

THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

The Challenge Of Global Environmental Change On Grassroots Farmers: Prioritizing Knowledge Dissemination In Africa

Bessie F. Madziwa

Director Of Zvishavane Water Project, Zimbabwe

Christopher M. Mabeza

Phd Researcher, Department Of Social Anthropology

University Of Cape Town, South Africa

Munyaradzi Mawere

Associate Professor, Department Of Social Anthropology

Universidade Pedagogica, Mozambique

Abstract:

The question of a changing global climatic environment is highly momentous and has sustained discussions of epic proportions in environmental sciences and geographical studies in Africa and beyond. However, more often than not, policy makers and epistemic communities do not discuss issues of a global climatic environmental change with grassroots farmers who in most cases are the most affected. This paper examines the impacts of global environmental change on grassroots farmers in Africa and in particular southern semi-arid areas of Zimbabwe. The thesis of the paper is that there is need to build initiatives to disseminate information on global environmental change to grassroots farmers in order to ensure food security even in the most affected areas. The paper also synthesizes disparate literature on food systems, food security and global environmental change, and argues for the bridging of indigenous knowledge systems and expert science perspectives in dealing with global environmental change especially its impacts.

Key words: *Global environmental change, grassroots farmers, vulnerability, knowledge*

1. Introduction

Global environmental and socio-economic changes normally happen simultaneously and with rapid and complex processes involved. This makes the impacts of both global environmental and socio-economic change drastic and their consequences difficult to deal with. Global environmental change such as climate change, for example, has impacted negatively on ecosystems thereby making water and food security especially in already semi-arid area and among grassroots farmers more uncertain than ever. This has caused most forecasting scenarios suggesting greater vulnerability to damage, reduced ecosystem services, and undermined resilience to global environmental change especially among grassroots farmers. Building resilience to climate change and other shocks, for example, needs to be mainstreamed into agricultural planning to ensure food security. This is especially important for vulnerable populations with low adaptive capacities such as grassroots farmers in sub-Saharan Africa. The majority of the population in sub-Saharan Africa make their living from rain-fed agriculture (FAO, 1995), and largely depend on small-scale subsistence agriculture for their livelihood security (Rockström, 2000).

In many parts of the continent, the overall access of people to food largely depends on the work of a farmer. Yet, the research from which this paper is developed has revealed that the impact of climate change in the form of erratic rainfall, frequent dry spells, scarcity of arable land, and irrigation expansion limitations have contributed to a sharp decline in productivity causing food scarcity in southern semi-arid Zimbabwe. Worse still, there are a myriad of challenges faced by small-scale grassroots farmers. These include, among others, lack of awareness and general understanding of the current climatic changes taking place across the globe; and the technological knowhow of how to protect ecosystems and enhance water productivity of rain fed agriculture in their local community fields for increased harvest. In many rural areas of sub-Saharan Africa, women carry out essential work such as hoeing, planting, weeding and harvesting with simple tools and little outside assistance (World Bank,). If they are empowered with knowledge through awareness raising and advocacy, production trends and harvests may be enhanced. Similarly, if policy makers and epistemic communities who indeed are paragons of ideas allow themselves time to mingle with grassroots farmers disseminating knowledge on global environmental change, the communication gap between the aforementioned players will be filled in and food security enhanced. This is because the role of environmental education is to improve the knowledge and awareness of new possibilities and of risk, in order to reduce its impact (Beck, 1999). Furthermore, education has the potential to improve reflexivity among communities of practice (Wenger, 1998) on some of the dangers

associated with modern unsustainable agricultural practices that are increasing genetic erosion, knowledge loss of 'traditional' farming practices, and food insecurity.

In view of the aforementioned, this paper has its thesis that development policy makers, academics and researchers must become increasingly closer to grassroots farmers and make them aware of the impacts of climate change to caution the problem of food insecurity in Africa. The paper is inspired by many factors inter alia, the spirit of seeing the farming community as an empowerment model of intervention, rural people especially those in semi-arid areas as agents of transformation to adaptation in this era of climate change and increased food insecurity.

2. Research Context And Study Area

The present research though focusing on the challenges of global environmental change on sub-Saharan Africa in general is drawn from surveys and observations carried out in southern semi-arid Zimbabwe. The contextual background of the research therefore has its roots and particular focus on Zimbabwe.

Zimbabwe is a developing land locked country with a total population of about 12.5 million, a significant proportion of the population largely dependent on exploitation of environmental resources for their livelihoods and sustenance. Since the turn of the new millennium, Zimbabwe has experienced a cocktail of problems that were socio-political and economic in nature. These problems have been exacerbated by pronounced increases in temperature, recurrent droughts and unpredictable rainfall patterns, all of which have worsened suffering among the people of Zimbabwe— especially in the rural areas, where the majority of the population resides, and depend on rain-fed agriculture. The reliance of the vast majority of Zimbabweans on rain-fed agriculture, and the sensitivity of agriculture which is one of the major sectors of the economy makes Zimbabwe especially its semi-arid areas particularly susceptible to climate change. In semi-arid Zimbabwe, water is by far a greater constraint than land (FAO, 2005) as such areas sometimes receive less than 100mm per annum. Receiving low rainfall and experiencing high temperatures, semi-arid southern Zimbabwe for example, is in one of the most vulnerable regions to climate variability in the country. This in itself means that the agricultural sector in semi-arid Zimbabwe is quite vulnerable with marginally productive areas probably shifting to non-agricultural use. This is in spite of the fact that Zimbabwe has ratified the UNFCCC, as indeed there is currently no clear national strategy on implementation of its provisions. Zimbabwe currently has no specific policy response to climate change besides fragmented responses implied in a set of sectorial policies, including those relating to environment and natural resources management, water resources management, agriculture and food security, and disaster management.

This observation implies that public awareness, especially as it relates to adaptation, is sorely lacking in Zimbabwe. This has been confirmed by delegates attending a climate change roundtable in April 2009 who noted the absence of a deliberate and focused policy response to climate change in Zimbabwe. The roundtable noted that climate change is currently not an issue in the parliament of Zimbabwe, and is therefore not adequately factored into the country's development plans (Report of a Climate Change Awareness and Dialogue Workshop for Parliamentarians, 2009). Zimbabwe's Second National Communication to the United Nations Framework Convention on Climate Change states that there are "low levels of awareness" especially among grassroots farmers (Second National Communication 2012 p86). At least a conscious and deliberate effort to mainstream climate change adaptation has been defined, and with the effects of climate change taking a toll on farmers this needs to be applauded. However it is hoped that the authorities will move with speed to implement the recommendations of the Second National Communication. While initiatives to adaptation is implied through the efforts of various government ministries and departments to ensure that people can adapt to environmental changes and/or climate change, lack of capacity to identify links between climate change and various social and economic sectors means that climate risks are not being adequately mainstreamed in national policy, budgets, government and other organizational programs and plans (Chaguta, 2010). Also, Zimbabwe's demographic data show that more women than men live in the rural areas (sex ratio 1.16), (see Frost, 2001), where livelihoods are closely linked with the exploitation and integrity of the threatened natural resources base.

It should be emphasized that while this research focuses on the challenges of global environmental changes in sub-Saharan Africa, it particularly explores the challenges in southern semi-arid Zimbabwe. The study covered two main agro-ecological zones, region 4 and 5, in Southern Zimbabwe. Random sampling of farmers in agro-ecological zones 4 and 5 was done for 75 households and 2 focus group discussions were held. A total of nine key informant interviews were also conducted with the various government departments and civil society groups. Primary data collection was done using individual household and focus group interviews and secondary data was collected from existing climate science information and targeted government ministries working with communities to reduce the adverse impacts of climate change in Zimbabwe. Below is a map which shows the location of the study area in Zimbabwe.

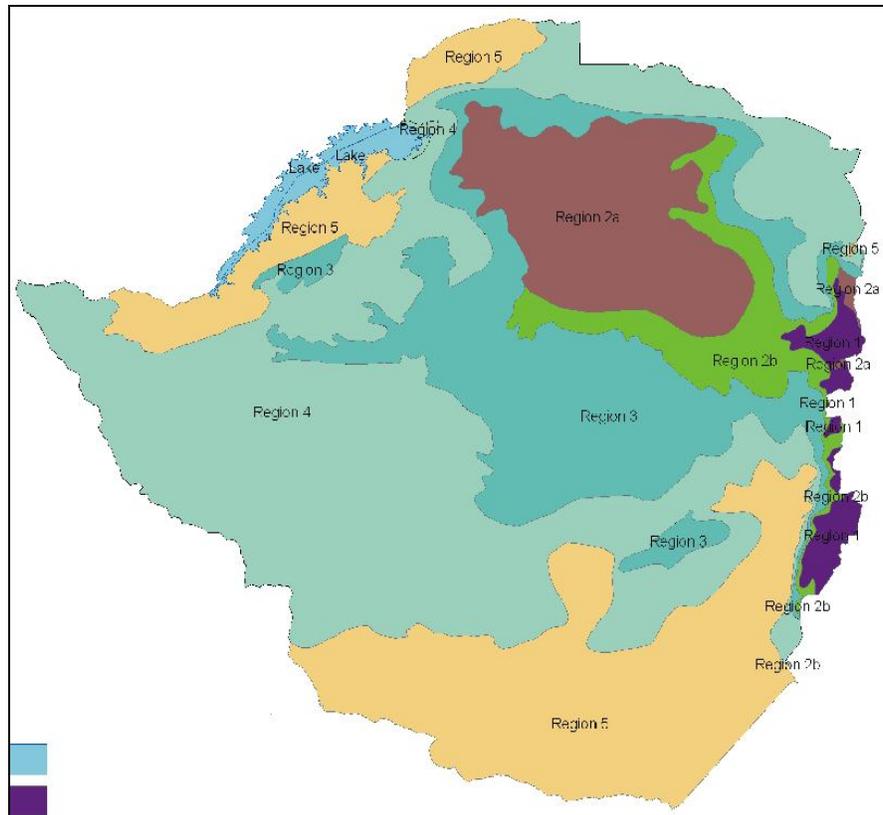


Figure 1: Agro-Ecological Zones In Zimbabwe

Key to Agro-ecological zones in Zimbabwe

AA- Region1
AB- Region2a
AC- Region2b
AD- Region3
AE- Region4
AF- Region5

3.Methodological Issues

The present research is qualitative in so far as the researchers undertook interviews, observations and focus group discussions with some farmers in southern semi-arid Zimbabwe. These were meant to understand, interpret or describe systematically the attitudes, impacts, and the challenges people in southern Zimbabwe are facing as a result of global environmental change. In this view, Participatory Rural Appraisal (PRA) techniques were used in conducting this research. PRA is normally used to describe a growing family of approaches and methods that enable local people to share, enhance and analyze their knowledge of life and conditions, to plan and to act (Conway, 1987; Mascarenhas et al., 1991) in with the situations they are facing. In this case, practical and theoretical factors shaping the experiences of the farmers such as recurrent drought conditions, availability of support services for farmers, and economic conditions were studied. The principal question for the present research was centered on how the farming communities at grassroots levels in developing communities can best manage their ecosystems and of course improve their crop productivity in the face of climate change impacts.

To cover all factors that influence learning interactions and choices to adaptation to global environmental changes among grassroots farming communities in southern Zimbabwe, the study adopted a framework below by Pesanayi(2009).

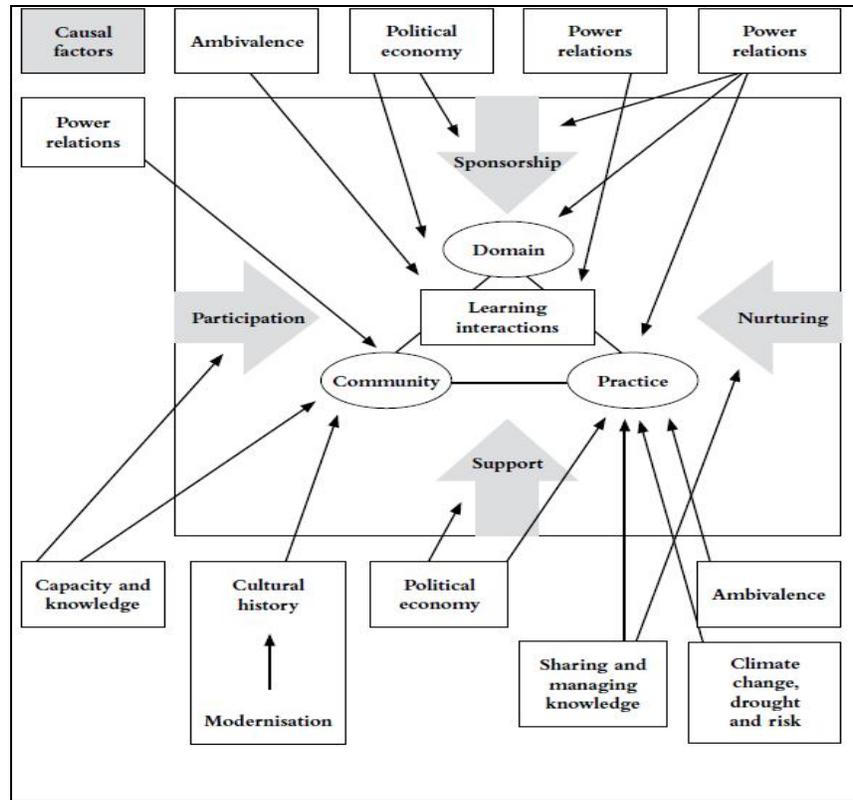


Figure 2: Showing How Underlying Structures And Causal Mechanisms Influence Learning Interactions And Choices In Communities Of Practice

The framework above helped us as researchers to get a grasp of the challenges that farming communities in southern Zimbabwe are facing, and environmental factors and adaptation options that are at their disposal. As can be seen in Figure 2, some form of social interaction and learning always take place in any community at all times. The domain (in this case agricultural activities) is what keeps the community together in spite of the existing ‘forces’ that may inform and affect community sponsorship, participation, support and nurturing. These forces are broadly power relations, political economy, cultural history, ambivalence, capacity and knowledge. This then brings us to our main theory “practice” as shown in Figure 2 that agriculture based community practices are shaped by political economy (policies), sharing and managing knowledge, climate change, drought and risk and ambivalence.

The study began with a one day grassroots farmers/stakeholders workshop which was held to introduce participants to the need for the research and African Climate Change Adaptation Fellowship Programme. The participants included small-scale farmers, local community leadership, civil society and relevant government departments as the policy makers. This workshop initiated and motivated the researchers to critically explore the climate change adaptation and increased food security strategies in semi-arid southern Zimbabwe. A multi-stakeholder research was therefore carried out which indeed was instrumental in coming up with the present research paper.

4.Participant Demographics

The Tables 1 and figure 3 below respectively contain details of the sex and age of people participated during the study:

Sex of respondents					
		Frequency	Percent	Valid Percent	Cumulative Percent
	Male	35	47.9	47.9	47.9
	Female	38	52.0	52.0	100.0
	Total	73	100.0	100.0	

Table : 1

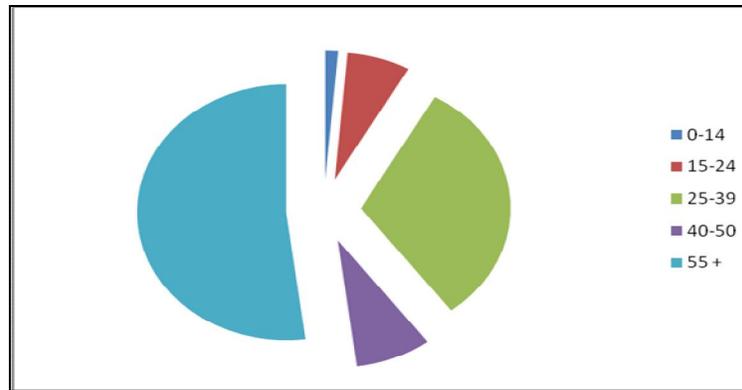


Figure 3: Chart Reflecting Age Of Respondents

5. Brief Description Of The Studied Households' Characteristics

As is shown in Table 1 above, fifty two percent of the farmers interviewed are females and forty eight (approx) percent are males. The reason for having more female participants was that women are believed to be underrepresented in many researches on rural areas yet they constitute the majority in these areas. Also interesting to note is the fact that figure 2 above demonstrates that most of the respondents were above fifty five years. This age range defines the age of those who are left as custodians of field activities and households in the study area, and other such communal areas, considering the social, political and economic meltdown that Zimbabwe experienced since the turn of the new millennium.

6. Research Results And Discussion

This study revealed that grassroots farming communities in developing nations such as Zimbabwe are the most vulnerable and therefore affected by global environmental change. This is because such communities normally lack the means and conditions necessary to adapt to global environment changes as most of them are poor and lack knowledge about the global environmental changes.

It was also revealed that while agricultural development policies and research, awareness raising, agricultural knowledge, climate science, and technology sharing are indeed of paramount importance in equipping the rural farming communities in semi-arid areas to easily adapt to the changing climatic conditions, these alone cannot fully prepare such vulnerable communities. There was considerable evidence from research informants that there is need for combined efforts from all sectors including government political will, academia, non-governmental organizations and researchers to involve themselves in issues of global environmental change. As uttered by one of the research informants during one of the group focus discussions:

While as farmers we have since realized that our rainy seasons are ever dwindling and climatic conditions hotter, there is little we can do as poor farmers. We need assistance from all facets of life including the government, non-governmental organizations, academics and researcher to keep us updated and equipped financially and in terms of knowledge about global environmental changes.

The other important point revealed by this study is that grassroots farming communities especially in semi-arid areas are surely experiencing a myriad of problems ranging from shorter growing seasons, poor crop yields, food shortages, hunger and the spread of disease in a region where almost a third already live in extreme poverty and are women and children. Perhaps, the limitation of a research such as this is that while the problems cited above are a reality in the agro-ecological zones studied, they alone cannot solely be taken as enough evidence to link the current changes and impacts to climate change effects. This therefore calls for further studies in areas such as best agricultural practices, access to health services and economic setup and strength of the rural community to determine fully their ability to adapt to global environmental changes.

7. The Way Forward: Some Recommendations

From the research results discussed above, it was apparent that for grassroot farmer communities to adapt to current climatic changes there is need for stable political economy and implementation of policies, sharing and managing agriculture knowledge science and technology (AKST) especially on what is climate change, drought and risk reduction as well as understanding the relationships and interactions between ecosystem, food security and adaptive capacity of a people. The diagram below (Figure 4) shows the relationships and interactions between ecosystem, food security and adaptive capacity and other forces driving these three.

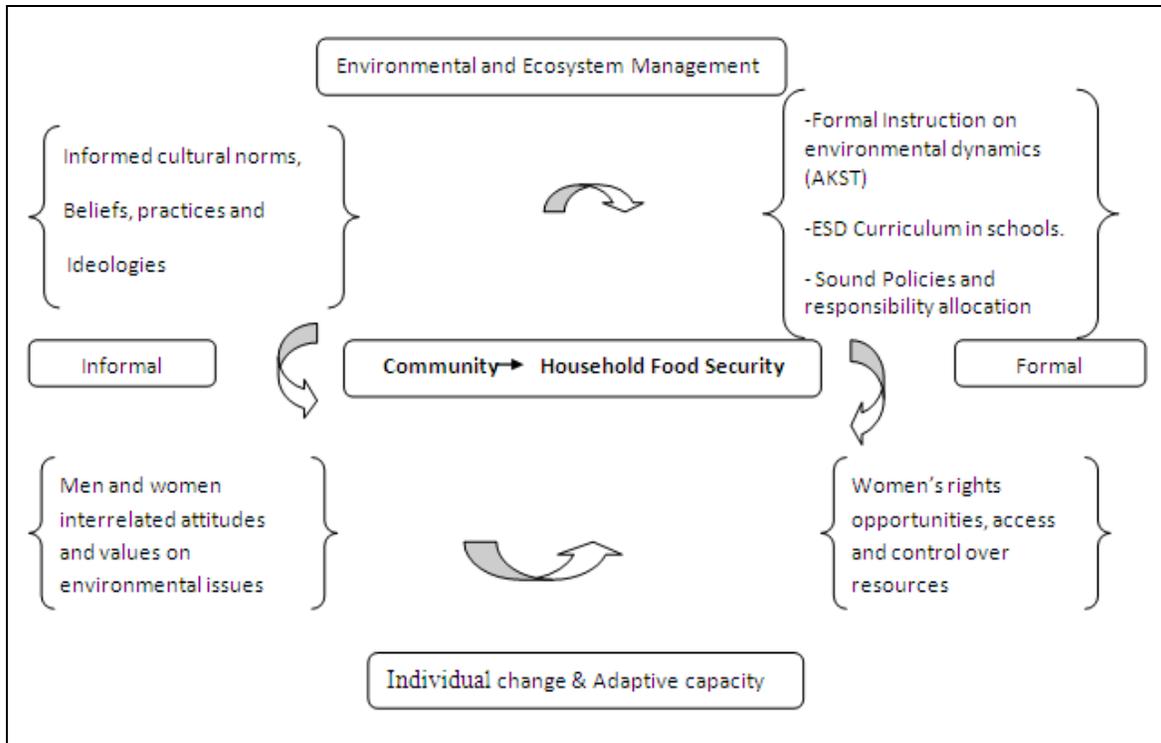


Figure 4: Showing Relationship Between Ecosystem, Food Security And Adaptive Capacity And Other Forces Driving These Three
Source: Adapted From Pesanayi, 2009

As is shown in the diagram above, there is interdependence between ecosystems, adaptive capacity, food security and formal and informal processes/drivers that contributes to individuals' capacity to change and adapt to environmental change impacts. Also, of interest to note from figure 4 and the results from this research is that the ecosystem management should be improved to ensure future generations' food security. Yet to successfully do this, we recommend that ambivalent messages that come through extension services, nongovernmental organizations, academia and researchers should be clarified and situated in context to suit the community concerned. Failure to do this will always have a result that ambivalent messages full of scientific jargon confuse farmers and therefore have to be clarified in terms of community specific context.

Besides, it was observed during this research that food production service ecosystems are seen as a provider of regulatory, supporting and cultural service. This calls for concerted effort to generate an understanding of why and how ecosystems require protection and management through the following but not limited to these suggested ways: i) Formal instruction on agriculture knowledge, science and technology (AKST) ii) Communities' education on sustainable development (ESD) and, iii) Formulation of sound policies that are well implemented at national and local level to protect ecosystems. However, to build resilience to changing climatic conditions and other shocks, we recommend that issues of global environmental change be mainstreamed into educational and agricultural planning at village, district, province and national levels. This is especially important for vulnerable populations with low adaptive capacity: poor women and marginal social groups in geographical areas at risk such as semi-arid areas, areas with limited resources, poor social networks, low access to education, health care and other services. These social groups have to be afforded with entitlements to land, giving them access and control over resources and other productive opportunities. This will go a long way in boosting their adaptive capacity.

It should be noted, however, that rights-based approach to food security requires identifying men and women more at risk of hunger and creating the enabling environment for them to produce or access food through targeted policies. Thus affording the social groups at risk of hunger should be done in such a way that they are equipped with knowledge and financial backing that would allow them to break the circle of poverty while keeping in pace with the changing global environment.

8. Conclusion

This study has explored the challenges encountering grassroots farming communities in sub-Saharan Africa, and in particular semi-arid southern Zimbabwe. The challenges have been explored in view of global environmental change or the so-called climate change, a phenomenon that is adversely affecting entire global world. Basing on our research findings, we have argued that to enhance food security in sub-Saharan Africa, interventions by national governments, non-governmental organizations, policy makers and researchers need to capitalize on improving productive and learning-centered social interactions as these will assist farmers to make their own informed choices in terms of adapting to global environmental change and/or changing circumstances. More importantly, we have argued for a rights-based approach to food security that requires identifying men and women more at risk of hunger and creating the enabling environment for them to produce or access food through targeted policies.

9. References

1. Beck, U. 1999. World Risk Society. Cambridge: Polity.
2. Chaguta, T. 2010: Zimbabwe Country Report Climate Change Vulnerability and Adaptation Preparedness in Southern Africa
3. FAO. 1995 World Agriculture: Towards 2010. An FAO Study. Ed. N. Alexandratos. FAO, Rome, Italy, 481 pp.
4. FAO. 2005. Irrigation in Africa in figures: AQUASTAT survey 2005. Food and Agriculture Organisation. Rome: F.A.O., 2005, pp 1-74.
5. Frost, G. H. 2001. Zimbabwe and United Nations Framework Convention on Climate Change. A Working Paper. Overseas Development Institute. London.
6. Pesanayi, T.V. Southern African Journal of Environmental Education, Vol. 26, 2009
7. Rockström, J. 2000. Water resources Management in smallholder Farms in Eastern and Southern Africa: An Overview. Phys. Chem. Earth (B), Vol 25, No. 3, pp275-283.
8. Report of a Climate Change Awareness and Dialogue Workshop for Parliamentarians, Kadoma. 19 October 2009.
9. Wenger, E. 1998. Communities of Practice: Learning, Meaning and Identity. Cambridge: Cambridge University Press.
10. Zimbabwe Second National Communication to the United Nations Convention on Climate Change. 2012. Ministry of Environment and Natural Resources Management, Harare.