

Research Article

Appreciating Local People's Knowledge is the Entry Point to Participatory Forest Resources Management in the Sudan

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Abstract: Like many other countries, the failure of state's intervention to manoeuvre 'good governance' through the reservation procedures led to a situation where Sudanese forest resources became 'common-pool resources'. Hence concerned institutions progressively believe that foresters must relinquish the 'policing position' and instead facilitate a concerted and collective action by all stakeholders to sustainably manage forest resources. The critical questions are, to what extent do rural people share the perception of the 'forest' with interveners? How does variation in perceptions influence their management strategies? Can local people's knowledge contribute to facilitation of participatory sustainable management of forest resources? This study is written on the basis of empirical data collected from various individuals, groups and institutions involved in forest resource management in the Sudan. Deploying a sampling strategy based on the 'purposive sampling' and 'theoretical saturation point' a total of 165 key informants were selected from three rural locations. The study opted for the case study as the main methodological approach. Nonetheless, for the development of the cases, a combination of methodological instruments such as literature and archive study, unstructured and semi-structured interviews, group discussions and participant observation, were used iteratively. Data collection and analysis were performed involving exploration of ideas with people. The findings of this study exemplified how the behaviour of rural communities as concerns the 'forest' has been oriented and guided by their perceptions and beliefs. A characteristic of forests/trees is that their social values are appreciated differently by various social actors at various locations in time and space. In addition to the fact that trees provide food, shade, fuel; they are useful in their spiritual dimensions as well. Local people's knowledge and spirituality might provide a basis to facilitate 'collective action' to sustainably manage forest resources.

Keywords: Cosmovision, local people's knowledge, participatory forest management, perceptions

INTRODUCTION

There is no question about the fact that Sudanese forests are getting depleted (Bayoumi, 1989; World Bank, 1986; Khalifa, 1989). Rural communities discovered long ago that wildlife was getting scarce and their sources of fuel wood were getting further and further away from them. In discussions with them about the depletion of forests, they are quick to draw your attention to the issue of 'how their home was few years ago', which is their designation to what is happening to their environment.

Climate change, extinction of tree species and other environmental dilemmas are convincing concerned institutions within the development arena to exert more effort to tackle the issue of the depletion of forests. There is a long list of references as to the various initiatives in developing countries intended to resolve this problem. Among such publications are the works of Abdulla and Holding (1988), Badi (1989), Blaikie (1989), Gilmour and King (1989) and Wiersum (1997). The commonality of all these studies is the fact that rural people are treated as culprits of poor forestry management and so they are found guilty for the destructions of the forest.

Far from being naive or stupid, villagers have developed considerable wisdom through years of struggling for survival (Islam *et al.*, 2012). Among the forestry profession, the role of indigenous knowledge is also becoming more appreciated (Green and Raygorodetsky, 2010). Rocheleau (1988) argues that because trees require a lot of space and a long time to grow, rural people have a comparative advantage. For a long time they have known and been using whole systems in all their diversity and variability. Hence, local people have, over time, been able to develop a good wealth of knowledge and experiences about trees/forests.

This extremely rich knowledge and experience needs to be recognized and integrated into intervention's forest or tree management programmes. In fact, the 'policing tendencies' of intervention have prevented foresters from identifying and accepting that indigenous knowledge is the entry point to sustainable forest resources management.

The critical questions are, do rural people share the operational description of the 'forest' with interveners or do they see it differently? If they have a different perception of the 'forest', how does this influence their use

of the 'forest' and their management strategies? Can local people's knowledge amalgamate 'academic knowledge' to facilitate sustainable management of forest resources?

This study will present the various perceptions and indigenous knowledge of rural communities that this research encountered during investigations in the form of case studies. These findings are then discussed showing how they affect management strategies of local people. It concludes differences between the perceptions of interveners and that of local people about 'forest management' and therefore how development efforts are to be re-directed to take advantage of indigenous knowledge and enhance rural peoples' participation in forest management.

SCOPE AND METHODOLOGY

This study is written on the basis of empirical data collected from various individuals, groups and institutions involved in forest resource management in the Sudan.

Deploying a sampling strategy based on the 'purposive sampling' (Bernard, 1988) and 'theoretical saturation point' (Francis *et al.*, 2010; Strauss and Corbin, 1990), key informants were selected based on their experiences, occupations, social status and capability of providing well-informed and/or knowledgeable insights. A total of 165 informants were contacted during the research journey. Of these, 99 were male and 66 female.

The data was collected mainly from three rural locations, namely; Tendulti, Gedarif and Sennar. However, the authors' own experiences and those of other officials who worked in other locations, made the scope of the study not limited to the mentioned geographical boundaries. The study opted for the case study as the main methodological approach. Nonetheless, for the development of the cases, a combination of methodological instruments such as literature and archive study, unstructured and semi-structured interviews, group discussions and participant observation, were used iteratively. Data collection and analysis were performed involving exploration of ideas with people, rather than doing research on people (Walker, 1992; De Vries, 1992; Wals, 1994).

RESULTS AND DISCUSSION

General: The fact that local people are knowledgeable and experts in survival is well established and documented (Chambers *et al.*, 1989; Genin *et al.*, 2013). However, the intention of this study is to discuss the character of local people's knowledge about forest resource management.

Van Den Ban and Hawkins (1988) define perception as, 'the process by which we receive information or stimuli from our environment and transform it into psychological awareness'. The findings of this study will exemplify how the behaviour of rural communities as

concerns the 'forest' has been oriented and guided by their perceptions and beliefs.

Deforestation process: For the villagers drought is the main reason for deforestation. Many villagers say, "Trees have finished because of no rain". A village sheikh explained the way he perceives the deforestation process by saying, "Trees are like people. After reaching a certain age they die and new ones come out in their places. Now, there is not enough food for them and therefore new trees are not replacing the old ones. Because of bad deeds of man, Allah is punishing people with drought and is making the trees to disappear so that man would repent for his wrong doing. Man is no longer fit to co-exist with trees because of our bad deed. We will not interfere with Allah's wishes. If people behave well, blessings will come back".

Graveyards' trees: A common behaviour among villagers is that they do not cut trees growing at graveyards. Sometimes, even dry or dead trees are left to rot. They say, "Trees growing at graveyards belong to those who passed to the other life and a kind of respect we pay to them is by not touching their belongings. We are afraid, something might happen to us if we dare to touch trees growing at graveyards because of the spirits of those trees". They went on to give examples what the spirits of trees can do. "Once, a man tried to cut a tree, the axe stuck into the tree and caught fire".

Trees as signs of good/bad omen: Some tree species are appreciated by villagers and seen as signs of good omen. This means that in addition to the fact that trees provide food, shade, fuel, construction, livestock feeding, soil improvement and as home for some life forms, they are useful in their spiritual dimensions as well. The following are some examples:

- *Sidir* (*Ziziphus spina-christi*) tree is appreciated in Islam, villagers avoid cutting them, they might take thorns only. In some areas, villagers use '*Sidir*' leaves for treatment of the body of the dead person before burial. Villagers say, "Do not cut a '*Sidir*' tree because it is the paradise tree. It would take the dead to paradise. We do not use '*Sidir*' as firewood and do not accept people cutting it, because '*Sidir*' is a holy tree".
- '*Arak*' (*Salvadora persica*) is another tree which is appreciated by Muslims. Villagers say, "Satan does not enter the house if there is an '*Arak*' tree".
- In some villages, the bridegroom will hold a tree branch in his hand during wedding celebrations as a sign of good omen. However, other tree species are interconnected with bad omen. The following are some examples:
- Old isolated trees are the houses of *Satan*. There is the case in the village of a man who cut an old '*kuk*' (*Acacia sieberana*) tree and after only five days he died.

- It is not good to have a *neem* (*Azadirachta indica*) tree inside the house compound. "Because, it is the kind of tree which inherits your house; you will in one way or another leave your house".
"Do not plant *sunt* (*Acacia nilotica*) in the house side compound as it brings poorness to the family".
- "*Higlig* *Balanites aegyptiaca* tree host *Satan*".
- People believe that *Higlig* and *tundub* *Capparis decidua* host (houses) of *Jinn*. Villagers do not tend to approach and/or cut these trees.
- *Sesaban* *Parkinsonia aculeata* tree kills its owner". An extension officer explained: "as part of our extension programme I took some *Sesaban* seedlings to a village, but villagers refused to take them and asked me to take them back with me".
- The nature of belief sometimes becomes very strong depending on villagers experiences and location of trees. There are some trees near a mosque and people say that nobody should cut them. "Once, a man tried to cut a tree, the axe stuck into the tree and set fire". Now trees are over aged, some die out and only termites eat them. Villagers need firewood very badly but even the forester in the area declared that he dare not touch these trees.
According to Haverkort and Millar (1992) the concept of cosmovision entails that the whole nature is seen as a living being, like an animal. People being part of the nature, work and communicate with nature; "nature does not belong to man but man to nature". Thus the concept of cosmovision includes the assumed interrelationships between spirituality, nature and mankind.

Nomads' grazing community forest: Nomads in Gedarif area claimed that they have established a community forest. They were very proud of "their forest". Nomads were eager to show the forest to others. They organised a field day in collaboration with the forestry department. Reaching the area, foresters' first observation was that there are many trees which have been chopped for animals. Foresters said to themselves "Oh what a forest is this. For the last two days nomads kept telling us about protecting the forest!". One of the foresters failing to keep such a feeling for himself said: "What is this? All this cutting and you are saying that you protect the forest? From whom are you protecting the forest then?". Soon the author realized the special situation of the nomads. He took aside a group of nomads and clarified to them the purpose of his visit and explained to them that he does not work with the forestry department. Then the following conversation took place between the author and the nomads:

The author: "Why do you keep this forest?"

The nomads: "We keep it as a range for our animals to graze"

The author: "Do you think you as people who keep animals can manage without chopping some trees?"

The nomads: "We need trees for every activity we perform. Immediately after reaching the area we need wood for our settlement e.g., fixing huts, we need wood and thorns for establishing enclosures for small animals. Moreover, we need to cut some trees for the animals to graze because they need it especially at this time of the year for medical purposes. In addition, we need firewood for cooking"

The author: "Can you ask other nomads to keep away from your forest when they pass through the area?"

The nomads: "Honestly no, because we also visit other nomads in other areas and we would have not been happy if they treated us like that. Moreover, who knows maybe one day we might need these people"

The author: "Do you think nomads have a role in destroying forest resources?"

The nomads: "Of course no, they only let their animals to graze. What damage forests are charcoal making and um bahatay [uprooting trees for cropping]"

This case reflected how nomads attached a meaning to forest that was totally different from that of foresters. Moreover, it signified the process nomads deployed to guarantee permanent utilisation of their traditional grazing land. In fact there are problems between these nomads and a big merchant farmer concerning the ownership of the land. It became clear that nomads through participating in the community forestry programme were trying to legalize and legitimize their right to the land. They might be able to get foresters' support to register the land in the name of their village as a 'grazing forest'.

A characteristic of forests/trees is that their social values are appreciated differently by various social actors at various locations in time and space. Consequently, trees may have multipurpose functions, but their exact role depends on the place where they are growing and the needs of the user groups that utilize the trees (Khaleel, 1997). Subsequently, similarity between foresters' and villagers' management objectives is the exception rather than the rule. Sometimes what is important for villagers is labelled as 'of minor importance' by foresters.

Adopting eucalyptus variety: Normally, foresters recommend planting of *Eucalyptus microtheca* wherever water availability is not secure. Accordingly, *E. microtheca* was to be planted in El Aama village. During the planting period the extension office ran out of seedlings from that variety. To meet their

commitment, the extensionist gave Eucalyptus camaldulensis to villagers. The latter has smoother bark and broader leaves. However, at an early seedling stage it might be difficult for villagers to differentiate between the two varieties. Villagers planted the seedlings. Next year, the same people were supposed to plant more eucalyptus trees. But, this time they said: "We do not want seedlings like the one you gave us last year. If you do not have the other type we had better not plant this season". The author thought maybe villagers did not want the E. camaldulensis because they had experienced some period of irrigation water shortage where seedlings performed poorly and therefore, villagers want to have the other type (E. microtheca) which can withstand such harsh conditions. The forester in charge of the community forestry programme had a similar opinion. However, when villagers were asked about their explanation; astonishingly they gave a completely different explanation. They did not want this variety (camaldulensis) because poles are not as good as the other one, hence they will not fetch a good market price later. Villagers have realized by experience that microtheca's pole is better than the one from camaldulensis. They normally use the former for their houses. Once, they bought a camaldulensis pole for the mosque. Soon they discovered that it is not as good as the kind they were used to. They investigated and found out that there are different types of the eucalyptus.

The preceding case demonstrated how villagers made use of knowledge and experiences in their planning and decision-making process. It is clear from this case that villagers make use of their accumulated knowledge and experiences, give consideration to their management objectives and consequently take decisions.

Tapping gum trees: This is the case of the insect fly (*garaha*) which is believed to be associated with production of gum. After tapping the trees villagers wait for one week and if this fly does not appear they abandon tapping and say: "this season will not be a good season for gum production". Most of the villagers have not seen the insect, but hear its sound when it flies. So far, there is no "scientific" explanation for this. An extension officer says: "This year we wanted to carry out aerial spraying against locusts but villagers opposed this and said that it is better for them to allow locusts to eat and they get what remains than to lose the season entirely by killing the *garaha* fly".

Another related case: When tapping *hashab* (*Acacia senegal*) trees, villagers avoid injuring the main stem as it might kill the tree. They recommend that mainly the branches should be tapped. They say: "Do not tap the tree at its stomach".

These cases illustrated that local people's knowledge is to a great extent dependent on what

nature and their environment happens to offer (Millar, 2004). Tendulti and Sennar being traditional gum production areas, many opportunities have arisen for local people to develop a good wealth of knowledge about gum production.

Forest resources' utilization: Wood use among villagers in most cases is species-specific. However, some trees are used for more than one purpose. Villagers have developed skills to differentiate between properties of various types of trees and hence established certain uses for each type of trees:

- Villagers have realised that *kitir* *Acacia mellifera* has high caloric value and so have decided to use it for charcoal production. However, villagers use their own terms to express these kinds of findings. A villager says: "The wood from *kitir* is better for charcoal than *talih* *Acacia seyal* because it is stronger and less smoky. This knowledge I gained by experimenting and experience".
- Local people have recognized that *sidir* is termite resistant and they have used it for building their houses.
- They have realized that *sunt* wood is not affected by water; hence they have decided to use it for building boats.
- Villagers have come to know that wood from *haraz* *Fedhairbia albida* does not impart any objectionable odour and that normally *haraz* trees develop good log sizes and consequently, they have used them for making traditional oil mills.
- Some villagers refer to *sunt* trees as the 'doctors'. For medicinal uses they boil *sunt* leaves and use it for curing eye diseases. The sap or 'milk' of *Ushar* *Calotropis procera* cures people from scorpion bites.
- In some villages women use leaves of *sidir* trees for hair dressing.
- Villagers do not only use tree parts for curing diseases, but also they have developed some kind of preventive medicines. Villagers told us about certain parts of trees which can protect ten persons from scorpions and snakes. They call it '*Damin Ashara*'.
- Branches and roots of *Arak* trees are used as tooth brush.

This study indicated that whereas foresters have for long concentrated their efforts on silviculture and developed rich experiences regarding nursery techniques and plantation technologies, the area of forest utilization and wood uses in Sudan remains the domain of local people. Villagers have developed an enormous knowledge about forest utilization. A wood technologist at the Faculty of Forestry declared: "So far we have done very little in this area; most of the Sudanese wood/timber

utilization is based on local people's own experiences and is not on a 'scientific' basis".

Local people's knowledge and forest management in Sudan: How people use resources is the best guide to their management regimes. "Forest Management deals with the overall administrative, economic, legal, social, technical and scientific aspects related to natural and planted forests. It implies various degrees of deliberate human intervention, ranging from actions aimed, at safeguarding and maintaining the forest ecosystem and its functions, to favoring specific socially or economically valuable species or groups of species for the improved production of goods and services" (FAO, 1993).

Like elsewhere, in Sudan the failure of officials' intervention to take over resource management control from the local population and the failure to manoeuvre 'good governance' through the reservation procedures led to a situation where Sudanese forest resources became 'common-pool resources' (Wade, 1987) that are potentially subject to congestion, depletion or what Hardin (1968) refers to as the 'tragedy of the commons'. At present, rural people are expected to 'come in' again to manage forest resources together with state institutions (Abdulla and Holding, 1988; Khalifa, 1989; Khaleel, 1992). The question is: whose management strategies will be implemented?

The cases presented in this study illustrated that rural communities view the tree as fulfilling their lifelong desires. Hence, it is their desire to make sure that the 'trees do not disappear' and they are constantly making efforts to guarantee this. Nevertheless, contrasting the sectoral segregated approaches to natural resources management which is normally followed by governments and development projects, rural people do not see forest or tree planting as a separate activity. The management of trees and shrubs is actually part and parcel of their overall land use strategy (Van Gelder and O'Keefe, 1995). It is also part of their spirituality (cosmovision) and so part of their self identity. This demands a holistic approach to the issue of forest resources management (Ball, 2010).

Guèye and Laban (1992) indicate that for the local people to have and perform natural resource management responsibilities, they must have an economic interest or other benefits in addition to the necessary competence (knowledge and technology). They should also have strong local organizations to facilitate 'collective action' (Wade, 1987; Poteete *et al.*, 2010). Consequently, apply group control over the behaviour of the group members, control over the equitable distribution of products and the ability to exclude outsiders.

The cases of the study beforehand exemplified that the spirituality of rural people provides a basis for managing common property in such a way that the 'tragedy of the commons' is mitigated. They showed how graveyards and some religious grounds still maintain their vegetation cover when other areas are grossly depleted. It would be extremely useful to build into natural resources

management strategies the indigenous ways of managing sacred lands and shrines.

One should not therefore see forest management as 'forest policing' (Turyahabwe *et al.*, 2007). Instead there is a need for a concerted and collective action to save the environment and sustainably manage forest resources. Foresters must relinquish the 'policing position' and help reinforce local organizations to actively participate in the process. This is the challenge for stakeholders all if they really want to manage forests/trees in a sustainable manner.

CONCLUSION

- A characteristic of forests/trees is that their social values are appreciated differently by various social actors at various locations in time and space. In addition to the fact that trees provide food, shade, fuel; they are useful in their spiritual dimensions as well.
- It is clear that villagers make use of their accumulated knowledge and experiences in their planning and decision-making process.
- Local people's knowledge is to a great extent dependent on what nature and their environment happens to offer. At traditional gum production areas, many opportunities have arisen for local people to develop a good wealth of knowledge about gum production.
- Whereas foresters have for long concentrated their efforts on plantation technologies, the area of forest utilization in Sudan remains the domain of local people.
- There is an urgent need to relinquish the 'policing position' and instead facilitate a concerted and collective action by all stakeholders to sustainably manage forest resources. However, to perform such responsibilities, local people must have a social/economic interest in addition to the necessary competence and strong local organizations to facilitate 'collective action'. Local people's knowledge and spirituality might provide a basis for such endeavour.

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