

Environmental Security, Indigenous Knowledge Systems and Implications for Food Security in South Africa

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ABSTRACT The cases from KwaZulu-Natal Province, South Africa show linkages between environmental security and indigenous knowledge systems for sustainable food security. Both secondary and primary sources are used. The paper advances the argument that the role of cultural specific environmental ethics in the province in research and development policy tends to be neglected. It recommends that in order to promote environmental security for sustainable food security, indigenous knowledge systems should be included in provincial environmental discourses and policy developments. This requires a paradigm shift in which the role of indigenous knowledge systems takes a central stage in the sustainable development policy strategies of the province and the country at large. This is based on the recognition that a large proportion of the people in the province and country, especially women in the marginalized communities, depend on these knowledge systems for livelihood in food security and natural resource management including biodiversity conservation.

INTRODUCTION

The paper argues that role of culture tends to be neglected in research, policy and academic environmental discourse. This is in spite of the central role environment plays in human lives. This paper interrogates the symbiotic relationship between environmental security and indigenous knowledge systems and their contribution to sustainable community livelihood and development in KwaZulu-Natal Province (KZN), South Africa. This is based on the increasing realization that South Africa and KwaZulu-Natal province in particular is facing crucial environmental related challenges which include water shortages and rising greenhouse gas emissions which impact on community food security.

The paper notes that South Africa has been a key player and participant in the United Nations Conference on Sustainable Development (UNCSD), also known as Rio+20. This was the third international conference on sustainable development aimed at reconciling the economic and environmental goals of the global community. South Africa also participated in the 1992 Earth Summit/United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro and the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg

(South Africa). This poses the question on the scope and extent to which South Africa's participation and involvement in these sustainable development dialogues, being a signatory to these environmental conventions have enabled its developmental policies to take into account the challenges associated with environmental insecurity (The Human Development Report of the United Nations Development Programme 2004).

Kamara (2013) states that the environmental security challenges faced by South Africa are either a result of environmental mismanagement, or inequality, or both. There is also the tendency among policy makers, environmentalists and other stakeholders to ignore community-based knowledge, value systems and experiences of local communities. These have been used for centuries to interact sustainably with their immediate environments. In this discussion environment security looks at the double relationship between the welfare of the environment including natural resources and human livelihood. Environmental security also looks at the impact of human conflict and international relations on the environment. It is on the basis of this latter consideration that the concept of environmental security has taken on new meaning in the twenty-first century because sustainability and natural resource protection are becoming essen-

tial elements of national security and foreign policy (World Bank 2009).

Muller (2008) on the other hand acknowledges that there is currently increasing research on sustainable development focusing on environmental security, climate change adaptation and the role of indigenous knowledge systems. This is shown by the inclusion for the first time of a section on indigenous knowledge in the Inter-Governmental Panel on Climate Change (IPCC) Fifth Assessment Report (UNFCCC 2013). In the context of this discussion, Indigenous Knowledge Systems (IKS) refers to bodies of knowledge, skills and beliefs produced locally and traditionally transmitted orally from one generation to the next. They are also known as community knowledge systems (Nyong et al. 2007; Mathews 2013).

KwaZulu-Natal Province is predominantly rural, which is vulnerable to the adverse effects of climate change. It is characterized by a low-lying coastal area, arid and semi-arid areas liable to accelerated forest degradation, areas prone to natural disasters, areas liable to drought, fragile ecosystems, including mountainous ecosystems; and economy highly dependent on income generated from the production, processing of exports and associated energy intensive products. A large proportion of the people in the province, especially rural women, depend on their IKS for environmental and food security (Cathbert 2003).

METHODOLOGY

The study uses cases from KZN Province to interrogate the issues related to environmental security, indigenous knowledge systems and implications for food security in South Africa. A combination of both secondary and primary sources were employed. The secondary sources used were readily available for making conclusions. In the context of this study they included past research, policy reports and internet sources. The collection of primary data followed a participatory and qualitative approach in which interactive research methods such as in-depth interviews, focus groups discussions, participatory observations were used to interact with the knowledge holders and practitioners in study communities.

This took into consideration the community-based nature of IKS. Community leaders from

six of the 11 district municipalities were consulted on the identification of at least 5 community knowledge-holders who had a wide knowledge and experience on issues related to the research problem. Interactive research methods such as focus group discussions and in-depth interviews were conducted. A purposive sampling procedure was deployed in which decisions to select the individuals to be included in the sample were based on the specialist knowledge of the research issue (Oliver 2006). The qualitative data which were collected through document analysis, interviews and focus group discussions, were categorized and analysed through content analysis. Content analysis is a systematic and replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding (Berelson 1992).

RESULTS AND DISCUSSION

Indigenous Knowledge Systems and Environmental Security

African societies have for centuries used knowledge of their local environments to sustain themselves and to maintain their cultural identities. The role of these African indigenous knowledge systems has recently been recognized by the western scientific community as a valuable source of environmental and social information (Akhtar 2002; Nyong et al. 2007). This linkage between cultural and natural environment has been expressed in various African philosophies across the continent. One of these philosophies in Southern Africa is *Ubuntu*. The philosophy offers human beings an understanding of themselves in relation to the world and all other forms of God's creation (Flippin Jr 2014).

"*Ubuntu*" has a value system with a universal applicability which emphasizes the fact that to be human involves valuing the good of the community and other forms of creation, above self-interest. It includes striving to help others in the spirit of service, to show respect to others and to be honest and trustworthy. It regards humanity as an integral part of the eco-systems that lead to a communal responsibility to sustain life. *Ubuntu* emphasizes the sharing and conservation of our natural resources on the principle of equity among and between generations. As an African worldview, "*Ubuntu*" views

environmental resources (land, water, birds, insects, animals and plants) not only as production factors with economic or food security significance, but also as having cultural significance in their natural context (Mubangizi and Kaya 2014). For instance, certain natural resources such water, mountains, forests, caves, rivers, etc. have a special spiritual meanings and hence are used as special places for rituals and sacrifices. Some of these locations have high biodiversity which are well conserved and protected by the community. For example, among the Zulu people of KZN Province and other African traditional communities, ancestral spirits, shrines, ritual crops and animals, food items and cash crops are all inter-related.

The Millennium Ecosystem Assessment (2005) has been identified as the basic framework for understanding the relationship between environment and security. It looks at all the functions of ecosystems and the services they deliver to people and nature. For instance, it demonstrates the way the degradation of ecosystem undermines food production and the availability of clean water, threatening human health, livelihoods and, ultimately, societal stability (Kilahama 2004). This is elaborated by Cathbert (2003) who states that ecosystems provide people with a diverse range of food sources that support entire agricultural systems. However, the value of food security and sustainable livelihoods is often a function of environmental security which tends to be compromised by human negligence. It is on the basis of this consideration that Hunn (2003) argues that it is important to examine the effectiveness of environmental security and determine ways in which it can be improved and how its standards can be strengthened for sustainable development (World Bank 2004).

IK is an important asset of the poor and other marginalized social groups such as African rural women. They use this community-based knowledge to gain control of their own lives hence, its preservation is important to ensure livelihood and environmental security (Billie 2004; Brouwer 2006; Stabinsky 2007). The paper has the opinion that the integrated nature of IKS is important in environmental and food security discourse because it involves collective wisdom to mitigate associated challenges (Compton 2001; Clarke 1994).

Research shows that although KZN province is endowed with rich biodiversity and associated IKS, the province is facing critical environmental and human resource challenges which affect its food security (McCall 2004). These include lack of water, soil erosion, deforestation and drought, dreadful diseases, unemployment and poverty (Atampugre 2001; Larson 2008). The following section provides a case study in which IK and resources are used to ensure food security for climate change adaptation. The paper argues that the suitability of the environment to provide all life support systems and the materials for fulfilling all developmental aspirations of man and animals is dependent on the stability of the climate which is undergoing constant changes. McCall (2004) shows that the effect of these changes is posing a threat to food security in most parts of KZN province, especially in the drought stricken districts such as UMkhanyakude and Zululand.

The following section provides cases in which indigenous knowledge and resources are used to ensure food security and climate change adaptation.

The Use of Zulu Chickens and Traditional Leafy Vegetables for Food Security and Climate Change Adaptation

KwaZulu-Natal Province has the second largest population (>10 Million people) in South Africa after Gauteng province. However, more than a third of the provincial population live below the US\$2 a day poverty line; and two-fifths of the workforce are unemployed (FAO 2010). Environmentally, the province is characterized by diverse climatic conditions due to large variation in topographical features, such as the altitude that ranges from sea level at the shoreline to over 3000 m at the western border along the Drakensberg Mountains. Rainfall ranges from 500 mm to over 1500 mm per annum (Vogel 2006). The coastal region is associated with humid and warmer temperatures. The province consists of 11 district municipalities with diverse ecological zones, farming systems and socio-economic conditions. The study households visited in the 6 district municipalities depended on subsistence farming in an arid environment.

Department of Agriculture in collaboration with the Government of Flanders initiated a five-year "Empowerment for Food Security Program"

(EFSP) project. The objective was to improve the livelihoods of poor households in the province, especially their food security, nutrition, employment opportunities and income generation. The main target (beneficiary) groups were farmers, women and people living with HIV/AIDS, especially people facing and experiencing food insecurity (Larson 2008). The project aimed at training communities to produce their own foods using local knowledge and resource-based projects. One of these projects was the production of village chickens. Low-input village chicken production is very popular among resource-limited rural communities in the province. These chickens play various socio-economic and cultural functions in traditional religious and other customs in various cultural groups. They serve as gift payments, income sources and source of animal protein (World Bank 2009; United Nations Development Programme (UNDP) 2010).

Yoder (2007) and Baines (2008) provide environmentally related advantages of the village chickens for poor households: (i) considerable minimal investment on inputs as most of the inputs are generated in the homestead. Indigenous chickens can be fed on cheap, locally available feeds; (ii) labour is inexpensive as it can be drawn from the family; (iii) initial investment is less than that required to keep commercial breeds; (iv) their meat and eggs are considered tastier and preferred by some consumers compared to those sold by commercial producers (broilers); (v) markets are locally available and there are limited transport costs involved; (vi) the chicken droppings are rich in nutrients and can therefore be used for compost making, garden manure or as feed for livestock; (vii) in the context of climate change adaptation, indigenous chickens adapt well to different environments and are more tolerant to harsh conditions, including diseases compared to commercial breeds. They can survive on limited feed resources that fluctuate in quality according to seasons.

Women dominated the production of the village chickens. However, a large proportion (over fifty percent) of the women involved in indigenous chicken farming were 50 years or older. Age is one of the factors that can affect the sustainability of indigenous chickens farming as older farmers were less capable of carrying out physical activities compared to the younger ones and most of them were reluctant to take

risks with new technologies (Clarke 1994). Younger farmers expressed more willingness to interface indigenous and modern technologies to improve production. This is due to the observation that as farmers get older, they often become more reluctant to accept risk (Vogel 2006).

In South Africa and KZN Province in particular, traditional leafy vegetables (TLVs) have been used for centuries by the Zulu people who rely on wild plants for endurance. Most of TLV's are weedy, pioneer species and therefore disturbed habitats associated with agricultural and agropastoral land promote growth of a great diversity of these species (Badenhorst 2008). For instance, weedy TLV's such as *Amaranthus hybridus*, *Momordica foetida* and *Colocasia esculenta* are collected from agricultural fields and sold at road markets by rural women in the province. Epenhuijsen (2004) states that although a lot of research has been done on South African TLVs, there is still a lot of indigenous knowledge which needs to be documented regarding use of TLVs in different cultural communities.

In KwaZulu-Natal Province, the extent of cultivation, use and distribution including marketing of TLVs differ from one district to another and among the various cultural communities in both rural and urban areas. Ventura (2008) shows that the local communities in Umkhanyakude district used more wild species than those from the other districts in his study, probably because the district lies in Maputaland, an area renowned for its rich biodiversity. This provides the local communities with a wider than normal variety of species to choose from. Apart from the popular species often harvested, there is a difference in TLV's collected from the wild by the different communities (Kisanga 2005). This shows that the natural environment and the richness of biodiversity of an area shapes and influences the selection of species in specific communities.

The above cases have policy implications. This is based on the argument that in spite of the increasing realization by researchers, policy makers, development agencies and some environmentalists on the significance of IKS for sustainable environmental management and food security, very limited efforts are initiated to incorporate IKS into policy. Most of the poorest rural communities still depend on their IKS for livelihood and environmental management.

CONCLUSION

The paper interrogated the linkages between environmental security and indigenous knowledge systems for sustainable food security in South Africa, with special reference to KZN province. The paper argues that African societies have for centuries used knowledge of their local environments to sustain themselves and to maintain their cultural identities. This linkage between cultural and natural environment has been expressed in various African philosophies across the continent. One of these philosophies in Southern Africa is *Ubuntu* which expresses the symbiotic relationship between human beings and other forms of creation. The importance of preserving the ecosystems was emphasized because they provide people and communities with a diverse range of food sources. Indigenous knowledge is an important asset of the poor and other marginalized social groups because as it is used to gain control of their own lives hence, its preservation is important not only to ensure livelihood but ensuring environmental security. The integrated nature of IK is important in environmental and food security because it involves collective wisdom to mitigate associated environmental security challenges. The paper further argues that although KZN province is endowed with rich biodiversity and associated IKS, the province is facing critical environmental and human resource challenges which affect its food security, especially in the drought stricken districts of UMkhanyakude and Zululand. Examples are provided of best practices of food security initiatives which promote IKS and environmental security. These include the production of village chickens and indigenous leafy vegetables. The main producers being women as custodians of IKS and biodiversity.

The paper also showed that age is a factor that can affect the sustainability of the linkages between environmental security and IKS for sustainable food security. Most of the knowledge is held by older generations who are less capable of carrying out physical activities, might die with the knowledge and not prepared to take risks with new technologies. However, younger farmers expressed willingness to interface indigenous and modern technologies to improve production and protect the environment.

RECOMMENDATIONS

The paper recommends that in order to promote environmental security for food security,

IKS should be included in environmental policy development and educational curriculum. Taking into consideration of the fact that women are the main custodians of IK and environmental security for food security, the designing of environmental and food security training programmes should put emphasis on women by incorporating their community-based knowledge systems and experiences. The introduction of new environmental technologies should be gender sensitive by looking at their impact on the status of women in as the main custodians of IKS and household and community food security.

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