Indigenous knowledge of rural women in livestock management and feeding in some agro-pastoral communities of Sudan

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Summary

A study was carried out in pastoral and agro-pastoral communities of Western (North Kordofan) and Eastern (Kassala) States of Sudan to investigate Indigenous Knowledge (IK) of rural women in some livestock management parameters. The research examined women's IK in feeding the pregnant animals, the small and sick animals as selected groups. The study had examined whether women supply these selected groups by special feed stuff and whether women traditionally know how to differentiate between the harmful and most nutritive plants in pasture. The study findings revealed that women in agro-pastoral communities had valuable IK in livestock feeding. However, it was documented that women in North Kordofan State were more knowledgeable in feeding different selected groups than those in Kassala State.

Introduction

Traditional, local or Indigenous Knowledge (IK), is defined as the systematic body of knowledge acquired by local people through the accumulation of experiences and intimate understanding of the environment in a given culture (Rajasekaran, 1993). IK is unique and seen in contrast with the knowledge generated within the international system of universities and research institutes (Butler and Waud 1990). It varies in response to different roles, age and status within a given group, and provides the basis for local decision-making (Warren, 1991).

The growing awareness of (IK) in development initiatives could bring long-term benefits. Nevertheless, the role of IK in strengthening the development process was not discussed seriously until the early 1980s (Warren, 1987). Moreover, there is little critical examination of the value of women's indigenous knowledge in relation to identified problems and available resources (Helen *et al*., 1995).

Studies revealed that, some women have managed to increase their production and revenues by developing innovations based on their accumulated experience in the activities they used to practice. Women innovate not only to increase income, but also to decrease their workload. The major area of remarkable innovation is found to be livestock keeping and food processing (MOST/NUFIC (IK- Unit), 2001). Determining how to use women's IK base innovations in modern Science and Technology (S&T) remains a problem in modern science. On the other hand, women are viewed as recipients of knowledge, rather than generators. The main focus is on transferring technologies to women through "training" and equipping them with the "necessary skills". This emphasis on delivery to women the necessary management skills and technologies detracts from examination of their existing capacity (Helen *et al*., 1995).

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In many societies women are in charge of feeding animals in a cut-and-carry system. Literature reviewed might give hints in some detailed women IK according to their responsibilities and tasks (Paris, 1988 and FAO, 1983). Among the Maasai of highland Kenya and Tanzania's Maasai Steppe, women manage small ruminants and use them intentionally to control bush encroachment and avoid damage to grass during critical periods (Jacobs, 1980). While the Samburu of Northern Kenya girls (12 – 18 years' old), herd sheep and goats.

They change the direction in which the herd goes, depending on their knowledge of range resources (Shikano, 1984).

In one instance, Zaghawa women in Chad know which part of the rangeland contains wild cereals, which they harvest for their families. Herders are not allowed into these areas until after the cereal harvest. This has the added benefit of ensuring that these grass species are not overgrazed (Tubiana and Tubiana, 1977). Among the Yemenis, it had been reported that, both shepherds and shepherdesses have a vast indigenous knowledge of the best grazing grounds, on which they base daily decisions for the optimal use of forage and of pasture rotation systems in order to prevent overgrazing (Kessler, 1987). In general, women take good care of the animals and know exactly what to feed them and how to keep them healthy (Maarse, 1989). Also 75% of Fulani women interviewed said they went on transhumance with their husbands and knew all about range-lands (Henderson 1980).

However, in systems where women are in charge of animals kept at the homestead, women obtain a detailed knowledge of the land by monitoring the condition of the range through the milk produced, and by observing the state of the animals returning to camp (Niamir, 1990). Women have a distinct advantage over men when it comes to feeding small penned animals because of their access to household wastes and by-products of food processing and crops (Okali and Sumberg, 1986).

Detailed knowledge of natural resources is often linked to specialization. Among the Mbeere of Kenya, older women know annual herbs best because they gather them for food and medicine and young herders have a particular understanding of varieties of edible wild fruit because they eat them on the way (Brokensha and Riley, 1980). The aim of this study is to:

- Explore the indigenous knowledge of women in agro-pastoral communities of Eastern and Western Sudan in livestock management and feeding of selected groups of animals, (the small, the sick and the pregnant).
- Explore whether women can differentiate between the various feed stuff with regards to their nutritive value in range-land.

Research Methodology

The study areas:

The field work was carried in Western and Eastern parts of Sudan, where the majority of pastoral and agro-pastoral communities are found. The Western part of Sudan was exemplified by North Kordofan State where four sites were randomly selected for the study purposes, namely Warshal, Farig Gebrus, Alsonut, Alkhurasana and Abu-shara . Kassala State was taken as an example of the Eastern parts of Sudan. Five sites were randomly selected, namely Ademusa, Dablawit Sinkat Kinab, Abo Talha, Dablawit School and Humadab, Figure (1) shows the selected sites of the study.

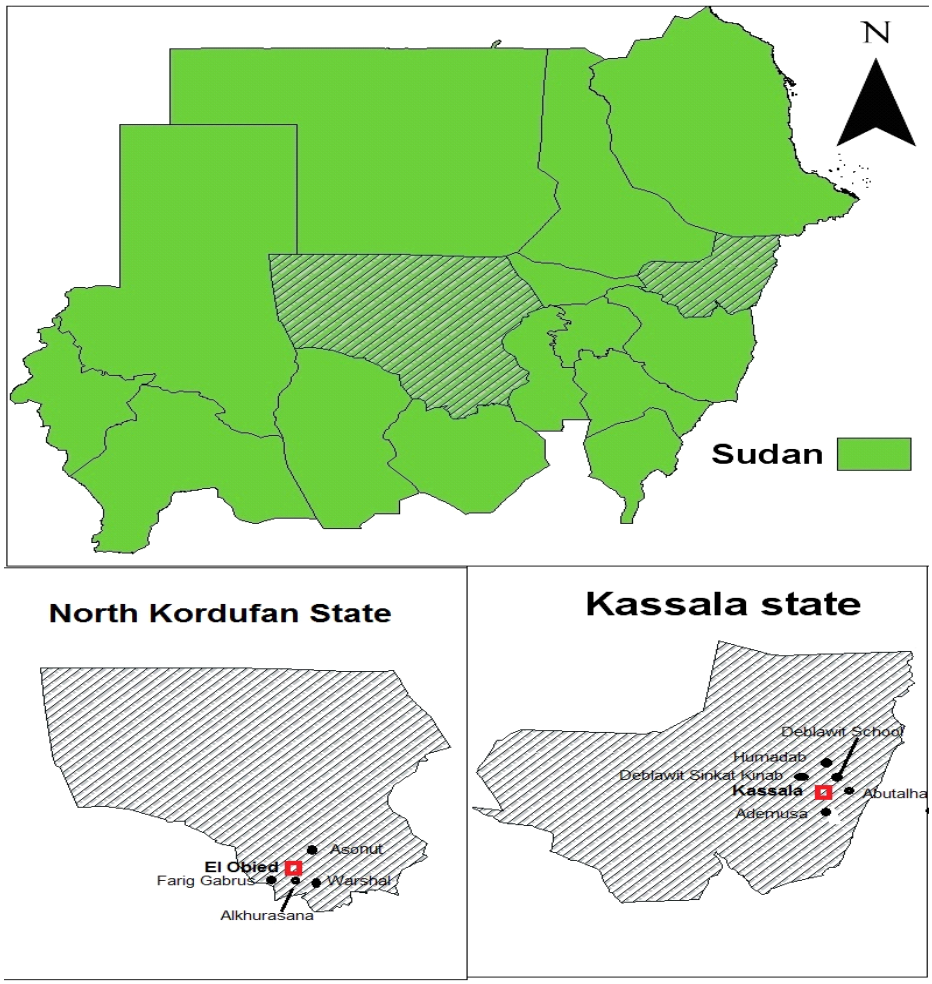

Figure 1. Sites of the Study

Methods and Techniques

In order to fulfill the objectives of the research both qualitative and quantitative techniques of data collection were used. A well -structured questionnaire with direct closed and open- ended questions was used to elicit information from key informants. Personal and group interviews were also used. The data was collected as follows:

Group interviews with women

As an entry point for individual interviews groups of women from the different communities were interviewed to provide personal profile of the individual participant, and that was very useful for the selection of personal interviews.

Personal interviews with

a. **Women**: Personal interviews with women were used to explore their role in livestock management. To obtain information multi- choice answers and open-ended questions to encourage respondents were both used. In this regard indicators of social conditions including ethnicity, age, education level, marital status, daily routine of work, moving or settling in the community and relation with other communities, were collected. The other part of the interview put emphasis on the individual indigenous knowledge and practices of management and feeding of the various

groups of livestock (young, sick and pregnant animals) and the knowledge of the harmful plants and the nutritive value of feed and pasture. Another category of respondents was those who are directly involved in extension services, policy and planning for rural development. In this category the following groups were interviewed.

b. Government officials: at the local or state Level, specially researcher, and extension workers in the concerned Ministers of Agriculture, Social Development and Education and in addition to the specialized unit of extension and rural development.

c. Development staff: selected representatives from international, national and local Non Government Organizations (NGOs) who work with pastoralist communities were also interviewed to investigate their role in conserving and/ or promoting pastoral women skills.

d. Tribe leaders: Interviews with tribe leaders was done to capture their perception around women intervention and involvement in initiatives regarding management and development of livestock in their communities using their own indigenous and traditional knowledge.

Analytical techniques

Collected data was coded and analyzed using Statistical Packaging for the Social Sciences (SPPS/PC version 11.5). Descriptive statistics such as means and frequency were used. Cross tabulation between some variables was used also to show link and relationship between two or more variables wherever needed.

Results and Discussion

The findings of the groups studied revealed women's indigenous knowledge in livestock feeding in North Kordofan and Kassala States among agro-pastoral communities in Sudan.

Tables 1 and **2**, revealed the study findings in livestock feeding, in North Kordofan and in Kassala State respectively. While **Table 3** shows results in the whole sample.

Results shown in **Table 1** indicated that, in North Kordofan State women were more knowledgeable in animal feeding and nutritional issues, compared to women groups in Kassala State as shown in **Table 2** . For example in North Kordofan state in Alsonut site, women were well informed about feeding the three different groups. While in Kassla state, as shown in **Table 2** there was one group found in Dablawit Sinkat Kinab that had information on how to feed the selected groups (100%).

Neverthe less three groups of women in Kassala State, showed no knowledge or information about how they feed the selected groups.

Table 1. Women's IK of feeding selected livestock groups North Kordofa State

Site	Pregnant animals	Young animals	sick animals	Total
Aboshara	+	-	-	33،00%
Alkhurasana	-	+	-	33%
Alsonut	+	+	+	100%
Gebrus	-	+	-	33%
Warshal	-	+	+	67%
Total	40%	80%	40%	

In this and subsequent tables (+) refers to women acquired IK, while (-) to those have no IK.

Table 2. Women's IK on feeding selected livestock groups- Kassala State

Site	Pregnant animals	Young animals	Sick animals	Total
Dablawit school	-	-	-	0%
Humadab	-	-	-	0%
Dablawit sinkat kinab	+	+	+	100%
Adomusa	-	-	-	0%
Abotalha	-	+	-	33%
Total	20%	40%	20.00%	

Table 3. Women's IK of feeding selected livestock groups -Whole Sample

State	Pregnant animals	Young animals	Sick animals
North Kordofan	40%	80%	40%
Kassala	20%	40%	20%
Total	30%	60%	30%

Table 3 revealed how feeding young animals is known among most women, in six sites out of 10 sites in the whole sample (60%). While, half of this group (30%) had the knowledge in feeding the two other groups, the sick animals and the pregnant animals as well. However, there were some differences in women's knowledge regarding feeding of the selected animal groups when tackling each State separately.

IK of women in animal feeding was examined also by exploring their knowledge in differentiating animal feed stuff in range-land to either nutritive or toxic types as shown in **Table 4** below.

Table 4. Women's IK of feed stuff -whole sample

State	Nutritive feed stuff	Toxic feed stuff
North Kordofan	80%	80%
Kassala	20%	40
Total	50%	60%

Table 4 showed half of women in the study sites (50%) have IK in differentiating nutritive feed stuff, whereas more than that, (60%) from the whole sample knew more about the harmful feed stuff. **Tables 5** and **6** represented women's IK in feeding stuff in North Kordofan and Kassala States, respectively.

Table 5. Women's IK of feed stuff –North Kordofan State

Site	Nutritive feed stuff	Toxic feed stuff	Total
Aboshara	-	-	0%
Alkhurasana	+	+	100%
Alsonut	+	+	100%
Gebrus	+	+	100%
Warshal	+	+	100%
Total	80%	80%	

Table 6. Women's IK of feed stuff-Kassala state

Site	Nutritive feed stuff	Toxic feed stuff	Total
Dablawit school	-	-	0%
Humadab	-	-	0%
Dabalawit sinkat kinab	-	-	0%
Adomusa	-	+	50%
Abotalha	+	+	100%
Total	20%	40%	

Tables 5 and **6** show that women in North Kordofan State were knowledgeable in livestock feeding and nutritional issues, more than women in Kassala State. While (80%) of respondents in North Kordofan State knew how to differentiate between nutritive and harmful feed stuff, 40% of respondents in Kassala State were found to have no information on such issue.

Examples of useful nutritive feed stuff in North Kordofan were stated as follows: Karkadi (*Anghara*), Arabic gum (*Hashab*), cakes and immature Arabic gum

(*Hashab*). And useful feed stuffs in Kassala State were exemplified by sorghum (*dura*) and (*Alhantout*). While examples of the toxic or harmful feed stuff in North Kordofan State were exemplified by (*Umshielieni*). This information was documented in both Alkurasana and Alsonut sites. (*Algudar*) had been mentioned in Alkurasana site, also (*Magrain* or *Alsura*) trees in Alsonut site, and both types were mentioned to cause bloat. Women in Alsonut site had mentioned more information about (*Karkadi*), although it was classified among the nutritive feed stuff but as they stated if fed to young animal during the rainy season it causes colic and diarrhea. Women in Gebrus site classify (*Gulum*) trees as toxic trees and cause (*gadar*), which is stiffness following death.

However, few women in Kassala State have knowledge of harmful feed stuff. For example in Adomusa site women had mentioned (*Humadab*) grass that

causes bloat to animals. In Abo-Talha site they mentioned (*Tamer Abona*) as an example of toxic feed stuff.

IK of women had further been examined by taking into consideration whether women supply selected groups (sick, small and pregnant animals) by special feed stuff. Results revealed that women in North Kordofan State supplement those animals by feeding diets composed of cakes and dura. Their knowledge extends to feeding young animals by using what was known locally as *Alsdar*, which is a process of feeding young animals by covering two teats of udder for milking and leaving the other two uncovered to be available to young animals for suckling whenever they need.This was found in the majority of North Kordofan sample, representing (80%) compared to (40%) in Kassala State sample.

As stated by FAO (1983) Egyptian women, and Indian women (Paris, 1988), had detailed knowledge of the best kind of feed for each type of animal.The research findings in this study verified that women in North Kordofan State possess valuable IK on livestock feeding.

Results had also shown that women in North Kordofan State were more knowledgeable in feeding different selected groups than their counterparts in Kassala State. They supply pregnant animals by cakes and sorghum *(dura)*, and used what is locally known as *Alsadar* process for feeding young animals.

When comparing women's knowledge on the degree or extent of differentiating between nutritive and harmful feed stuff, the study findings stated that, women in North Kordofan State were well informed about feeding and feed stuff, too. These findings might be explained when linked to the degree of settlement of women in the two areas. While in Kassala State, nomadic style of life among the respondents is nonexistent, almost half of the sample (48%) was found to be nomadic in North Kordofan State. So, transhumant women in North Kordofan State had the opportunity to know more about pasture during their mobility, unlike women in Kassala State who were more or less were settled groups.

This was also documented by Henderson (1980), who found that Fulani women, who went on transhumance with their husbands, knew all about range-lands. Also Brokensha and Riley (1980) stated that detailed knowledge of natural resources is often linked to specialization.

It could be concluded that women in agro-pastoral communities in Sudan have valuable IK in livestock management and feeding, particularly livestock groups that women were responsible for feeding and managing like small, sick and pregnant

animals. The findings also revealed that 60% of the whole sample has IK in feeding young animals while 30% knew how to feed sick animals and/ or pregnant animals

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