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**Review article**

## **The significance of engendered indigenous knowledge systems in smallholder animal agriculture in Sub Saharan Africa**

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### ABSTRACT

The subject of gender and animal agriculture has attracted attention in recent years, primarily from the need to addressing the gender divide and fulfilling the special needs of women in food production. Animal agriculture is severely constrained by the presence of a wide range of factors that affect both production and productivity of livestock, especially in the poor rural farming communities that don't have the access to modern and/or conventional livestock management skills. Women in particular, face a number of interlinked constraints that reduce their sustainable contribution of indigenous knowledge to animal agriculture and food security. As a result of this scenario, enhancing animal agriculture; gender equality and utilization of indigenous knowledge as means of promoting food security and reduce poverty has been a challenge in Sub Saharan Africa. It is believed that within the small-holder livestock production systems which is characterized by a generally low input-output system, the sustainability of animal agriculture efforts need to consider indigenous knowledge system as a dominant factor in improving production. Identifying indigenous knowledge systems in animal agriculture that support women's roles and effort as livestock owners, processors and users of livestock products while strengthening their decision-making power and

capabilities, are key aspects in promoting women's economic and social empowerment, and consequently provides a way to enable rural women to break the cycle of poverty. Women play an important role in animal agriculture through management, processing and marketing, acting as animal care providers, livestock feed gatherers, and animal birth attendants. They take care of milking of animals, although not all women control the sale of milk and its products. Raising awareness concerning the value of gendered indigenous knowledge related to the sustainable use and management of animal agriculture is crucial for alleviating food insecurity and enhancing rural development. The discussion attempt to explore the role of engendered indigenous knowledge systems as they relate to animal agriculture and their implications for improving animal agriculture and food security in Sub Saharan Africa.

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## **1. Introduction**

Animal agriculture is generally considered a key enterprise for rural livelihoods and offers advantages over other agricultural sectors as an entry point for promoting gender balance in rural areas. The crucial role of animal agriculture, within the agricultural sector, in contributing to rural livelihoods, and particularly those of the poor, are well-recognized (Upton 2004). Large proportions of rural households in developing countries keep livestock as part of their farming operations and these animals contribute to meeting household consumption needs, social needs at festivals and ceremonies, and income (Aklilu et al., 2008; Millar, 2001; Waite, 2000; Okali and Sumberg, 1985). Given the important role women play in animal agriculture world over, focusing on the unique challenges women face such as limitation in contribution of their animal agriculture indigenous knowledge has a far reaching implications for livestock production and food security.

Matsika (2012) defines indigenous knowledge as the traditional and local knowledge that exists and is developed through the experiences of the local community in the process of managing the conditions or context that challenge the people's everyday life. According to Warren, (1991) is that knowledge that is unique to a given culture or society or particular ethnic group. It is generally localized, having been developed through traditional practices for the management and conservation of biological resources on which the society depends. Consequently, it is a complex body of knowledge, skills and technology, which belongs to a particular geographical community (Ndangwa, 2007). This review subscribes to the fact that indigenous knowledge is knowledge outside of the formal scientific realm held by local people in a specific geographic area (Otto, 2008). Since it is based on practical experiences, it can be preserved and harnessed for the benefit of both present and future generations, which live in these communities. The use of indigenous knowledge has been seen by many as an alternative way of promoting animal agriculture in poor rural communities in many parts of the developing world.

Women's indigenous knowledge about agriculture, including livestock-raising, is a "largely untapped reservoir of intellectual wealth and experience ... and a valuable asset that must be capitalized upon and integrated into the development process" (IFAD 1991a). Rural women have many roles, and responsibilities through possession of indigenous knowledge that differ from those of men. Women in general have more in-depth knowledge of traditional medicine and pharmaceutical practices than do men (Hoskins 1981), and carefully tend sick animals (Henderson 1980). Frequently women are more comfortable with traditional veterinary care than with modern techniques and medicines. This may be linked to their image as the nurturers and healers of society. But despite their considerable involvement and contribution, women's role and indigenous knowledge in animal agriculture has often been

underestimated or, worse ignored. This is on the backdrop that rural women constitute more than a quarter of the world's population, and are dually a vulnerable group (FAO, 1994).

## **2. Extending women's indigenous knowledge through appreciating gender role differences in animal agriculture.**

In Sub Saharan Africa, women now constitute the majority of small-holder farmers, providing most of the labor and managing a large part of the farming activities on a daily basis (Saito et al., 1994). According to FAO (1994) women contribute between 60 and 80 percent of the labor for food production, both for household consumption and for sale. It is then paramount to give significant attention to the link of indigenous knowledge and gender based work in animal agriculture from the point of research, identification of opportunities, and development of applicable models in livestock production. This on the background that women play a key role in running households and make major contributions to animal agriculture production. In this regard, when women are economically and socially empowered, they become a potent force for change using their indigenous knowledge in animal agriculture. However, the inequalities that exist between women and men make it difficult for women to fulfill their potential and make use of their indigenous knowledge to promote animal agriculture. Women are at a disadvantage at the household, community, and societal levels, despite being the key to the animal agriculture development challenges, especially throughout the developing world. In all livestock keeping communities, women are the most important labor force, engaged in multiple ways in animal related work and because animal agriculture and management are joint activities in rural households, this sector offers an excellent entry point to gender equality.

The use of indigenous knowledge has been seen by many as an alternative way of promoting animal agriculture in poor rural communities in many parts of the world but however gender stereotypes and cultural barriers have been major constraints in local management and use of indigenous knowledge by women in animal agriculture. It must also be noted that some indigenous knowledge is held by specific groups or members of a community, restricted to one gender, hence in this case, women often hold unique knowledge unknown by others in the community, and therefore must be included in decision-making related to animal agriculture due to the added value of their insight and knowledge. Indigenous knowledge has been shown, in certain cases, to be effective, sustainable, environmentally friendly and practical (Moongaa and Chitambo, 2010). Denton (2002) noted that women are at the center of sustainable development and that ensuring greater gender equalities in all sectors would mean that society as a whole will benefit. They keep record of events and are able to recall past extreme events that had drastic impact on animal agriculture which is pertinent in any decision-making processes related to animal agriculture. Women provide most of the labor and manage many phases of the animal agriculture production cycle farms on a daily basis. However women's indigenous knowledge appears not to be fully utilized which gives an impression that women's potential productivity in animal agriculture is low, nor that women's role in agriculture can be neglected. On the contrary, evidence shows that the apparent low productivity of women is a result of the failure to adequately utilize their indigenous knowledge especially in male dominated environment. Finding ways to increase women farmers' awareness of the gender-related inequities they face and the resulting inefficiencies and to give greater practicing space in animal agriculture are some of the most important challenges currently faced in animal agriculture in Sub-Saharan Africa.

## **3. Gender, climate change and indigenous knowledge related to animal agriculture**

Indigenous knowledge is a critical building block in response to climate change mitigation and adaptation. Mitigation and adaptation efforts should systematically and effectively address gender-specific impacts of climate change in animal agriculture. In the light of recent trends in the area of climate change induced animal agriculture production challenges, through the rapid pace of change in the climatic context over the past few decades which has outpaced the ability of local coping systems based on indigenous knowledge. The viability of the existing animal agriculture indigenous knowledge practices depends on finding of the right balance between technology and local practices assuming greater

importance in this regard. Gender-based indigenous knowledge, which and has evolved through decades with the domestication of animals is critical for responding to climate change related risks at the local level (Agrawal, 1995; Nyong et al., (2007). Due to the changing climatic conditions which Sub Saharan Africa has already witnessed, many severe climatic induced vulnerability such as decline in rainfall amounts and intensity, reduced length of rain season and increasing warm and occasionally very hot conditions has affected animal agriculture and food security. Animal agriculture will need to adapt to higher ambient temperatures, lower nutritional value of feed resources and new diseases and parasites occurrence. Animal agriculture systems based on pastoral or rangeland grazing husbandry systems, ecological destruction through climatic variability and overgrazing due to high stocking rates in areas where feed and water has been compromised due to high temperatures caused by climate change does not augur well for future livestock productivity. The use of gendered indigenous knowledge may be seen as an alternative way of promoting animal agriculture in the context of the recent trends in climate change and variability. The first step is the acceptance by the stakeholders working with local communities of its assumed inherent value as part of a shift in addressing the direct concerns of the poor on climate change and variability issues. Without doubt, there is a conviction in many quarters of the need to tap into the stock of gendered indigenous knowledge if appropriate planning and animal management strategies are to be developed in a sustainable way to counteract the effects of climate change to improve production. The need for gendered animal agriculture indigenous knowledge emanate from the fact that women are not only vulnerable to climate change but they are also effective actors or agents of change in relation to both agricultural mitigation and adaptation strategies. Women often have a strong body of knowledge and expertise that can be used in climate change mitigation, disaster reduction and adaptation strategies (FAO, 2008). Furthermore, women's responsibilities in households and communities, as stewards of natural and household resources, positions them well to contribute to livelihood strategies adapted to changing environmental realities. It is believed that conventional science can help reduce animal agriculture vulnerabilities to accelerated changing conditions while indigenous knowledge can support seamless integration of these practices into the local context. UNDP (2010) view women as valuable contributors to adaptation work as they can be community leaders and natural resource managers who can help develop strategies to cope with climate-related risks. Indigenous knowledge includes gender defined knowledge of indigenous animal species, especially risk loss of livestock; herd accumulation; use of supplementary feed for livestock; reserving pasture for use by young, sick and lactating animals in case of drought; disease control in livestock, use of indigenous techniques in the management of pests and diseases in animal agriculture; culling of weak livestock for food; and multi-species composition of herds to survive climate extremes. For effective adaptation of animal agriculture to climate change, women need to be supported so as to enable them to become active contributors of indigenous knowledge in developing and designing adaptation strategies which will benefit both men and women in livestock production. Climate variability is now a particularly important driver of animal agriculture systems through its effect on vulnerability of production systems to extreme temperatures regimes and water availability. This has affected the quantities and types of animal products produced as well as production-related income especially for the poor resource farmers. In order to be able to adequately address animal agriculture and food security in the context of climate, there is need for Sub Saharan Africa to carry out thorough climatic vulnerability and adaptation assessments studies which take into account the possible harmonizing scientific knowledge and gendered local knowledge for maximum production. It is thus important to identify gender-sensitive strategies for responding to animal agriculture crises caused by climate change. These efforts should focus on: reducing women's vulnerability, in tandem with men's susceptibilities; promoting gender sensitive emergency responses; and enlisting women as key actors in animal agriculture and tapping on women's indigenous knowledge and skills in mitigation and adaptation efforts.

#### **4. Gender, indigenous knowledge systems and local animal genetic resource utilization**

There can be little doubt that the opportunities for utilization of local species are greater if farmers realises the necessity for exploring indigenous knowledge adaptive measures in animal agriculture in Sub Saharan Africa. Through indigenous knowledge efforts have been established to characterise stable

livestock species that have now adapted to stressful environment, these could possess desirable qualities needed in future to enhance food security. The merit of the local animal genetic resources, apart from their ability to adapt to stressful environment are a valuable asset to the smallholder farmers as they provide their basic needs. The use of indigenous has been successfully targeted at the utilization of local animal genetic resources. Well adapted traditional animal species will most likely, play a very significant role in smallholder animal agriculture because of their ability to adapt to the different local environment. Traditional livestock species have over many generations been reared using indigenous knowledge under low management levels prevalent in the most smallholder livestock sector. Reared under indigenous knowledge systems local animal species they have the most critical value of this adaptation through their survival instinct. The local animal genetic resources have been long recognized in smallholder animal agriculture production system as a result it is crucial to diligently identify, characterize, preserve, tap and encouraged maximum utilization. Interventions to improve poultry production are often seen as a way to reach poor rural women to improve their livelihood (Rushton, 1998). Developmental intervention strategies that intend women to be the main beneficiaries should examine how changes will affect them and how much control they can exert. In Niger most women own some sheep, which allows women to realise some income, form part of their savings and is a source of prestige (SDC, 1999).

### **5. Gender, animal health and indigenous knowledge in animal agriculture**

Conventional animal health technologies can complement indigenous remedies for certain diseases if no effective indigenous remedies are available. The smallholder livestock farmers utilize more local remedies, which are several times cheaper than modern drugs. Not much is needed in terms of investment, however on the other hand increasing livestock productivity hence improving the smallholder livestock farmers' monetary profits as well as their household nutrition. Any practice which are based on indigenous knowledge enjoys a high rate of acceptability in local communities. Indigenous knowledge is being preserved in a continuing way as a result empowering and encouraging the participation of smallholder farmers in animal agriculture. Provision of animal health management in smallholder animal agriculture sector is plagued by numerous constraints, including the erratic supply and prohibitive expense of veterinary drugs and supplies, poor communication facilities, and a shortage of manpower. Promoting complementary use of indigenous and conventional veterinary medicine for sustainable animal agriculture production, and the conservation of medicinal plant resources is among the appropriate interventions to improve livestock production. Traditional livestock health care systems, based in indigenous knowledge, seem to add value to the formal livestock health care sector, partly because both the government and the private veterinary services, in certain cases, do not adequately meet the needs of the traditional livestock sector (Holden, 1999). The evident climatic variability is likely to pose new challenges in smallholder animal agriculture production sector. The incidence of diseases and life cycles of disease pathogens and their epidemiology are likely to be altered drastically with the anticipated environmental changes caused by climate change (Moongaa and Chitambo, 2010). Such range alterations will influence changes in the development, habitats and distribution of disease vectors causing them either to be restricted or enhanced. Women are typically responsible for sick animals in addition to milking ewes, processing and selling milk products, providing feed/fodder and water, caring for newborn animals may be at the centre of animal health management. Through multidisciplinary collaboration with government departments, private sector and non-governmental organizations, it is necessary to document the indigenous treatment of various diseases and ailments of livestock. Ailments of livestock can be treated using effective indigenous remedies that were used by local communities many years before the arrival of conventional drugs. The practice depends above all on indigenous farmers' knowledge.

### **6. Implications**

The need to focus on women's role in animal agriculture and their contribution through specific indigenous knowledge, can be an effective strategy for animal agricultural development. This is on the background that it has become increasingly clear in sub-Saharan Africa that women have a significant

role in animal agriculture activities in most countries in the region. Nevertheless, a complex set of rights and obligations reflecting social and religious norms prevail within rural communities; these dictate the division of labour between men and women and act as constraints to women's indigenous knowledge contribution to animal agriculture. An appreciation of women's indigenous knowledge and understanding of women farmers' role, its importance and these constraints is a prerequisite to devising policies to improve productivity and socio-economic development through animal agriculture. Local practices and experiences are the basis for animal agriculture production and further development has to take them into consideration. Utilization of indigenous knowledge that are economically feasible, socially accepted and at low risk for smallholder livestock farmers is crucial in sustainable animal agriculture. Special attention has to be oriented towards the women's contribution to local animal agriculture through their indigenous knowledge. There is need to generate and document information concerning the gender dimension of indigenous knowledge in animal agriculture and their implications for livestock productivity. The discussion concludes that without specific attention to women contribution of indigenous knowledge in animal agriculture may reinforce inequalities between women and men, and may even increase productive resources imbalances. This on the understanding that caution needs to be maintained regarding the fact that indigenous systems often come with their own baggage of social practices that can, and sometimes have been, interpreted as gender insensitive. It must be emphasized that addressing gender indigenous knowledge disparities is an indirect integral part of enabling women to guarantee their families'—and their own—well-being through animal agriculture. It is therefore, suggested that indigenous knowledge contribution from women should be encouraged, while efforts should be made to blend the traditional and conventional (improved) technologies in animal agriculture with a view of increasing smallholder farmer's level of production. Gender-blindness in utilizing women's indigenous knowledge in animal agriculture is partly the result of a paternalistic bias, but also of the attitudes of women themselves, who may have been conditioned by their culture and society to undervalue the worth of the work they do and indigenous knowledge information which they possess. In smallholder animal agriculture systems, women provide labour for the various tasks related to livestock but may or may not control the process of decision-making, particularly over the disposal of animals and animal products. Similarly, women may be involved in production, but may or may not own the means of production hence their indigenous knowledge related to these issues will never be utilized. It is imperative to consider enhancement and exploitation of specific indigenous knowledge base by building on the knowledge itself and blending it, where required, with appropriate technologies animal agriculture. It is sad to mention that indigenous knowledge in animal agriculture and its knowledge base - is maintained mainly through oral tradition in families, thus posing a risk of its loss. Different communities are endowed with vast, readily available indigenous knowledge in animal agriculture, with proven efficacies and yet most of this knowledge is not well documented. It is believed that indigenous knowledge in animal agriculture becomes useful due to the fact that farmers lack access to the conventional livestock management skills and financial resources to afford modern technologies. There is need for policy makers to draw some lessons from and incorporate indigenous knowledge in animal agriculture in their quest for sustainable animal agriculture. This helped to guarantee the participation of women and use of indigenous knowledge by smallholder livestock resource poor farmers in animal agriculture, which in turn increased the economic return from livestock production. In most cases policies are not sensitive to gendered indigenous knowledge, hence this gender blindness and negligence for indigenous knowledge values has compromised the contribution of women in animal agriculture. Suggestions have been put forward for consideration to rethink development of animal agriculture with local indigenous knowledge being built into the livestock production practices. Harmonizing conventional scientific animal agriculture technologies and indigenous knowledge, has to be taken up with adequate caution. There is a need to identify and incorporate the good indigenous knowledge assets that already exist in local communities, and at the same time there is need to adopt and benefit from the advances that current science offers us. However, development agent should be aware that indigenous knowledge can be difficult to define and identify, since in many cases it emerges more as a way of life rather than a set of specific initiatives or tools. Communities should developed local practices to cope with certain conditions over time, such as protection of grazing lands, incidence of new diseases and parasites for livestock and inadequate feed resources due to climatic variability. The phenomenon of indigenous knowledge, though recognized,

needs to be incorporated more significantly in the animal agriculture processes. An understanding of women farmers' role in animal agriculture, its importance and their constraints is a prerequisite to tapping their indigenous knowledge to improve productivity and socio-economic development through animal agriculture in Sub Saharan Africa.

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