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An Exploration of the Value of Indigenous Knowledge Adaptation Strategies in Ensuring Food Security and Livelihoods in Southern Zimbabwe

By Nkululeko Joshua Ndiweni & Christopher Ndlovu
Lupane State University, Zimbabwe

Abstract- Extreme weather events such as droughts and El Nino induced events have become more frequent and intense in southern Zimbabwe leading to food and livelihood insecurity for most households. Disadvantaged groups, such as the poor, widowed and orphaned, are more vulnerable to these events which are a result of climate variability and change. This is a result of the absence, weak and maladaptation practices to climate variability and change in most cases. High vulnerability has threatened food and livelihood security as evidenced by hunger, outbreak of diseases and loss of livestock. Maladaptation tends to be a result of the imposition of foreign adaptation strategies that do not augur well with specific environments. Conventional adaptation methods such as dam construction, borehole drilling and irrigation schemes are less robust due to the effects of climate change that has led to the shrinking of water bodies and lowering of the water table. Pre-colonial communities knew and managed their environments very well through observations and direct experience with their natural environments and this led to the development of indigenous knowledge systems which enabled people to get the most out of their environments. Indigenous knowledge adaptation strategies tend to ensure sustainable food and livelihood security because they are 'culture-fit' and accessible to all people. It is recommended that communities in southern Zimbabwe should synergise ethno-science and techno-science adaptation strategies in order to build a robust resilience against climate variability and change.

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AN EXPLORATION OF THE VALUE OF INDIGENOUS KNOWLEDGEADAPTATION STRATEGIES IN ENSURING FOOD SECURITY AND LIVELIHOODS IN SOUTHERN ZIMBABWE

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An Exploration of the Value of Indigenous Knowledge Adaptation Strategies in Ensuring Food Security and Livelihoods in Southern Zimbabwe

Nkululeko Joshua Ndiweni [α] & Christopher Ndlovu [σ]

Abstract- Extreme weather events such as droughts and El Nino induced events have become more frequent and intense in southern Zimbabwe leading to food and livelihood insecurity for most households. Disadvantaged groups, such as the poor, widowed and orphaned, are more vulnerable to these events which are a result of climate variability and change. This is a result of the absence, weak and maladaptation practices to climate variability and change in most cases. High vulnerability has threatened food and livelihood security as evidenced by hunger, outbreak of diseases and loss of livestock. Maladaptation tends to be a result of the imposition of foreign adaptation strategies that do not augur well with specific environments. Conventional adaptation methods such as dam construction, borehole drilling and irrigation schemes are less robust due to the effects of climate change that has led to the shrinking of water bodies and lowering of the water table. Pre-colonial communities knew and managed their environments very well through observations and direct experience with their natural environments and this led to the development of indigenous knowledge systems which enabled people to get the most out of their environments. Indigenous knowledge adaptation strategies tend to ensure sustainable food and livelihood security because they are 'culture-fit' and accessible to all people. It is recommended that communities in southern Zimbabwe should synergise ethno-science and techno-science adaptation strategies in order to build a robust resilience against climate variability and change.

I. Introduction

Successive droughts in southern Africa have threatened food and livelihood security for most rural households. Agricultural production that determines food security in Africa is placed under considerable stress by climate change (FAO, 2007). Southern Zimbabwe's vulnerability is very high because most of the households depend upon rain-fed agriculture. The general consequences tend to be adverse for the poor and the marginalized that do not have the means to withstand shocks and changes (Boko et al, 2007).

Author α: Department of Geography and Population Studies Lupane State University. e-mail: njndiweni@gmail.com
Author σ: Department of Educational Foundations Lupane State University. e-mail: chrisndlovu47@gmail.com

Incorporating indigenous knowledge systems can add value to the development of sustainable climate change adaptation strategies that are rich in local content, and planned in conjunction with local people (Nyong et al, 2007). Since the poor are considered the most vulnerable to climate change impacts, it is often believed that financial capital is the most important indicator of adaptive capacity. Building on local knowledge is the first step to mobilize such capital (Phillips and Titilola, 1995). Capacity building should emphasize the need to build on what exists, to utilize and strengthen existing capacities (Nyong et al, 2007). Indigenous knowledge systems play a significant role in the sum total of what exists in a local community. It is against this background that indigenous coping strategies need to be encouraged so as to increase a community's resilience to drought. The purpose of this paper is to characterize and explore the value of indigenous knowledge adaptation strategies in ensuring food security and livelihoods in Southern Zimbabwe.

II. Indigenous Knowledge Systems

Briggs (2005) explains indigenous knowledge as the sum total of the knowledge and skills which a given community possess and enable it to get the most out of its environment. Indigenous knowledge is specific to communities. In most cases indigenous knowledge exists only in theory, people speak about it but do not have any practical experience of it. Briggs (2005) asserts that traditional practices have not been used and people have become alienated from their resources since colonial days, so it is very difficult to translate the stories into action. Communities should fully embrace this knowledge because it sustains the community and its culture and maintains genetic resources necessary for the continued survival of the community. Indigenous knowledge systems are forms of knowledge that have originated locally and naturally (Altieri, 1995). They are used for the benefit of specific communities. According to Nyong et al (2007) indigenous knowledge is rarely taken into consideration in the design and implementation of modern adaptation strategies. Any meaningful attempt at implementing adaptation

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strategies to reduce the vulnerability of the people in southern Zimbabwe to the impacts of future climate change should start by examining how the communities in the region had successfully reduced their vulnerabilities and coped with past impacts.

III. Indigenous Knowledge Adaptation Strategies

Adaptation is defined by the Intergovernmental Panel on Climate Change (IPCC) as an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (Parry et al, 2007). This implies that natural or human systems are adjusted in order to minimize the harm that might be caused by extreme weather events, for example. Adaptation methods are those strategies that enable the individual or the community to cope with or adjust to the impacts of the climate in the local areas (Nyong et al, 2007). Strategies that can be adopted in southern Zimbabwe include indigenous weather forecasting and farming methods. Fujikura and Kawanishi (2011) argued that since drought is localized and specific, it requires local, ecological particular responses. Conventional methods such as dam construction and borehole drilling have been affected by climate change in that; it has led to the shrinking of water bodies and lowering of the water table. Mapara (2009) argues that, western knowledge systems that have been forced upon the world are not the only important knowledge systems but are representative of one side of humanity.

a) Indigenous Weather Forecasting Methods To Improve Drought Management

Indigenous knowledge systems have been applied in weather forecasting by various cultural groups of southern Zimbabwe. The Ndebele and Shona people like the Tangwena people (Mapara, 2009) have through experience based on observation of trees, animals, insects, terrestrial objects and bird behaviour learnt the art of indigenous weather forecasting. Amongst the Shona people fruit trees like muchakata (parinari curatellifolia), gan'acha (lannea discolor) and mushuku (uapaca kirkiana) are frequently used to predict the eminence of the rain season and the quantities of rainfall in any given agricultural season (Muguti and Maposa, 2012). The Ndebele people also rely on wild fruits like black-berries umtshwankela, (Vitex mombasa) umkhuna (Parinari curatellifolia) and umthunduluka (Ximenia caffra). These cultures have observed that if there is an abundance of these wild fruits towards the rain season then below normal rainfall would be experienced. Due to migration and inter-marriages it is now difficult to really single out indigenous methods that are specific to given cultures.

Birds are also used for weather forecasting. Mapara (2009) states that if people hear the sounds of insingizi (bucorvus leadbeateri) and inkanku (Clamator jacobinus) then the rains will fall in some few hours time. When chickens feed when it is drizzling it indicates that the drizzle will be of long duration for about two or three days which increases the amount of soil moisture. Muguti and Maposa (2012) stated that animals like rock rabbit, when it squeaks in ways that are unusually, it heralds the imminence of rainfall in a particular season. This belief is very common in all cultures of southern Zimbabwe.

The emergence of insects like amatheza (ants), when it starts to collect a lot of grass for storage underground it indicates that the rain season is imminent. Chiondegwa in Muguti and Maposa (2012) states that the behaviour of these insects is an indication that the growing season would be good so much that people are expected to work hard just like the amatheza insects. People also make use of inyeza (cicadas) to forecast the onset of the rains. When these insects (cicadas) start to 'sing' then people do their dry planting because the rains would be coming two to three weeks time. The appearance of locusts in large numbers has been used to be predict a drought year.

Terrestrial objects are also used in indigenous weather forecasting. When there is a cloud like-structure or ring around the moon (umkhumbi) that is indicative of a good rainfall season. The larger the ring, the more rainfall is received that season and the reverse is also true (Muguti and Maposa, 2012).

These are some of the most common indigenous weather forecasting methods that people rely on for their drought management efforts. In times where there would be many wild fruits, such as uapaca kirkiana and parinari curatelli-folia, these have been gathered and stored as supplementary feed for the drought season.

b) Adoption of Indigenous Farming Methods

Indigenous knowledge farming systems encompass stover storage and the use of night kraals for organic manure, intercropping, zero-tillage, fallow system and transhumant movement. These indigenous knowledge farming systems are cost-effective and environmentally friendly compared to exotic technologies. They can be practiced in the communal areas since they rely on locally available resources.

i. *Stover storage and the use of night kraals*

One of the adaptation strategies used in southern Zimbabwe is the storage of fodder. The fodder storage is put in kraals where animals are fed, normally from August to October. Animals are fed at night after spending the day in the pastures. It is used as supplementary feed. The fruits of indigenous trees such as amawohlo, ihababaha and acacia are collected and are also used as supplementary feed for the animals.

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The remains of the feeds add to the amount of manure which is used to improve soil fertility.

ii. *Intercropping*

Intercropping is the most practiced indigenous farming system. It has proven to be a better agricultural practice when compared to monoculture in the sense that it helps to maintain soil moisture and reduce soil erosion caused by run-off water because the soil is under permanent cover (Mapara, 2009). According to Mapara (2009) the colonialists brought with them the practice of monoculture whereby one crop is planted in one field. Intercropping is also used as a method of weed control. Most of the farmers intercrop maize with groundnuts; maize with cowpeas and maize with beans. In most cases maize and sorghum are intercropped with legumes. When several crops are grown on a piece of land, farmers will be assured of a harvest. Panda (2007) points out that the main objective of inter-cropping is to lessen the risk of total crop failure. It leads to high total yields due to maximum water and weed control thereby assuring farmers with food security.

iii. *Zero tillage*

Moisture loss is accelerated by high temperatures leading to low agricultural output. Conservation farming such as zero tillage should be adopted for the optimum use of moisture. Smith (2006) defines zero tillage as a method of planting where the soil is not disturbed and the seed is drilled directly into the mulch or stubble of the previous crop. It leads to the conservation of soil moisture because of the availability of mulch.

iv. *Indigenous methods of cattle management*

Climate variability and change have led to the loss of pastures and drying up of watering holes for livestock. Large numbers of livestock, especially cattle, die each year due to food and water shortages. Indigenous cattle management strategies such as destocking and transhumance can assist farmers to reduce the loss of livestock. Destocking in the form of loaning (ukusisa) to relatives and friends in better areas assists farmers to control overgrazing. Animals will not exceed the carrying capacity of the land. Transhumant movement is also practiced to a larger extent in southern Zimbabwe. Animals are moved to areas with better pastures during the winter season. If long distances are involved, farmers tend to hire trucks to transport cattle from one area to another. This has reduced the mortality of livestock to a greater extent. The conventional method of feed-lots is effective but cost prohibitive for the rural poor. Most people prefer the methods of loaning cattle and transhumance.

IV. Conclusion

This paper concludes that southern Zimbabwean communities like other communities in sub-Saharan Africa and the world at large are very rich in indigenous knowledge systems that are embedded in the cultured ways that should be tapped to improve food and livelihood security. While the conventional survival strategies have been promoted in most cases they tend to be cost prohibitive, hence are not readily applicable to the rural communities, making the indigenous knowledge adaptation strategies the only option to be used to minimize the negative impacts of climate variability and change in southern Zimbabwe.

V. Recommendations

The paper strongly recommends the vigorous promotion of the indigenous knowledge systems to the communities found in southern Zimbabwe. Traditional structures should be used in conducted workshops that would promote the adoption of various indigenous adaptation strategies. Community members who are experts in indigenous intervention strategies should be identified and encouraged to share their experiences with the other community members. Government institutions and organizations such as Agritex and schools should also be incorporated in the promotion of the indigenous adaptation strategies. Agritex officers and traditional institutions should be encouraged to assist in the awareness campaigns of indigenous adaptation strategies, while the schools should be encouraged to include indigenous knowledge systems in their curricula. The integration of indigenous adaptation strategies and the conventional strategies is to be encouraged if the battle against climate variability and change is to be won in the areas of southern Zimbabwe.

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