



PERFORMANCE OF WATER INSTITUTIONS IN ENHANCING WATER USER RIGHTS AMONG SMALLHOLDER FARMERS IN KIRU VALLEY TANZANIA

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ABSTRACT

Purpose: This paper intended to investigate the performance of water institutions using the primary roles of Water Resource Management.

Design/Methodology/Approach: The study employed a qualitative research approach through multiple sampling techniques and stages. The sample involved 70 respondents from the basin villages registered in WUA model. Data were checked by content analysis and descriptive statistical procedures.

Findings: The findings revealed that the primary roles of Water Resource Management (WRM) Act No. 11 of 2009 and institutional targets of formal and informal institutions are relevant and reflective towards enhancing water user rights in the valley. The WUA model seemed to have a better performance on water management in Kiru Valley, Tanzania.

Research Limitation: The limitation of this study was the overlapped policies and programs which restricted the definition of the institutional roles of the water institutions in the valley

Practical Implication: This information is useful for key actors in water management in formulating effective institutions to engage the smallholder farmers in water use on a large scale by targeting serious water institutions which attract them.

Social Implication: Policy makers should institute the WRM Act No. 11 of 2009 relating to WUA model to improve water user rights.

Originality/Value: This is a relevant study that seeks to develop an effective institutional performance framework to monitor the water use procedures of the stakeholders.

Keywords: *Institutions. performance. Tanzania. user rights. water.*



INTRODUCTION

Globally, water institutions have transformed as a means to increase the sustainability of the common pool resources including water (World Bank, 2015; Richards, 2019). In the developing world, (e.g., Africa) many countries have changed their water institutional governance and structures from a local to a formal based approach after the international water and natural resources conferences of the Ramsar Convention (1971), Dublin Principles (1992) and Global Water Partnership (2002). Since, water policies, acts and regulations were put in place to reform water institutions and uses for various countries as a way to promote an effective water resource. The new water reforms were undertaken in most developing nations as a global water requirement of a Global Water Partnership (GWP). Formal water institutions aim at enhancing water users to practically develop and manage water sources for water user rights attainment. GWP (2016) emphasized that water resources must be managed at all angles from policy-based, and institutional to behavioural aspects, by encouraging water users to manage well water, repair water technologies and solve water conflicts.

In Tanzania, the water resource is governed by the national water policy of 2002 and WRM Act No. 11 of 2009 through institutional arrangements e.g., of WUA and LGAs entitled to formalize all related water user rights including water permits, water user fees regulations, property rights in the basin level. All institutionalized water institutions are required to manage, coordinate, regulate and monitor the water supply at the basin level. A study conducted by Ostrom, (2010) indicated that the management of water in Common Pool Resources (CPR) cycles is always mismanaged; this is because of the multiple and overlapping institutions in the valley. This implies that the multiple water institutions in the valley are not performing adequately and sufficiently. Moreover, this means that most of the water institutions have similar primary roles and targets to promote water users. One study by Edastav (2010), on power struggles, indicated that in Kiru irrigation scheme, there is a complex of implementation rules and multiple institutions e.g., WUA, BWO, and Village Water Councils with almost the same objectives, roles and targets against the water user rights of the users in the valley. In this paper, the performance was undertaken by the formal e.g., WUA, BWO and water development partners (WVoT and IFAD) and informal (Local knowledge e.g., norms, behaviour) that shape water users in the valley.

Some studies (Muginya, 2013; Edastav, 2010) show that WUA seems to perform, achieve and reflect well the desired Water Resource Management Act No. 11 of 2009 primary roles than



other water institutions i.e., LGAs, WVoT and IFAD in the valley. This implies that the WUA model can manage water, not overuse and misbehave, repair water technologies and solve water problems and competition in the valley the WUA model's common challenge is inadequate human resources. However, there is little consensus about other aspects of institutional performance targets. Another study by Mosha, *et al.*, (2016) argued that good performance or lack of performance of the institutions by looking at a set of institutions is not recommended. In this study, the performance of institutional water was evaluated in Kiru valley, Tanzania. The study seeks to report findings on the institutional performance of the existing institutional arrangement managing water distribution and availability in the valley. Therefore, the study uses the primary roles of the WRM Act No. 11 of 2009 and the institutional targets of WUA, BWO, LGAs and development partners to evaluate the performing trend in the valley.

2.0 THEORIES UNDERPINNING THE STUDY

The underpinning theories of this study are Common Pool Resources (CPR) by Saunders, (2014) and New Institutionalism (NI) by (March & Olsen, 1984). The theories were reviewed to determine the performance of water institutions towards water user rights in the valley. The theories further illustrated essential determinant factors for adopting institutional arrangements by smallholder farmers in their different river basins. At the theoretical level, CPRT shows that there is poor coordination (failure) of actors (e.g., LGAs, BWO and WUA) in the water institutions due to increased conflicting goals, elite dominance, poor decision-making, complex property rights, the tragedy of the commons and weak institutional structures. While the NIT explains the importance of effective multiple actors' involvement from macro to micro levels to enhance the effective provision of water rights and use. As such, weak chains/rules among actors and their processes within the environment impinge on smallholder farmers' ability, self-decision, self-governance, control and use of water to enhance their water rights in the valley. Therefore, this study was undertaken to bridge the gap and add to the existing knowledge on institutional performance.

EMPIRICAL REVIEW

The empirical literature revealed that a majority of studies on water resources have focused on the contributions of famous basins. Pangani, Rufiji, Kilombero in agricultural livelihoods and not the impact of the performance of water institutions among smallholder farmers implications on water user rights in small and semi-arid basins, like Kiru (Said, 2008; Liheluka, 2014; Lal, 2017). Likewise, most of the literature reviewed focused on the assessment of basins'



governance on agricultural livelihood in humid and coastal areas and not in semi-arid areas. However, studies by Said (2008), Kaswamila & Malipula (2013) in Kiru Valley and Saadan and Ruaha National Parks respectively have opinions that basins' management is heavily skewed in favour of private actors, like big-scale farmers and have powers over small producers. As such, the problems of institutional performance enhancing water rights among smallholder farmers in semi-arid basins in Tanzania have not been addressed. Therefore, this paper is required to bridge the knowledge gap by investigating the performance of water institutions in Kiru valley, Tanzania.

Smallholder Farmers in Water Basins in Developing Countries

Rural smallholder farmers in developing countries are the most affected by the common persistent problems, including extreme poverty, climate variability, exclusion, ignorance, poor governing institutions and financial ability (FAO 2015; Lal, 2017). Other studies reveal that in rural Africa, there is a consensus that the strong involvement of smallholder farmers in governing water resources could boost water user rights, hence reducing poverty in the continent (World Bank, 2015). Thus, water user rights may offer the best opportunity to move the smallholder farmers out of extreme poverty and build satisfying water user rights among poor people (WWF, 2016; Christian, & Wong 2017). Furthermore, governance through participation and accountability in sustaining water rights is very low, largely because the perceptions and attitudes over water rights are characterized by drudgery, mismanagement habits and minimal financial returns (Franks *et al.*, 2013; WWF, 2016). This perception is reinforced by the labour-intensive nature of wetlands as has been revealed in the study by World Bank (2015) and FAO (2015). Liheluka (2014) contends that smallholder farmers want to practice modern water governance in water rights that use more participatory methods and technical skills but less energy to access and control water. In contrast, some studies reveal successful and innovative water governance by smallholder farmers in Africa (Franks *et al.*, 2013; WHC, 2014). Based on this understanding, there is still a need of increasing awareness of the potential of water institutions for water rights (WWF, 2016). Extensive knowledge of the utilization of natural resources as well as other options of capital is required for planning and prioritizing water user research to achieve water user rights and improve its allocation and distribution. Basin water is one of the world's most widely used commodities. In Tanzania, basin water is mostly found in Rufiji basin, Wami basin, Little Ruaha basin, Kilombero basin and parts of Lake Victoria basin (Machimu, 2016).



Water Service Performance In Tanzania

Water institutions have established water use policies and regulations to improve, regulate and finally achieve the stated functions and targets for an institution and customers. The quality of performance of the service may be evaluated using indicators such as reliability and equity or through WRM Act No. 11 of 2009 and institutional performance targets (Ostrom, 2010; Moshia, *et al.*, 2016). A water service performance is reliable when there is a very high probability that the discharge and pressure delivered to a customer correspond to those contracted between the water institution and the customer. The water service performance is not reliable when there are frequent breaks in the delivery of the service assigned, or when only a small discharge and reduced pressure are currently available to the customer. When the service is not reliable or performed effectively, the user tends to consider that the water rights are always excessive and that not enough water is made available to him or her. When frequent breaks occur, the user may be forced to create coping strategies for getting water. In most developing countries, problems occur when there is no equity in the service and performance of the institution. Over the past decade, equity occurs when all customers receive a similar service in terms of water discharge, allocation, volume, location, socio-economic class, and type of water use. When equity does not exist and this is recognized by the poorly served customers, these react negatively to the unwillingness to adhere to a water institutional arrangement. However, equity is a principal performing service instrument when an institutional-customer relationship exists, participatory information becomes available that allows recognition of the quality of service performed in terms of reliability and critical concerns of equity of service. Developing conflict resolution mechanism also remains critical for solving problems that affect users' and institutions' performance that have positive impacts on water governance. Therefore, this paper aims to fill the critical institutional and policy gaps. Even though institutional performance is a newly developed concept, it has gained a lot of recognition in the water development policy agenda. This is because the increased water conflict requires appropriate mechanisms to reduce institutional-associated risks. Institutional performance is likely essential for implementing policies, strategies, plans, and programs under water institutional conflict-associated risks. Institutional arrangements enable the appropriate approach, planning, and practices that ensure water user rights among the stakeholders.



RESEARCH METHODOLOGY

The study was conducted at Kiru Valley, in four villages Kiru Six, Mawemairo, Matufa and Magugu-Mapea in Babati Rural District, Tanzania. Kiru Valley is one of the nine administrative basins under the Ministry of Water in Tanzania and it is an inland drainage basin that is found in a semi-arid environment. It has an area of 143,099 km², mostly mountainous with steep hills, ridges, valleys and escarpments located about 10 km from Babati, the Manyara Regional Headquarters (Babati District, 2018). The basin villages were selected as being among the potential areas for irrigated rice production. It was assumed that the selected valley would provide the best site for understanding institutional water performance at the basin level. The valley lies in an area with an average rainfall of 200 to 500 mm per annum and is severely affected by extreme climate and weather events (Said, 2008; Edestav, 2010; Christian & Wong, 2017). In addition, smallholder farmers in the villages have a chance of being exposed to and developed by many formal and informal water institutions, i.e., WUAs, BWBs and local norms, codes of conduct, and social restrictions (WVoT, 2018).

Research Design, Sampling Procedure And Sample Size

A cross-sectional research design which allows the collection of data in multiple cases at once was adopted in this study. The study sample was obtained through multiple sampling techniques and stages. The first stage was purposively selecting one basin among nine (9) national basins based on the presence of water institutions. The second stage involved a purposive selection of two wards from the district making a total of two valley wards. The third stage involved the selection of two villages from each ward. Two villages per ward were thus selected. The two villages selected per ward were based on the fact that they were located on the river basin for easy accessibility and similarities in water-related conditions; one was located on the upper stream and the other is located on the lower stream. The last stage involved the selection of 70 household heads from the sampling frame of the basin villages. The sampling unit was a household which is engaged in institutional water performance. The sample size for saturation was determined based on the information required in the study (Bryman, 2004). In the context of this study, it used 30/35 interviews and 4 Focus Group Discussions (FGDs) (10 in each village).

Data Collection And Analysis

In this study, various data collection methods were used e.g., Focus Group Discussion (FGDs), a questionnaire, checklist interview guides and physical visits. A questionnaire involved a researcher collecting data from 45 smallholder farmers and 30 key informants using semi-



structured questions. Where the head was not available for the interviewing, spouses were interviewed. The interview questionnaire and checklists captured respondents' information and opinions on the performance of institutional water using Likert scale statements constructed based on the primary roles of the WRM Act No. 11 of 2009 and institutional water targets. Respondent's responses related to institutional performance were assigned related with very high, high, moderate, low and very low and some follow-up-related questions were asked to respondents. This study also involved one FGD in each village having 10 water stakeholders (7 e.g., 4/3 men/women water users, 2 water user groups, 1 village leader). During FGDs, water performance-related issues with WRM Act No. 11 of 2009 and institutional targets (e.g., WUA, LGAs, WVoT and IFAD) in terms of water management, repairing technologies, and conflict resolution was well discussed. FGD's responses were recorded using notebooks and analyzed/coded using content analysis to get the final themes. Five likert scales were merged into high and low statements to get the final merged themes. Quantitative data were analyzed using Statistical Package for Social Sciences (version 21).

RESULTS AND DISCUSSION

The performance degree to which water management institutions are effective and appropriate in achieving water user rights was assessed using water users' perceptions (very high (5), high (4), moderate (3), low (2) and very low (1)) against the four key institutional water targets to achieve water roles based on WRM Act No. 11 of 2009, that is, water managing and conserving strategies, water use technologies, collection of water user fees, water conflict resolution and awareness. These targets if used can result in wise water use for the general agricultural, social, environmental and economic benefits (WRM Act, No. 11 of 2009). The main water institutions assessed were WUA, LGAs, NGOs, BWO and informal water practices e.g., norms and attitudes. According to the key informant's general overviews from WUAs, LGAs, BWO and NGOs (e.g., WVoT and IFAD) observed that all water institutions reflected the primary water targets of the WRM Act No. 11 of 2009 and explained under institutional targets in different degrees in the study area (see Table 1). Thus, improving water management and propagating the performance of water institutions is of utmost importance in current times. The primary roles of water institutions as promised by the WRM Act No. 11 of 2009 under institutional targets are also relevant to the vision and mission of Tanzania Development Vision of 2025 (TDV 2025) and Sustainable Development Goals of 2030 (SDGs 2030) of interest for its stakeholders.



Table 1: The Overall performance institutional targets

No	Water Institution	Institutional Water Targets/Indicators	Performance Capacity
1	WUAs	1. Water management 2. Water scheduling and Allocating 3., Water repairing technologies and 4. Solve Water conflict	Very High in Kiru Six, Mawemairo and Matufa villages
2	LGAs VWCs	e.g., 1. Managing water at the village level, 2.Scheduling and fairly allocating water, 3. Educating water users to pay water user fees 4. Solve Water conflict	High in Kiru Six, Mawemairo and Matufa villages and very low in Magugu-Mapea
3	BWO	1. Provision of water permits 2. Execution of water laws and bylaws, 3. Collect user fees and S4.Solve water conflict	Moderate in Kiru Six, Mawemairo and Matufa villages and very low in Magugu-Mapea
4	NGOs WVoT & IFAD	e.g., 1. Improve water resources at all levels 2. Develop capacity building 3. Repair & Construct new irrigation 4. Ensure water integrity & productivity	Moderate in Kiru Six, Mawemairo, Matufa and very low in Magugu-Mapea villages
5	Informal communal elders	e.g., 1. Preserve water, 2. Control Water pollution, 3. Maintaining water use taboos and 4. Solve water conflict	Very Low in Kiru Six, Mawemairo, Matufa and very high in Magugu-Mapea villages

Note: **WUA** = Water User Association; **LGAs** = Local Government Authorities; **VWC** = Village Water Councils; **BWO** = Basin Water Office; **NGOs** = Non-Government Organizations; **WVoT** = World Vision of Tanzania; and **IFAD** = International Fund and Agricultural Development.

Source: Field Data (2020)

According to the likert scale responses of the key informants (water use stakeholders) and during FGDs, analyzed the performance trends, observed that WUA was ranked the very highest and outstanding performing institution in achieving its water use targets (See Table 1) and reflects outstandingly with the WRM Act No. 11 of 2009, for example, the Mawemairo-Matufa



hydrological boundary conflicts between users/stakeholders were solved by WUA committee that has been calling upon the conflict resolution forum for any aroused water conflict, and for a large extent, the water solving conflict exercise has been successfully in the valley. During the in-depth interviews with the smallholder farmers and the key informants of WUA in Kiru Six village observed that WUA since it was introduced in the valley has managed well water use among water users including smallholder farmers who have managed well the valley through solving serious water problems, especially during dry seasons, for example during documentary review in years 2015/16 a serious trans-hydrological boundary conflict between Kiru Six-Mawemairo village was well solved through WUA model by putting clear a water demarcation points (e.g., not to cross a water boundary agreed) that were agreed by all conflicting parties. Furthermore, the studies by Said (2008); Edastav, (2010) observed the changing water use and its management by bringing up a general platform where users, community organizations, government agencies and stakeholders develop a coordination and negotiation mechanism in Kiru Valley. The LGAs e.g., Village Water councils have also ranked as the second highest performing water institution its set targets exceeded expectations, for example, the targets achieved by the VWCs are managing water at the village level, 2. Scheduling and fairly allocating water, 4. Educating water users to pay water user fees e.g., smallholder farmers in Kiru Six village are willingly paying the user fees to the collecting BWO; and 4. Solve Water conflict all these targets have been well achieved and understood among the water users/stakeholders in the valley. This study is contrary to the study by Avenant and April (2016) who observed that in the water basin there are some set targets are not achieved due to multiple water institutions. This implies that in the valley it seems that the second and the third targets are in line with Singida BWO since these two targets have to do with water rights. One of the key informants in the valley said;

“Water use authorities, for example, WUA and LGAs (VWCs) have all together empowered us on water user fees and today at some point we are very willing and positive towards paying water user fees for the services we are getting than before 20 years ago in the valley” (Key Informant, 24th October, 2020-Kiru Six Village).

During FGDs in Kiru Six, Mawemairo and Matufa villages observed that the BWO frustrate water users of its overlapped roles and bylaws, for example, BWO in the said villages, gives quickly water permits to large farmers than smallholder farmers at the same time solves water problems, for this case the BWO has performed its targets moderately for not reflecting well with the WRM Act of 2009 No. 11 and its institutional targets in Kiru valley (for example BWO



is solving water user fees complaints when it is far from Singida, the water use stakeholders are not well satisfied with the BWO service to them, it is not visiting the valley frequently). During FGDs and in-depth interviews in Matufa and Magugu-Mapea observed that water development agencies e.g., WVoT has a minimal and low-performance profile in Kiru valley, most of its targets are confused, overlapped (for example, in the valley there are different BWO and WUA governing rules mostly are not clear and seen as not appropriate by the majority of stakeholders) with the WUA model, financial aids delays, Magugu-Mapea isolated etc. therefore, WVoT was not well appreciated to comply with the WRM Act No. 11 of 2009. One of the key informants during the discussion said:

“It is better for one water institution to deal with its institutional targets. For example, WVoT was introduced in the valley as one of the development water partners e.g., targeted to construct or repair water systems in basin villages, unfortunately, WVoT does not perform well with its water use targets in the valley due to elite capture who want to introduce their water use targets deviating from the WVoT” (Key Informant, 16th October 2020- Magugu-Mapea Village).

Furthermore, the informal institutions e.g., communal elders and other water management taboos were used side-to-side with the formal water institution in water management for example water sources in Kiru Six village have been protected by informal norms e.g., at the water sources/intakes all people are prohibited to water pollution by not taking bath, since the prohibition gives longer preservation of water in the valley. Moreover in Magugu-Mapea village, a formal institutional arrangement has not been made in water use and management, therefore, the smallholder farmers to the most extent have lied on local knowledge such as using community leaders to solve water problems among stakeholders. During the Key informant’s general opinions from the study villages of Mawemairo and Matufa observed that the informal institutions nowadays are outdated due to the massive growth of formal waterways that to large extent discourage the use of local knowledge in the valley e.g., using local digging canals/wells or boreholes in water management has not been health for sustainable water management, since the local knowledge (LK) has a very low-performance influence by not reflecting well the WRM Act No. 11 of 2009 and institutional targets in water use and management, for example in Magugu-Mapea, it has been observed that the use of termites and *ficus/mikuyu* trees as predicting water availability indicator has misled the smallholders, especially during the dry seasons in Kiru valley. Also, the provisional rules and local conditions and fair representation in water decision-making bodies seemed to perform better and achieved in the informal irrigation schemes Since



Kiru valley involves a lot of stakeholders including multiple water institutions and local communities from many sectors, it makes water in valley hard to manage formally and sustainably. But to establish too many new platforms and institutions may be difficult and not so effective for example WUA and VWC roles in both Mawemairo and Matufa do collide in decision-making, therefore, the general opinion of the respondents was that an effective WUA should be empowered for sustainable water use in Kiru valley. This is to say, the formalization of any institutional water arrangement by policy makers should build on the existing informally established regulations and take into account local conditions to expand inter-linkage networks. WRM Act of 2009 No. 11's primary roles discourse laid the foundation for developing a water institutional arrangement to identify various layers of institutional water use inter-linkages and institution-performance linkages. Thus, the performance role of water institutions aims to highlight the achievement status of water institutions in Kiru valley and discuss, in detail, different performing aspects of it. Given the above aspects are discussed under the following sub-theme of performance.

Collective Institutional Performance Arrangements

FGD's opinions observed that smallholder farmers adhered to participate in collective action arrangements in facilitating water allocation and distribution (water rights) and the scheme type was positive. Furthermore, the informal collective water decisions worked more smoothly in Magugu-Mapea than in formal arrangements in Kiru Six village, this implies that in the first systems the water users are positively agreeing with the local knowledge instructed since they have no full formal intervention either by the WUA model or other water institutions, while the latter seems to be very formal and official accompanied by many institutional decisions that fail to have the spirit of collectivism in the valley. For example in Matufa village, many water systems deteriorating because of lacking accountability and collective decisions, and water users say when they pay water user fees, they have no to do with the water arrangement in the valley. This design principle has practical implications in communal works e.g., in Magugu-Mapea such as participation in the cleaning of the irrigation systems that facilitate water distribution in farmers' fields. According to the WRM Act of 2009 No. 11, the objectives also look at how the people affected by the operational rules can participate in modifying the same. Because of this study's finding, smallholder farmers in informal schemes develop a wide range of rules to specify rights and responsibilities among themselves e.g. water for all and everyone has to be a water pollution watcher.



They, therefore, cooperate more in collective works than those in formal schemes. This may be explained by Mosha, *et al.*, (2016); Plan Vivo-Foundation Carbon Tanzania (2016); Khandker, (2010) that since the impact of irrigation systems was poor in informal schemes; smallholder farmers had many chances to meet, and interacted more hence the better able to participate in modifying operational rules. A study based on game theories and experimental design argues that groups that interact repeatedly have higher cooperation rates (NRC, 2002); Malesevic (2010); Foster, *et al.*, (2016). NRC's argument is shared by other researchers such as Nguyen and Ross, (2017) who argue that in purely irrigation farming in Vietnam users are involved from the very beginning and so they are bonded through collective efforts. Furthermore, similar observations by Muginya (2013); Dublin Principles (1992) suggested three types of institutions affecting distributive fairness including: (1) the property rights that define the basic norms of fairness (2) the extent of interaction between the players in the game (anonymity and identification) which determines how far these norms are activated and (3) player's opportunity to set which affects the extent to which the players can actively influence the game outcome. This implies to the study that improved and created water use rights, WUA and water users i.e. smallholder-farmers (interaction of players) and water user's forum and voice (player's opportunity) all if are linked up can enhance an opportunity of the whole squad is winning to get water user rights in the basin. According to Mawemairo VEO noted that the institutional performance in Kiru valley has been affected by the following challenges climate change, land lease policy, overlapped decisions, power struggle and limited land. This study argument is in line with the study by Victor (2012) in Central Tanzania, Dodoma and Singida regions who found that the water projects could not be able to serve additional water demands because of the highly growing challenges such as population.

CONCLUSION AND RECOMMENDATIONS

In the context of this paper, the study attempted to assess the existing institutional performance enhancing water user rights among smallholders-farmers in the basin. Institutional arrangement in the valley is very rich in formal (e.g., WUA, LGAs, WVoT and IFAD) than informal rules (local knowledge e.g., norms, culture, behaviour), all these needed to be well integrated in terms of working together and effectively to improve water user rights e.g., water allocation and distribution. They showed to have involved the smallholder farmers in the valley to come up with an effective water institutional performance framework. This study, therefore recommends that policy and decision makers including the government should create a good performing environment for both formal and informal water institutions to recognize the integration of



working together for the promotion of the smallholder farmers in the valley in water resource management.

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