Borana Indigenous knowledge on water resource management

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Abstract

Borana pastoralists in Ethiopia inhabit areas where there are scarce water resources and extreme climatic conditions that limit the options for alternative livelihood systems. Accordingly, the agro-ecology of Borana pastoralists is predominantly arid and often subjected to variable and uncertain rain fall patterns. It is characterized by recurrent drought that in turn disrupts livelihood of the people and biodiversity of the area. In order to cope up with such natural calamities, Borana Pastoralists have been able to develop indigenous institutions applicable to key pastoral resource management. This article explores Borana indigenous knowledge in scarce water resource management so as to bring the concept and contribution of indigenous knowledge on resource management to rhetoric views of higher education academia. There are two major water points in Borana rangeland namely: wells and ponds. Borana indigenous institutions on water resource management are led by a person holding an indigenous title known as Abba Herrega, who is responsible for maintenance of the water points and fair distribution of the available water to the community members. Besides, Borana pastoralists have an indigenous mechanism to initiate an establishment of new water sources. To this end, a person who motivates a new water source is given an indigenous title known as Ababa Konfi. A water source initiated by Abba Konfi is to be named after the name of the Konfi title bearer. Nevertheless, the water source remains to be communal property of the Borana and never a private property of the Konfi title holder. Borana indigenous knowledge plays a key role in conserving the scarce water resources of Borana rangelands where intervention of modern technology that centre on the knowledge of the community is very limited. However, Borana indigenous knowledge is in a declining trend for several factors now a day. For sustainable development in Borana rangelands, policy makers and other development agents along with the academy have to identify and make use of indigenous knowledge of the community rather than imposing alien methods.

Key words:

indigenous knowledge, indigenous institutions, water resource management

Background

Borana rangelands in southern Ethiopia are characterized by arid and semi-arid climate with sub-humid zones (Sabine, 2004). More than 90% of the population lives in rural areas (CSA, 2007) and their livelihood remain to be livestock production. According to Arero District Pastoral Development Office (2010), 60% of the total landmass are bush encroached areas, rangeland accounts for 19%, about 17% is potential farmland areas and about 2% are forest land. Rainfall is uncertain and the mean annual rainfall sometimes falls below 400mm and droughts occur once every seven years despite there is fluctuations (Sabin, 2004).

Borana pastoralists have been able to develop an exceptionally efficient indigenous key resource management that enabled them to preserve Borana rangelands at highest grazing potential in East Africa (Coppock, 1994). It is with this flexible system that Borana pastoralists matched their livelihood needs to the limited water and grazing resources in the rangeland.

Indigenous Borana institutions clearly describe the rights to water for each of the available sources. Particularly, there is an intricate well-centered system of clan-association through which other clans can claim the right to access wells. Borana customs and culture label not only those who are entitled to access certain wells, but also the order of priority for watering animals among those with entitlement. The rights required to access a source of water is related to the trustworthiness of the source and the amount of labor required for the establishment and maintenance of that source (Boku & Irwin, 2003).

The overall objective of this article is to explore indigenous knowledge of Borana pastoralists on water resource management so as to create a path way for harmonious relationship between the academic world and cultural frameworks of the community while identifying how these roles and responsibilities may be affirmed. Therefore, the study was initiated to contribute in the effort to narrow down the gap between the academia and the indigenous knowledge of the community that are believed to be vectors for development and scientific inventions.

Methodological **approaches**

The study employed a qualitative research approach under which in-depth interview, focus group discussions (FGDs) and key informant interviews were scheduled. The major reason for applying qualitative research approach emanates from the suitability of the problem under study to the approach. Hence, it is so difficult to quantify knowledge of the community. A snow ball sampling technique was applied in the selection process of the study participants. Three FGDs each with eight members were held in two selected villages namely Wachile and Gadda located in Arero district of Borana zone. The FGD's discussants comprise multi segments of the community including women, youth and the elders. For cross triangulation, an in-depth interview was held with prominent individuals on water resource management. Besides, key informant interviews were held with governmental and nongovernmental officers working on pastoral resource management. Different cases were investigated and presented to support key findings of the study. The summarized data were contextually and textually analyzed using participatory research approach tools like problem ranking wherever applicable.

Conceptual framework

Indigenous knowledge has multiple notations and different meanings and the notions are controversially discussed in different literatures (World Bank, 1999). For instance, Richards (1985) described indigenous knowledge as characterized attributes of 'ecological particularism' generated in a local

natural environment and under specific ecological relationships. Warren and Rajasekaran (1993) on the other indicated that indigenous knowledge is utilized as an information base which facilitates communication and decision making in a particular society. The agents of indigenous knowledge in this context are indigenous people, who are unique to a given context (Warren *et al*., 1995). Despite these definitions are sound enough, in the context of Borana pastoralists both definitions are narrowly presented. In case of the first, the applicability of indigenous knowledge is beyond specific locality and it is almost the same for the whole Borana in different localities as the community has one socioeconomic, religious and political institution known as Gada system. In case of the second, the importance of indigenous knowledge is beyond communication and information disseminations but every aspect of life is determined by the existing indigenous institutions for the Borana pastoralists.

In order to cope with the harsh conditions of arid and semi-arid rangelands, pastoralists successfully evolved multifaceted indigenous pastoral resource management systems. Such knowledge plays an important role to link ecological variability, flexible production strategies and local institutions for sustainable natural resource management. With indigenous knowledge, pastoralists show diverse technical and organizational skills on how to fit specific demands of their herds with the unpredictable natural resource supply (Niamir-Fuller, 1999). This point matches the result of this study as water points are one among the key pastoral resources.

The importance of pastoralists' indigenous knowledge for sustainable natural resources management depends on 'self-organizing' capacity of pastoral systems, based on institutional flexibility of the pastoralists and the ecological pliability of the vegetation (Abel & Langston, 2004). As a consequence, interventions which failed to recognize indigenous knowledge are likely to fail and make the local institutions and the eco-systems more vulnerable (Gadgil *et al*., 1993).

In the same token Breman & de Wit (1983) revealed that pastoralists' indigenous knowledge has been developed from direct interaction of community and their herds in a typical natural and social environment. Therefore, indigenous knowledge subsumes information and skills by which pastoralists can derive the highest benefits from the available natural resources

Pastoralists make use of their indigenous knowledge through flexible natural resource use strategies, which are intricate, transmitted and preserved by the interaction of the community. The effective dissemination of information is realized through agents such as herders and community leaders and elders. Thus, the coordination of natural resource use strategies with other users ultimately depends on the social networks developed within and among different user groups as it is clearly described by Niamir-Fuller (1999).

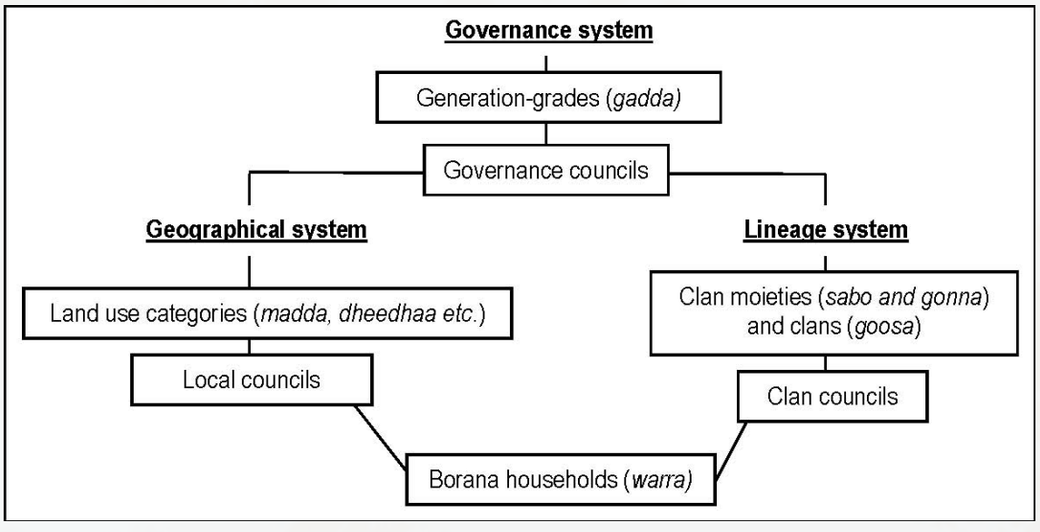
Likewise, Borana pastoralists have a chained indigenous social structure

applied to Borana rangeland resource management. The structure precisely defines the roles and responsibilities of every actor in the key resources' management so that role confusion rarely occurs among the actors and the community at grass-root levels.

Based on this conceptual review, the following structure of indigenous institutions in Borana pastoral key resource management was adopted from Sabine Homman (2004) and used to analyze the problem under study.

Figure 1: Structural overviews of Borana indigenous institutions on resource management

Source: Sabine Homman (2004:47)



Result and discussions

Indigenous institutions in water resource management

Borana pastoral water resource management involves all community members regardless of gender and age. In accordance with this, there are certain rules that direct the community in managing water resources. These rules are determined by Abba Gada (the leader of Oromo democratic institution named Gada in which Borana is one of the branches) together with council of elders or messengers of Abba Gada. The rules are to be enforced by different agents who work together. The first and the most prominent figure is *Abba Herrega* (an appointed officer who takes a leading role on water resources management). Therefore, *Abba Herrega* is appointed with the responsibility to manage water resources particularly the wells. The other figure is known as *Abba Konfi* (A title given to a person who initiates an establishment of a new water source particularly wells). *Abba Konfi* is not appointed by the community; rather the title results from a person's commitment and initiatives to establish a new water source.

Water resource use right among Borana pastoralists is based on the existing indigenous rules and everyone is obeyed to the rules. In case problem appears against the rule, *Abba Herregaa* title holder appeals to the council of elders for the enforcement of the rules of the community on water resource management.

According to the

indigenous Borana rule on water resource management, there is certain correction measures imposed upon a person who misused water resources. The measures include: to excavate about 3m^2 of under establishment water source, if he/she used any water point particularly wells for his cattle without permission from the *Abba Herregaa*. If the offender is woman, her husband and/or son will be punished on the behalf of the woman. From this, it can be said that the correction measure by itself is one way to expand sources of water in the rangelands. The study identified that there is a slight difference in the management of the two water sources in Borana rangelands.

Pond management

Pond (called *Haro*) is a seasonal and temporary source of water collected from rain during rainy season. Borana pastoralists use pond water during the wet season for both livestock and domestic consumption which contributes to reserve wells, the major water sources. In Wachile and Gadda villages of Arero district there are 22 and 9 ponds respectively. However, almost all of them are functional only during the wet season and dysfunctional during hard hit times of dry season. As a result, water shortage becomes severe in the rangelands during the dry season.

Borana pastoralists have a far excellent long lived system for successful establishment of new ponds in the effort to cope up with the inherent shortage of water in the rangelands. Accordingly, before rain season, Borana pastoralists make a preparation for collection of rain water. This is a pre condition in the establishment of a new pond. To this effect, a person from a particular clan takes an initiative action and the person who took the initiative will be provided with a title known as *Konfi*. The person holding the title has a responsibility for successful establishment of the pond he has initiated. The beginning of the initiation is marked when *Abba Konfi* makes *Qara (a sharp stick* used to mark a center for an under establishment pond*).* Once the *Abba Konfi* marked the qara (mark), all clan members of the Abba *Konfi* regardless of gender and age play their role for successful establishment of the under establishment pond.

As the activity of establishing a new pond is cumbersome and labor intensive, a lot of bulls may be slaughtered until completion of the under establishment pond. The *Abba Konfi* provides the first bull(s) to be slaughtered. The slaughtering of bull (s) during establishment of new source of water has nothing to do with witchdoctors or religious ritual. Rather to motivate and mobilize workforce for the under establishment pond. It is a kind of ceremony that calls all clan members of the *Abba Konfi* to take part in the work.

Abba Konfi is supported by *Abba Herregaa*, council elders and the Gada leaders in leading the activity. In this course, the elders and Gada leaders play directing and mobilizing roles spearheaded by the *Abba Konfi.* Able youth and men are expected to be the major sources of labor for under establishment pond. Women have also a decisive role in it. All supportive works like food preparations are the

responsibilities of women and able girls during the activity. Beyond this role, there is special rule applied upon women. Accordingly, a woman crossing the area where the work is undergoing is expected to dump out a certain amount of soil from the ongoing pond establishment. In addition, if the activity is for conservation of an existing pond, women who went to the pond for fetching water should dump out a certain amount of soil. Nevertheless, there is no kind of forcing women like old women, lactating mother and pregnant to do so. This indicates that how much the culture is gender responsive and aware of females' reproductive freedom.

After completion, the name of the newly established pond will be coined after the name of the *Abba Konfi*. For example, if a given name of the *Abba Konfi* is Lencho, the pond he initiated is named as *Hara Lencho* to mean Lencho's pond. However, the pond remains the property of the whole Borana in general and the clan of *Abba Konfi* in particular than to be a private property of the *Abba Konfi*. The naming of the *pond* after the name of the founder is for two reasons. The first is to show respect for the person who initiated a new source of water for the community. The other is to encourage others to play the same roles in the effort to fulfill the water demand of the community.

Once the first phase of establishing a new pond has successfully completed, another activity will be carried out. This marks the beginning of the second phase in pond establishment. The major activity during this phase is to make fence around the newly established pond. The purpose of fencing around pond is to protect it from damage and for its proper conservation. As to the first phase, the whole community members regardless of age and gender are expected to involve in fencing activity. The following case represents ponds with best management based on Borana indigenous knowledge.

Case 1:

There are three ponds with good conservation practices in the case of Wachile village of Arero district. These are: Haro Adi (Adi's pond), Hara Boji (Boji's pond) and Haro Dadacha Irressa (Dadacha's pond). These ponds are relatively those ponds that live long and even serve during dry season to some extent. Relatively, they respond to hard hit times of the dry season compared to the others. The community was a primary actor for the conservation of these ponds despite there was some support from government and civil society organizations in Borana rangelands. The bases in conserving the ponds were set by the community and the intervention by the government and civil society organizations is just backing the efforts of the community. The supports provided by government and civil society organizations include material and technical supports while the community participated with their indigenous knowledge on water management as well as provision of local materials and labor (Source: Own data).

Well management

Well is a deep underground water source with long period of water supply compared to ponds. Wells in Borana are divided into two sorts, *adaadii* (shallow wells) and *tullaa* (deep wells). The establishment of wells as well as dragging up water from it is labor consuming and cumbersome. The deep wells have a depth of above 30m, and water is pinched up by as many as 20 able men standing one above another and relying containers of water. The able men engaged in dragging water for wells use to chant as morale for cooperation, and hence, these wells are sometimes referred to as the *singing wells*.

Wells are limited in number and a lot of Borana villages are unfortunate to have them. For instance, there is no recent well established in the district of Arero and the concept of establishing wells is beyond the knowledge of the participants of this study. The focus group discussants at the two villages were unable to indicate the time when and the generation during which the existing wells were established. In the in-depth interview held at Wachile village with an elder (82 years old) presented the case as follow:

> *"I have never seen an Eeela (well) established in my age. The oral history from my ancestors however, indicates that the same system for the establishment of pond is applied to establish a well. There is a Konfi title to initiate an establishment of a new well. The Abba Konfi marks a center for the-would be established well. Abba Konfi also provides the first bull/s to be slaughtered so as to declare the begging of establishing a new well. As the activity takes long time and consume great labor, there might be several bull/s to be slaughtered. Those members of the Abba Konfi's clan who can do can provide the bulls turn by turn. All systems are directed by the norm of the community and at the end, the well will benefit all members of Borana even if, nominally wells bear the name of the clan of the Abba Konfi. He further stated that during the time when the current wells of Borana were established, there were no sophisticated materials to excavate wells and the common instrument used was made from sharp stick and there was no external support and all the wells were constructed by the Borana generation who lived during those periods. In case, someone is absent from the task without any justification while the establishment is going on, he will provide a bull that will be slaughtered for the labor dealing excavating the well. The name of a newly established well will be coined after the name of the clan of Abba Konfi or the name of Abba konfi. But the established well is neither a private property of the Abba Konfi nor private property of specific clan, but it is the resource of the whole Borana" (In-depth interview at Wachile).*

The study also attempted to address why the current generation of Borana failed to establish new wells and the focus group discussants underlined three suggestions. The first is that the present generation is relatively lost courage to engage in such hard activity due to exhaustion by recurrent drought and conflict in the area as well as restrictions imposed on Borana pastoralists in mobility pattern and livelihood determination. They indicated that this affects the commitment of the community in communal work that also resulted from external influences like weakening of the power of Gada system due to intervention from the contemporary system as well as limited attention to Borana indigenous knowledge. The third is that the

detection of site for potential well needs certain heavenly gifted vision and this is less visible to the current generation compared to the past. As it has been already indicated, the availability of wells varies from one village to the others. Some villages have no well at all while some have relatively large number of wells. For example, in Wachile village there are 13 wells while there is no well at all in Gadda village. In general, there are 9 villages with wells in the in the study area. These are: Web, Wachile, Borbor, Erder, Dhas, Melbane, Dubuluk, Gofa and Layi. According to the FGD at Gadda village, the last two wells (Gofa and Layi) were previously belonged to the Borana and joined the neighboring Somali pastoralists in the 2009 referendum. The discussants also indicated that these wells (Gofa and Layi) remained to be a ground for the recurrent conflict between Borana pastoralists on the one hand and the neighboring Somali clans on the other. More specifically, the five Gosa (clans) in Wachile have wells initiated by their respective *Abba Konfi*. The following table depicts those wells with the corresponding Gosa that initiated the establishment of the wells.

Table 1: Wells in Wachile village with their **respective Gosa**

Name of the well	**Responsible Gosa**	Quantity of the wells
Eela Hawatu (Hawatu's wells)	Hawatu	7
Eela Karayu (Karayu's well)	Karayu	3
Eela Digalo (Digalo's wells)	Digalo	1
Eela Galantu (Galantu's well)	Galantu	1
Eela Nonitu (Nonitu's well)	Nonitu	1
Total		13

Source: Own data

There are some wells that are excellently managed by the community reflecting the best contribution of indigenous knowledge on water management. The following case represents a case of well managed wells.

Case 2:

"Eela Qallu (Qallu's wells), located at Wachile village of Arero district was established by Karayyu clan spearheaded by Abba Konfi named Qallu. Its time of establishment is unknown. Eela Qallu is regarded as the best conserved water source in Wachile village of Arero district. Currently, it has a potential to supply water in dry as well as wet seasons and it can accommodate more than 300 livestock (Yaasaa 3) per day even if, its potential during dry season is relatively weak. In addition, there was an intervention, by an NGO, Save USA that contributed to reduce the number of chained able men from 20 to 7 to drag up water."

When we come to indigenous wells administrative systems, Borana pastoralists have a far more excellent well-focused system of clan-association through which other (associated) clans can claim right of access to wells other than their own. Accordingly, Borana customs and culture define not only those who are entitled to access certain wells, but also the order of priority for watering animals among those with entitlement. Others have to request the clan to access and the response is affirmative in most cases. Those given access must wait their turn according to the priority rights of the other herds present. As stated earlier, the major actors in wells management include *Abba Gada*, councilors and messengers of *Abba Gada*, *Abba konfi* and/or his descendents and *Abba Herregaa* (appointed by *Abba Konfi* or his descendents). Accordingly, *Abba Gada* and his councilors and/or messengers formulate regulation on management of the well while *Abba Herregaa* follows the day to day management of the well.

Conflict over water resources and Indigenous **conflict management** systems

There is no kind of conflict over water resources within or among the different clans of Borana even if, there is frequent conflict over water resources with external groups. There is a clear norm set for the community and the community acts accordingly reducing the probability of conflict incidences. As touched before, the norms on water resource distribution are set by the community and *Gada* leaders. The enforcement of the rules is followed by the *Abba Herrega* supported by respective *Abba Konfi* and council of elders. Accordingly, the *Abba Konfi* (his family*), Abba Herrega*, council of elders and the ordinary community are served 1st, 2nd, 3rd and 4th respectively.

Distribution of the available water resources to different purposes are also subjected to the existing water management norms so that conflict over the water resources for different purposes rarely appears among the Borana. In distributing the available water resource for different purposes, domestic consumption, watering of lactating cattle and calf, weak and sick livestock and small ruminants and camel are served 1st, 2nd, 3rd, and 4th respectively.

In order to manage water shortage during hard hit times of dry season; the Borana has its own system to overcome the shortage with less probability for conflict to appear. Accordingly, when there is severe shortage of water resources at a certain village, the clan of Borana suffering from the problem prefers to move to the other Borana clan areas where there is a promising

water resource. The hosting clan has to be informed ahead by the clan with the problem so that the hosting clan positively accepts them and let them share the available water resources.

However, now a day clash breaks when the Borana clan moves to the Digodi and Garri clans of Somali and vice versa. The conflict between the Borana on the one hand and the Digodi and Garri clans of the Somali on the other has a devastating effects on both material and human resources and the settlement of the problem takes longer time and followed by piece of land to either side through referendum. The piece of land that went to either side always remains a point for conflict and grievance, and creates sense of hostility between the two.

There are three major factors considered to be immediate causes for such conflict. These are attempt to use water points of the other by force without pre permission from the owner, purposive attack on water points of the other as a revenge for the permanent hostility between the two, rid of livestock of the other when moving with own livestock in search of water points. Sometimes, clash may appear when the Borana moves to the other neighboring Oromo clans of Gujji and Gabra and vice versa. But the degree of the incidence for conflict with these clans is unusual, easily manageable and minor compared to the former.

Challenges on Borana Indigenous institutions on water management

The study indicated that the existing Borana indigenous institution on water resource management is in a declining trend because of several factors that include: weakening of the power of *Abba Herrega* and community elders, conflict and attack on water sources

Table 2: Challenges of Borana Indigenous institutions on water management

Source: Own data

Challenges	Rank
Lack of proper support from concerning authorities	1
Conflict and attack on water sources	2
Mismatching of indigenous knowledge with that of the contemporary	3
Weak power of *Abba Herregaa* and *Konfi*	4
Less participation and motivation	5

(water sources became ground for conflict) and mismatching of indigenous knowledge with that of contemporary.

In relation to this, the focus group discussants at Wachile village indicated that previously, if *Abba Herregaa* accuses a person for mistreatment of water resources, there will be corrective measures against the offender according to the rule of Borana on water management. To do so, there is no need to find for witness. However, now a day, if there is such case; there must be witness for the case to take corrective measures. Hence, the issue of asking for witness is neither in the rule of the Borana nor laying and denying is culture of the Borana. In Borana community, there is no way to blame or accuse one without any ground. The serious challenges of Borana indigenous institutions on water resource management were ranked as follows, (see Table 2)

Conclusion and **implications**

Borana pastoralists possessed a long lived indigenous knowledge appropriate several factors now a day. One of the factors is imposition of alien systems by overlooking indigenous knowledge of the community. Therefore, academic investigation and intervention that focuses on the identification and upgrading of indigenous knowledge of the community is highly acknowledged. For any successful intervention in Borana pastoralist areas, development agents and policy makers along with the academy should centre on indigenous knowledge of the community rather than imposing alien approaches.

The other factor for water resource management system deteriorations in Borana rangelands emanates from recurrent conflict between Borana pastoralists and the neighboring Digodi and Garri clans of Somali pastoralists. Therefore, awareness rising on peace full conflict resolution to both sides is very important. To this effect, identifying and utilizing indigenous conflict resolution methods of the community is another means to arrive at sustainable conflict resolution in the area.

In general, water resource management to manage the scarce water sources in Borana rangelands that in turn plays a decisive role in natural resource management at the time when the world is highly concerned and working to curtail the threat of global warming. The article thus, endows with a valuable but, hidden knowledge of the community to academic world, policy makers and other development agents. It intends to contribute in the effort to fashion harmonious relationship between indigenous knowledge of the community and scientific theories of the academia that makes a path way to the flow of knowledge from bottom-up rather than from up-bottom. It also intends to prove proper intervention approaches that centre indigenous knowledge of the community in the effort to ensure environmental conservation and sustainable development. This in turn, reduces the imposing of alien approaches that might not be contextualized into real situation of the community.

Borana pastoralists' indigenous knowledge is in deteriorating trends for

has direct implications on the other key pastoral resources like pasture, natural forest and the biodiversity of the rangelands so that effect on water resources implies effect on the aforementioned resources. Therefore, in Borana rangeland management, water resource management through indigenous knowledge of the community needs primary and prior attention in managing the other key resources.

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