Sanya-Kware sub-catchment WUA and its interface with other administrative systems

The new water users association though is still new in the sub –catchment, has succeeded to promote education and awareness on water allocation to the local community. In relation to other administrative systems, WUA have been facing a lot of resistance mainly due to conflict of interest. At ward level, wards executive officers and ward councilors were supposed to cooperate with WUA in implementing laws and principles for water resources management but it has been vice versa.

Some ward executive officers and ward councilors have been reluctant to cooperate, leaving WUA to operate by itself due in management of water resources. For instance, in cases of Rundugai ward, WUA has been getting negative response from the ward councilor whenever they want to involve the locals in proper management of water resources. At the highland area, the village governments are not willing to accept and work with WUA because they are assured with enough water for irrigation and other uses. Lack of representative members in WUA committee from the highland villages also has contributed to low response. In midland zone, some village governments have positive linkages and others negative linkages due to conflict of interest in water resources.

Areas with low conflicts among water users WUA has been having smooth cooperation but areas with serious conflicts WUA has been having low response from village governments. In the lowland, WUA has been having negative response because of the failure of former TEGEMEO water users association which proved to be weak in water allocation and this made village governments not to accept the new water users association . However, despite all the challenges Sanya-Kware sub-catchment water users association have been able to promote education and awareness on proper allocation of water resources, have reduced some conflicts and have managed to unite some water users including upstream and downstream users.

CONCLUSIONS

The new water users association is still new to the farmers or water users at the grass root level (villages) because they started at the wards level with the support from PBWO and were given authority to operate on behalf of PBWO according to the decentralization policy from the national water policy but had no enough funds to operate. This has weakened WUA to function properly. From the time of its formation in 2009 it has not achieved its goals. Collection of water fee especially from big water users like estates is still a challenge; conflicts are still increasing among water users.

WUA also has not achieved to identify the boundaries of Sanya- Kware sub-catchment and to unite all water users from highlands to lowlands. The mixed situation between traditional laws and IWRM laws also bring difficulties to WUA in water resources management. Currently, WUA has only achieved to register few traditional furrows and the rest of furrows are reluctant to join and pay annual fee to WUA.

However, despite of all the challenges WUA face, to some extent they have resolved some conflicts and were able to collect some water user fees at the sub -catchment level. If supported, the new water users association will improve its performance and able to meet the goals in water allocation and conflicts resolution among water users.

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