Tanzania Journal of Development Studies, Vol. 17, No. 2, 2019:44-55

Water-Use Permits and Water Accessibility for Livestock in Tanzania

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Abstract

The system of water-use permits in the Ruaha sub-basin, Tanzania, has failed to guarantee smooth accessibility of water to pastoralists. Due to the allocation of water-use permits for irrigation agriculture without considering the interests of the pastoralists, re-allocation of designated livestock watering points for other uses, and the lack of formal documents for protecting livestock watering points have rendered pastoralists to being non-entitled to water. Although there are some possible 'windows' of cooperation between holders of collective water-use permits and pastoralists, however there are more challenges that makes those windows to be ineffective.

Keywords: *water-use permit, water resources, pastoralists, Ruaha sub-basin, Tanzania*

1. Introduction

The Ruaha sub-basin was traditionally a grazing and cultivation area. The indigenous communities such as the Wasangu used to keep herds of livestock and cultivate in the lower side valleys. It is not surprising to note that all the ethnic groups in the area had some levels of customary arrangements for accessing and allocating water for their livelihoods, and for conserving water resources (Maganga, 2003; Sokile, et al., 2003). However, due to increasing of population and numerous economic undertakings, there have emerged complex and diverse groups of water-users, a situation that has led to acute competition over available water resources. The area is now having more than five major competing forms of water-use: domestic use, irrigation agriculture, livestock watering, Ruaha National Park, and the generation of hydroelectric power in Mtera and Kidatu (Magayane, 2005). As one of the measures of regulating the competing water-use and to ensure sustainability of water resources, the government has introduced and strengthened the use of formal water-use permits (URT, 2009). Formal water-use permits are written certificates that state the purpose(s) for which water is sought, source from which it is to be drawn, proposed point of diversion, volume to be diverted, nature of existing and proposed hydraulic structures, and drainage and treatment (Caponera, 1992). Permit systems are now being promoted as the single most effective legal device to address water management problems of the twenty-first century (van Koppen, 2007).

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It is in this perspective that Tanzania enacted the Water Resources Management Act No. 11 of 2009 that requires any person who diverts, dams, stores, abstracts or uses water from surface or underground water sources be obliged to apply for a water-use permit from relevant water managers/authorities (URT, 2009). Currently, while all water-users are encouraged—and indeed required—to apply for water-use permits to legalize their water-uses in the Ruaha sub-basin, pastoralists seem to be an exceptional group as far as water-use permits are concerned. In the three sub-catchments involved in this study, there was no single water-use permit registered for livestock keepers even though livestock are among the major users of water in the Ruaha sub-basin.

According to the basin authorities, livestock were treated in a similar manner as wild animals that are free to access water directly from the river or any other natural sources without a special (formal) permit, provided that no abstraction structure on the source of water is made. Nevertheless, the applicability and implications of such a perspective is very significant not only on water accessibility, control, and its management; but also on relations with other users who hold formal water-use permits. Using information from a case study of three sub-catchments of the Ruaha sub-basin, this article attempts to expose the implication of the lack of formal water-use permits on water accessibility, control, and use by pastoralists in the Ruaha sub-basin, Tanzania.

2. Methodology

The information in this article was obtained from a study conducted in three sub-catchments of the Ruaha sub-basin, which constitutes the upper part of the Rufiji Basin; the biggest hydrological basin in Tanzania. The three sub-catchments were Kimani sub-catchment (Mbarali district, Mbeya region), Tungamalenga sub-catchment (Iringa district, Iringa region), and Lukosi sub-catchment (Kilolo district, Iringa region). Six villages were involved in this study; two from each sub-catchment. The villages were Mbuyuni and Itamba in the Kimani sub-catchment; Tungamalenga and Makifu in the Tungamalenga sub-catchment; and Ruaha Mbuyuni and Mtandika in the Lukosi sub-catchment.

The study employed two types of sampling techniques: random and purposive sampling. The nature of water-use in the study areas was a general criterion that guided the selection of the sample population. Random sampling was used in selecting household respondents, while purposive sampling was used to obtain the key informants from each village and the relevant basin water officials.

While secondary data were collected through library research, primary data on the other hand were collected using household questionnaires, followed by in-depth interviews and focus group discussions. To complement the 361 questionnaires that were administered to community members (at household level), 51 in-depth interviews and 12 focused group discussions (FGDs) were also administered; all in an endeavour to seek more nuanced information.

3. Livestock Keeping and Sources of Water in the Three Sub-Catchments

In the Ruaha sub-basin, the upper sub-catchments consisting of Mbuyuni and Itamba villages were the ones that were found to have many respondents who are livestock keepers; with 50(45.9%) and 42(44.7%) of all the total respondents, respectively. The lower sub-catchment comprising of Ruaha Mbuyuni and Mtandika villages came second in terms of the numbers of livestock keepers at 22(45.8%) and 10(17.9%), respectively. The middle sub-catchment—that is the villages of Tungamalenga and Makifu—had very few respondents involved in livestock keeping. The Tungamalenga village had 11(28.9%), and the Makifu village had 1(6.3%) respondents involved in livestock keeping. Table 1 shows the respondents' participation in livestock keeping by the villages.

Table 1: Respondents' Participation in Livestock Keeping by Villages

	Practice in Livestock Keeping			
Name of Village	***Yes***	***No***	***Missing***	**Total**
Ruaha Mbuyuni	22(45.8%)	26(54.2%)	0(0%)	48
Mtandika	10(17.9%)	46(82.1%)	0(0%)	56
Tungamalenga	11(28.9%)	27(71.1%)	0(0%)	38
Makifu	1(6.3%)	15(93.7)	0(0%)	16
Mbuyuni	50(45.9%)	58(53.2%)	1(0.9%)	109
Itamba	42(44.7%)	49(52.1%)	3(3.2%)	94
Total	**136(37.7%)**	**221(61.2%)**	**4(1.1%)**	**361**

Source: Field Survey (2016).

In the case of Mbuyuni and Itamba villages, River Kimani was the main source of water for livestock use; while for Tungamalenga and Makifu villages the water source was the Tungamalenga River. The Lukosi River was the water source for livestock use for Ruaha Mbuyuni and Mtandika villages. While respondents from Ruaha Mbuyuni, Mtandika, Tungamalenga and Makifu villages depended on the said rivers as the only sources of water during the rain and dry seasons, the situation for Mbuyuni and Itamba villages was a bit different. Although almost all respondents involved in livestock keeping fully depended on river Kimani as a source of water for their livestock during the dry season in these two villages, they however depended on seasonal ponds or wells for watering their animals during the rainy season.

4. Water-use Permits and Water Accessibility for Livestock in Ruaha Sub-Basin

In the three sub-catchments understudy, two types of water-use permits were operational: domestic water-use permits, and irrigation agriculture water-use permits. Nevertheless, the water-use permits were further divided into two categories: privately-owned irrigation water-use permits, and collectively-owned irrigation water-use permits. Across the villages, the distributions of water permits were as follows. In Ruaha Mbuyuni village there was one irrigation agriculture water-use permit collectively-owned by 246 members, and 90 privately-owned water permits. In Mtandika village there was one irrigation agriculture water-use permit collectively owned by 590 members, and 60 private registered permits. However, a different

scenario concerning water-use permits was noted in Tungamalenga and Makifu villages. In these two villages, there was only one irrigation agriculture water-use permit per village that was collectively owned by 210 and 208 members, respectively. There was no private water permit in these two villages. Similarly, the situation was the same for Mbuyuni and Itamba villages where each village had one irrigation agriculture water-use permit collectively owned by 1105 and 244 members, respectively. Again, for these two villages, just like in the previous case, there was no registered private-owned water-use permit. Intriguingly, in all six villages there was no single permit—whether private or collective—that was registered specifically for livestock water-use. A major question then arises: how do pastoralists get access to water for their livestock?

Here, there were two options. In the first, there are windows for cooperation between collective owners of water-use permits and pastoralists, although this is not easy and straightforward. The second option is accessing water-use by any means, which would loosely translate into obtaining water for livestock through conflicts with other users of water. The following sub-section provides detailed explanations on how the two options are employed by pastoralists to access water for their livestock in the Ruaha sub-basin in Tanzania.

4.1 Collective Water-use Permits and Windows of Cooperation

In the Ruaha sub-basin, particularly in the three sub-catchments studied, there were three possibilities of cooperation between collective owners of water-use permits (farmers) and livestock keepers. To some extent such possibilities would provide opportunities for livestock keepers to access water without violence. Nevertheless, the applicability of such windows of cooperation faces several challenges.

The first window of cooperation was that pastoralists are allowed to let their livestock enter irrigation scheme areas after harvest. Although the constitutions of all Water-User Associations (WUAs) strictly prohibited livestock to enter irrigation scheme area during both the rain and dry season, nevertheless, there were some WUAs, particularly those with traditional irrigation schemes, that let pastoralists enter irrigation scheme areas for water and pastures, especially after crop harvest. This kind of arrangement was found in the Kimani sub-catchment and Isenyela WUAs. Livestock were allowed to enter irrigation scheme areas from the end of July up to the end of October. This kind of arrangement was possible only if the pastoralists adhered to some conditionality's. First, they were obliged to ensure that their livestock pass through available bridges when crossing main irrigation canals to avoid destroying the main canals. Furthermore, they were obliged to ensure that all important irrigation infrastructures, such as water off-take and water distribution points, were not in any case destroyed by livestock. It was noted in this study that such a possibility was only viable in the traditional irrigation schemes, in which owners of livestock needed to be members of WUAs, i.e., they should also be practicing irrigation farming. The quotations below present a summary of the applicability of the system and its challenges:

> *"We pastoralists have a good relationship with the Isenyela Water-user Association. During the dry season, i.e., from the end of July to November, we are allowed to let our livestock into the irrigation scheme so that we may get water and pastures. A big problem here is pastoralists from outside this ward who normally do not know the conditions and procedures of letting the livestock enter the irrigation schemes. These outsiders (intruders) are sometimes invited by the leaders of village governments without consultation with the farmers"* (An interview with a leader of a pastoralist group, Mapogoro ward).

Another pastoralist from Itamba village added to this thus:

> *"To some of the irrigation schemes, we are allowed to let our livestock enter the schemes during the dry season. We have agreed on specific months of letting animals into the schemes and specific date of getting animals out of the irrigation scheme. We are also farmers; therefore, we normally participate in the development of canals (water-works). The problem here is pastoralists from outside this ward; sometimes they are invited by leaders of the village government and they bribe leaders in the village government so that they can let their animals enter the irrigation schemes. These intruders do not know the agreement between us and farmers on the procedures of letting the livestock into the irrigation schemes"* (An interview with an elder pastoralist, Itamba village).

The second window of cooperation between WUAs and pastoralist was through the allocation of special areas for watering livestock. Such an arrangement was found in Mtandika and Tungamalenga villages whereby the village governments, in cooperation with WUAs and groups of pastoralists, allocated areas for watering livestock. In Mtandika village, for example, four areas on the Lukosi River were allocated for watering animals. In the Tungamalenga village, the village government formed a special committee—constituted by both pastoralists and farmers—that reached an agreement that the lower part of the Tungamalenga irrigation scheme, at least 100 metres on both side of the Tungamalenga River, should be free from any farming activities; instead it was specially reserved for watering livestock.

The big challenge that faced this arrangement was the lack of formal documents, such as minutes of the village meetings that legitimised such arrangements. This denied the pastoralists the right of claiming back their livestock's watering points in courts of law once their areas were re-allocated to other different activities. This challenge was accentuated by some village government leaders' perspective that pastoralists must be flexible and be able to conform to any changes related to the allocation and re-allocation of water abstraction points for irrigation agriculture and/or for watering livestock. The quotation below confirms such a perspective as remarked by one of the village leaders who was a key informant from Ruaha Mbuyuni village.

> *"For example, pastoralists are demanding to use that site where farmers have constructed their off-take. The off-take cost more than TZS400 million. Their argument is very simple: that because they were using that area during the past, they need to continue to use the place up to the moment. They do not want to be told that they should move to another place. It is obvious that as the village expands, pastoralists have to go to the outskirts of the village"* (An interview with a key informant from Ruaha Mbuyuni village government).

Another area of cooperation between owners of water-use permits (members of WUAs) and pastoralists was on paths that should be used by livestock when going for water. WUAs and livestock keepers usually agreed on the specially created paths through which livestock should pass to reach the river. This arrangement was established especially at the upper stream of the Kaman sub-catchment in Mbuyuni village. In this village, the Kaman River, which was also a major source of water for livestock especially during the dry season, was surrounded by farmers on both sides, who owned water-use permits through WUAs to the extent that there was no well-established path for the livestock to pass through to reach the river. In this area, to avoid conflicts with farmers, during the dry season pastoralists used to meet with leaders of WUAs to request for a path through which their livestock should pass to access water from the river. Although this arrangement was possible, it was however temporary as the path was just for seasonal use and therefore unreliable. Explaining about the applicability and the challenges of such an agreement between farmers and livestock keepers on the special paths for livestock movements, one of the key informants of livestock keepers from Mbuyuni village remarked as follows:

> *"To avoid conflicts with farmers, we always, especially during the dry seasons, meet with leaders of farmers and ask them to show us areas that we can use to pass through with our animals towards the river. They normally show us the areas, however, only for seasonal use. The problem with the farmers is that they do not show us a permanent path. Therefore, we have that challenge of repeating the same exercise of requesting a path from farmers year after year, a situation that makes us look like slaves to the farmers. You should bear in mind that the exercise of showing livestock path involves some costs such as transport and allowances. All these costs must be paid by us pastoralists. For example, last year during the exercise we incurred the cost of transporting leaders, both farmers and pastoralists. We used four motorcycles, and paid TZS15,000 for each. Also, we provided meal allowances to the leaders of farmers. With all these costs, however, we used the path just for one season, i.e., from June to October. Thereafter, the path was closed. Therefore, we are sure that the same situation will also happen this year; and we must do the same thing otherwise conflicts will erupt as pastoralists will most likely forcefully herd their livestock through the irrigation schemes"* (Key Informant, Livestock Keepers, Mbuyuni Village).

4.2 Water-use Permits and the Closed Windows of Cooperation

In the Ruaha sub-basin, a relatively big number of farmers had formal (paper-based) water-use permits that were privately or collectively owned through WUAs. Pastoralists who, according to a key informant from the Rufiji Basin Water Office (RBWO), did not need water permits for watering their livestock directly from the river were major victims of increased number of water-use permits among farmers. The granting of water-use permits, especially private permits, did not take into consideration the nature of land use around water abstraction points. Due to this, some water-use permits were granted either for areas that used to be livestock watering points or livestock's paths toward watering points. This was a major source of conflicts between owners (private) of water-use permits and pastoralists. In Ruaha Mbuyuni village, for example, where there were many private permits, almost all areas that were formerly used as livestock watering points were turned into water abstraction points for irrigation agriculture. Expressing the insight of the

conflict over the re-allocation of the Kwale livestock watering point located along the Lukosi River in Ruaha Mbuyuni village, as Photo 1 illustrates, one of the key informants from the pastoralists made the following remark:

> *"Our big conflicts with farmers are on watering points for livestock. Let me start with Kwale watering point. This is the animals' watering point where there are already structures for animal watering (built with concretes to avoid soil erosion and destruction of the river banks). We have used this area for more than 20 years. However, recently a person from town came here and bought the area, and put water pump for abstracting water for irrigation agriculture; and decided to close the livestock path. Therefore, we are going there just by force. The second point for watering livestock is Kigamboni. Also, we have used the area for more than 20 years. Again, one rich man from town came here and bought the area. As we are speaking, Kigamboni is no longer a watering point for livestock. There is a water pump for abstracting water for irrigation agriculture. Due to this, pastoralists are obliged to confront farmers for the watering rights."* (Pastoralist Key Informant, Ruaha Mbuyuni Village).

Photo 1: A livestock watering point that is no longer in use
Source: Author's field work (2016)

Similar conflicts were found at the upper sub-catchments of the Ruaha Sub-Basin, in the Kimani sub-catchment, especially in areas with modern irrigation schemes. Unlike in the lower sub-catchments—i.e., the Lukosi sub-catchment—where conflicts were between private owners of water-use permits and pastoralists mainly caused by the re-allocation of livestock watering points to water abstraction points, most of the conflicts in the Kimani sub-catchment were between WUAs and pastoralists. Here, conflicts were over the creation and provision of livestock's paths toward the Kimani River. This conflict in the Kimani sub-catchment was accentuated by the expansion of WUAs' owned irrigation schemes that had formal water-use permits, making it almost impossible for livestock to reach the Kimani River for watering. During the rainy season, there were no conflicts as pastoralists depended on seasonal ponds in up-land areas for watering livestock. However, the situation was extremely tense during the dry season when seasonal ponds dried up leaving the pastoralists with no alternative for livestock water. As such, pastoralists

would be forced to take their livestock to the Kimani River by crossing irrigation schemes, which flared up conflicts with farmers. According to the WUAs' by-laws, livestock are strictly prohibited in irrigation schemes during both the rainy and dry seasons. Sometimes, conflicts would become violent; involving physical fights; injuring and sometimes killing livestock; and in extreme cases injuring people. Explaining these incidences, one of the leaders of MAMREMA, a Water-user Association from Mbuyuni village, remarked as follows:

> *"Normally, in this area, there are many conflicts during the dry season because pastoralists send their livestock down there to the river. Every year there must be incidences of injuries due to conflicts between farmers and pastoralists. Last year (2015), for example, the chairman of Uturo Water-user Association got a physical disability because he was beaten by pastoralists as he was stopping them from letting their livestock into the irrigation scheme"* (A MAMREMA Leader, Mbuyuni village).

The above scenario was supported by one of the leaders of a pastoralist group from Itamba village. The following quotation provides an insight into the matter:

> *"Last year, a serious conflict erupted between pastoralists and farmers as livestock entered the Uturo irrigation scheme. Farmers decided to take the law into their own hands. Using machetes, they attacked the livestock and killed four cattle. These types of conflicts are very common during the dry season, especially in September and October of every year"* (A Leader of a Pastoralist Group, Itamba Village).

5. Discussion of the Findings

Water is the most precious resource that all societies depend upon (Wolf et al., 2005; Petersen-Perlman et al., 2017). Given its centrality to human life and the ecosystem, managing water is a complicated task because there are always competing demands that threaten opportunities of finding consensus among water-users (USAID, 2014; Petersen-Perlman et al., 2017). When competing interests over water resources clash, water conflicts are likely to occur (Cooley & Gleick, 2011). However, scholars and practitioners of water resources agree that effective and integrated water governance is required for water to perform its precious role for the wellbeing of human beings and ecosystems (Sadoff & Grey, 2002). Effective water governance, among others, means cooperative management that requires the engagement of stakeholders (including local communities) to work together and share knowledge, power, and responsibilities (Rogers & Hall, 2003; Cooley & Gleick, 2011; Petersen-Perlman, 2017).

Cooperative water management requires building strong institutional capacity. As noted by Wolf et al. (2003) and Yoffe et al. (2003; 2004), building institutional capacity through formal agreements and creating river basin organization, for example, can reduce the likelihood of water conflicts as these can stabilize relations between water-users sharing a water source as they give them a certain level of certainty and predictability (McCaffrey, 2003).

The study findings revealed three windows of cooperation between pastoralists and farmers (owners of water-use permits) that could be convenient and benefit all stakeholders: (i) allow pastoralists enter irrigation schemes after harvest; (ii) allocate special areas for watering livestock; and (iii) negotiate livestock's path to access water. Although to a large extent the windows look to be viable for enhancing cooperative water management—i.e., cooperation between pastoralists and farmers—it has been difficult to implement and/or enforce such agreements. This might be due to the agreements being made in an environment where there are no strong institutional base to regulate water related interactions between different groups of water-users, particularly between the owners of water-use permits (farmers) and the non-owners of water-use permits (pastoralists). As suggested by Petersen-Perlman et al. (2017), for water agreements to be considered substantive they need to have characteristics that are operative in preventing conflicts.

Normally different water legislations provide a range of exemptions for what is perceived as non-economic water usage that would otherwise require formal water-use permit (Hodgson, 2006). Such exemptions might depend on the type of water-use and the volume of water used, and may vary from one place to another. In most countries exempted usage of water are commonly classified as 'common uses', and include the use of water for drinking, bathing, and other domestic purposes, as well as livestock watering in case such usage does not involve the construction of water abstraction infrastructure (Veldwischet al., 2013; Hodgson, 2006). Once it is declared as a common use, then it does not require a permit. However, this also requires negotiations and common understanding among different groups of water-users. From the perspective of 'right to water', once agreed, common use must be officially protected by legislations (water Acts), otherwise, right to water to an exempted water-users can easily be compromised because they may have little legal grounds and/or resources to hold permit-holders accountable if they infringe on exempted water-users rights (Water Governance Facility, 2012; Van Koppen & Schreiner, 2014). Generally, this study found out that conflicts between farmers (holders of water-use permits) and pastoralists over livestock's watering points were compounded by the lack of the involvement of pastoralists in decisions related to the allocation of water abstraction points for irrigation agriculture, even if such decisions had direct impact on them. In the Ruaha sub-basin it is very common for livestock watering points to be re-allocated for other uses, especially to those related to formal ownership of water-use permits for the purposes of the construction of modern water off-takes for irrigation, and/or irrigation water abstraction points that uses water pumps.

Furthermore, this study established that there are no formal documents that are made to legalise decisions by village governments regarding the allocation of watering point for livestock based on the argument that pastoralists had to be flexible and accept any changes relating to the allocation and re-allocation of water abstraction point for irrigation agriculture. The lack of permanent watering points for pastoralists was a major source of conflicts between farmers (owners of formal

water-use permits) and pastoralists. Also, pastoralists associated the lack of formal water-use permits with the tendencies of village governments unilaterally allocating areas for watering livestock temporarily and then re-allocating the same areas for other activities. Furthermore, pastoralists maintain that their lack of access to water-use permits, coupled with the lack of formal documents (such as minutes) from village governments that allocated livestock's watering points, denied them the right of claiming back their livestock's watering points in courts of law once they are aggrieved. This was also noted by Van Koppen and Schreiner (2014): that the administrative system of water permits is a source of injustice as it discriminates exempted water-users by relegating them to second-class entitlement to water-use.

6. Conclusion and Recommendations

The system of formal water permits (water licence) as administered in the Ruaha sub-basin in Tanzania has failed to guarantee unhindered accessibility to water-use by exempted water-users, particularly pastoralists. Accessibility to water for livestock is dictated by holders of water permits (farmers). Thus, the system of water permits has created more tensions and conflicts between pastoralists (exempted holders of water permits) and farmers (holders of water permits). Although to some extent there some windows of mutual cooperation between holders of collective water permits and those exempted from water permits, there are no strong institutional bases to support such cooperative initiatives. There are still many challenges that affect mutual understanding on water-use among the different groups.

Thus, to achieve the intended goals of introducing formal water-use permits in the basin, this study recommends the following. First, the responsible ministry for livestock, in collaboration with the one responsible for water, together with relevant local and international NGOs, should assist pastoralists to initiate a kind of a pastoralists' water-user association. Through such an association, pastoralists can attract financial and technical support from the government, donors, and other development agencies, which might help them construct permanent livestock watering points either directly on rivers, or construct special reservoirs and acquire collective water-use permits. Secondly, through the two ministries, the government and the other water stakeholders should increasingly educate local communities on the importance of collectively-owned water-use permits for multiple water-uses. This will serve two purposes: (i) it will help lower down the number of water-use permits, and hence make them more manageable; and (ii) it will facilitate the formation of water-user associations that will take care of multiple uses of water resources such as by designing water schemes for multiple water-uses. Thirdly, the ministry responsible for livestock should educate pastoralist groups on the advantage of having manageable sizes of livestock herds that could be maintained easily to attain quality standards of living and co-existence with their fellow farmers. This, however, may take time as it involves changing the mind-sets of pastoralists regarding livestock keeping.

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