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Full Length Research Paper

How will climate change transform African local governance? –Assessing the role of civic engagement

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The impact of climate change viewed from the poverty context of the region will deepen the plight of the continent. Nonetheless, the engagement of the asset of local governance will bring about a lot of opportunities owing from the fact that governance is about creating opportunities with, through and for society. In the face of climate change in Africa local governance will create a number of opportunities for the benefit of the region including technological Innovation, local government finance enhancement, social capital improvement and capital and asset investment. This is against a background of passivity, half-hearted involvement and indifference by the civic society pertaining to issues of local development. This paper assesses the role of the institution of local government as it gives the general oversight over actions parametrically availed by local citizens, line ministries and departments and bilateral and multilateral agencies as they act on the ground for mitigation and adaptation to the climate change challenge with a special focus on the Africa region.

Key words: Opportunities, innovation, local initiatives, technology, infrastructure development and maintenance, citizenship.

INTRODUCTION

The challenge of climate change has brought with it many negative developments on the ground including many natural disasters and transformations that includes floods, storms and cyclones, droughts and famines, new disea-ses and increased human, plant and animal morbidity and mortality (Lawrence, 2007), seasonal changes, atmo-spheric imbalances of gases, to name but a few. With reference to Africa, climate change is taking place in a set- up where realities of natural, socio-economic, political and institutional challenges have already brought untold suffering to masses of people hence adding insult to injury for the region. It is critical to note that when disaster strikes it happens in defined spots and localities – some spatial point or local area. This implies repudiation of the abstract space of impact perspective. Because, climate change brings about challenges that happen in defined spots, areas, localities and places, a local governance perspective to mitigation and adaptation is indispensable both for policy and for action.

Local governance is a sphere of action. The guiding principle guiding this sphere is subsidiarity (Matovu, 2002; Power, 2003). Africa, in the face of climate change is spurred for more action hitherto unknown in the region. This action is by local institutions (including government and non-governmental), communities and households. For a long time, the guiding philosophy for governance was development statism with its welfare state approach. In this approach, local people (communities and house-holds) are recipients of 'aid' by government or non-go-vernmental organizations or bilateral or multi-lateral orga-nizations. Their role is to yearn, beg and wait for outside intervention in tackling issues affecting them (Gemandze, 2006; Fumihiko, 2008; Hussey, 2007). This reduces local citizens to passive actors devoid of innovative thinking to improve their livelihoods, lifestyle and general environ-ment. But a local governance approach transforms local citizens into active species determined to transform their own destinies and device own strategies to cope with life challenges.

The tempo at which climate change impacts will be felt in Africa and given the region's embedded challenges of poverty call for local government to redefine itself so that it becomes a firm champion to mobilize its constituency and resources to face up the impacts including poverties and liabilities of induced hunger and famine, property and infrastructure damages and losses, increased demand for local government finance, to name these three (UNDESA,

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2007). The impacts have both direct and indirect reverberations. A focus on local governance and not local government is preferred given the fact that the latter is rather supply-sided, one-actor-orientated, organizational, narrow and exclusive while the former is broader, all-inclusive of diverse actors and demand-sided. With a strategic focus, the involvement and engagement of multiple actors tends to bring better and widespread results which the local government drive may fail to achieve at a given time.

A local governance approach puts citizens (communities and households) as the building blocks of the transformative agenda for their environment. Fundamentally, these citizens become the 'hands' translating policies, strategies and ideas into tangible benefits on the ground. When disaster strikes, it has been noted the "indigenous peoples … are the ones who will bear the brunt of the consequences…" (UNDESA, 2007:4). It is lamentable that exclusion of people who are directly affected by a hazard or challenge often fructifies in nothing but theorizations and non-change of their appalling and atrocious situation. In the local governance excursion is also the belief that it brings about demystification of certain institutional practices, dispels corrupt tendencies and prepares citizens for participatory democracy (Matovu, 2002; Fumihiko et al., 2008). Africa has always be known for the challenges of poor institutional practises including red tape, corruption, governmental rigidity all perpetrating the ordeal of entrenched poverty (World Bank, 2003). While the impacts of climate change are rather impulsive and of a liability nature, it is equally important to note that they are also a breeding ground for new methods and techniques by the local people and institutions and themselves. Low ed. (2008) pronounces that the poorer, developing countries are the least equipped to adapt to the potential effects of climate change, although most of them have played an insignificant role in causing it. He stresses that African countries are amongst the poorest of the developing countries.

The thrust of this paper is to show how the phenolmenon and reality of climate change, as a global concern, is going to change governance at a local level in Africa; to assess the implications and, to map the way forward in the framework of the sustainable development framework. The paper will begin by giving rationale of examining climate change as a local governance agenda. It will further give a conceptual framework for the debate. By use of case studies from the continent, the paper will demonstrate realities obtaining on the ground both in terms of showing the complexity and extent of the climate change problem and what implications are there for local governance. Finally the paper will endeavour to give policy directions regarding the subject of debate.

Climate change as a local governance agenda

In its website, the City Climate Change Collaborative shows the link that exists between climate change and local government that cities, towns and communities "…are rapidly recognizing their role in reducing climate impacts." Some instruments they have adopted include local control of land use and development, building codes, water use, transportation and other regulatory policies, as well as the shaping of livelihoods make local governments the ideal leverage points for mitigating climate change impacts and addressing adaptation "(www.rosecompanies.com/climatechange). Conditions for practical combat against any challenge largely depend on local conditions (Matovu, 2002; Hazell and Johnson, 2002). Moreso, a scrutiny of local conditions is more practicable than any in an atmosphere of good governance, a concept and notion emphasizing the rule of law, transparency, accountability, accountability, subsidiarity and reciprocity. Local governance is a sphere for transmutation of these principles into action by taking heed to local conditions as shaped by the institutions of local government, community-based organizations and others of the same qualities working at the local level.

It is important to note that municipal authorities are responsible for a range of different functions. Conven-tionally speaking, local government has a number of functions in its ambit namely: service functions to a broad spectrum of people and property including garbage col-lection, water supply, sewerage, public toilets, drainage, roads and street lighting, public and environmental health, libraries, recreation , parks and community ser-vices; regulatory functions which are about control and administration of laws governing building, town planning, environmental health, subdivision, parking, noxious we-eds, animals, advertising and parks; representation func-tions, that is a legal responsibility to their constituents to carry out the obligations placed on them and act in the interests of the community and electors (voters); commu-nity planning and coordination functions, which is about providing a focus for planning and coordinating services and facilities provided by government agencies, voluntary and community groups and participation functions which are about providing opportunities for community participa-tion in policies and decisions affecting the local commu-nity. The functions are performed or managed by many different parts of their (local government) organisations and in Africa, this is often with limited resources. According to FMECD (undated), local government and administrative units "…offer a chance for achieving more efficiency, transparency and responsiveness to public needs and can make a contribution towards fostering democracy." In addition, decentralisation "…can improve opportunities for ensuring participation by various (ethnic, political, economic, social and religious) interest groups and can thus help reduce sources of conflict in society. Moreover, stronger local ownership can act as a catalyst for economic development" (FMECD, undated).

Conceptual framework and related literature

Gemandze (2006) maintains that in the African "…context

development must be construed initially as rural development generally and more specifically, as agricultural development." This is supported by the fact that seventy percent of the population in Africa belongs to the rural sector, of which the majority is peasants (Power 2003; Hazell and Johnson, 2002). For the rural sector one can see the majority of the population live precariously in economic terms. Overall, peasant farming is a 'high risk' venture. Scott (1976), relating to the Southeast Asia context, highlights that the principal crises facing the sector are "…local drought, floods, epidemics, that destroy[ed] plough animals, winds or rain at the harvest, that beat down and spoil[ed] much of the grains, or birds, rats or crabs that ravage[ed] the crop….". Furthermore, claims by outsiders in the form of rent and taxes tend towards the embedded income insufficiency. Tawney (1966) in Scott (1976) concludes that the position of the majority of the rural population (predominantly peasants) is likened to "…that of man standing permanently up to the neck in water, so that even a ripple is sufficient to drown him". Crop yields in this small farm sector are usually below agronomic potential due to several factors including those which are edaphic, climatic, cultural, social and economic. ICSU (2006) asserts that the fact that 43 African countries are heavily indebted makes Africa the least equipped and prepared continent to cope with the impacts of hazards and disasters. Drought and combinations of drought and hydro-meteorological hazards dominate both mortality and economic losses in sub-Saharan Africa.

PwC (2005) discusses the process of navigation in strategic visioning by local authority; four possible actions by stakeholders are feasible namely:

I. Inaction, where there is no trends' interpretation.
II. Reaction, which is responding to the agenda of others.
III. Pro-action, involving detailed plans for the future and set trends.
IV. Interaction, which is about shaping and respond-ing to changing trends over time.

These four possibilities hint on the way Africa has taken the climate change over time. Initially, the idea was just phantasmagorical. This corresponded to a phase and era of inaction. Without accurate information it is difficult for reasonable action to take place by anyone. If ever action happens in the context of information dearth, it tends to produce panic, alacrity and pandemonium hence reaction. In the reaction stage in Africa, climate change came to be considered as a Western agenda, particularly, the notion of global warming. Only recently, have some few local authorities and countries started earnestly preparing, in a proactive way, plans taking climate change as a grave agenda in quest for environmental sustainability. Yet, the idea must be taken further until it becomes more and more interactive and transactive. This is a phase of the engagement for forces in the domain of local governance.

Earthwatch (undated) defines adaptation to climate change as "… increasing resilience to and reducing vulnerability to climate change by taking pro-active action." (cf. IISD, 2003). In the sphere of local governance, plurality and diversity, strong forces charactering many a society and communities, are taken on board. This is in consideration for sustaining places and development accruable to them as different stakeholders invest their intellect, money, labour and other resources (Chambers and Conway, 1992). In many parts of Africa the consultative engagements involving argumentations on issues affecting them are primary in shaping communities though the patriarchal domination characterizing the region often marginalizes children, youths, women and migrants (World Bank, 2003). In keeping with community consultations and participation and the government role, PwC (2005) asserts:

> Many citizens would like to be more involved in the deci-sions which affect their neighbourhoods and quality of life. However, too often citizens feel that decisions are made for them without their views being considered. Of course, most cities have very diverse populations with a wide range of 'communities of interest'. It is therefore important for governments to consult widely with their citi-zens to engage them in debates and to capture the range of views across the population. Asking for citizens' views is not enough–governments must also act on them.

FMECD (undated) stresses that, this is in line with the model of administration as practised by functioning, citizen-oriented states that operate according to the basic principles of democracy. Local government at regional, district or municipal level has the legal mandate to ensure that water supply services are delivered and supported but due to insufficient resources service delivery is compromised. Local governance on the other hand, embraces a wider range of organizations, both local government and beyond.

The notion of climate change in Africa tends to be discussed in the framework of poverty and development (EU, 2007; Chirisa, 2008). There is vast evidence to show that the continent is under great stress due to the general poverty levels of its inhabitants. Both rural and urban areas harbour untold suffering, part of which can be attributed to the limited knowledge in environmental management as well as the general scarcity of the much needed resources among the poorest sections of the communities (Chirisa, 2008). Poor environmental management strategies are explained by the great incidences of veld fires in many countries of tropical Africa including Zimbabwe, Zambia, Tanzania, to name but these three. As well, the populations tend to rely much on their natural environment for survival (Hazell and Johnson, 2002). This dependency would not be much of a problem should the people and their stocks not exceeded the carrying

capacities of their environments (Power, 2003). This phenomenon explains how the region is increasing its ecological footprint most of the times leading to desertification, for instance in the Sahel region, a zone immediately after the great Sahara desert (Earthwatch, undated). In effect, the whole essence of desertification in the country means that the desert conditions are fast encroaching and etching the ecologically productive and stable areas.

The immediate consequences of desertification in Africa have been the disappearance of the biodiversity, increased moisture stress in the form of incessant droughts leading to a vicious cycle of poverty among the populations. Governments are then left with a great burden to feed their populations by importing foodstuffs from neighbouring as well as overseas countries. Such is a great cost to the resources of the fiscus (CURE, 2003; Power, 2003). Thanks to the non-state actors in the form of international non-governmental organizations (NGOs) like World Vision, Care International, International Red Cross and the Red Crescent societies, Catholic Relief Services, Oxfam, to name but a few, whose intervention in food aid and crafting alternatives for the poor in the region has been very critical. Evidence has it that the most arid parts of the region are the very zones of international aid concentrations. In Zimbabwe, for example, places like Chivi in Masvingo, Buhera in Manicaland and many parts of Matabeleland are rich with NGO activities. Local populations tend to group themselves so as to maximize on benefits from the donors. When such grassroots organizations take shape, the aspect of local governance comes in. sometimes donations are so targeted that the majority of the populations are excluded in the beneficiaries' lists. In some cases, some of the populations devise deceptive ways so as to fit in the lists like registering with as many NGOs as possible so as to benefit from all of them. In such cases, the problem of non-productivity comes in as individuals down their tools for productive farming choosing to be perennial beggars (Power, 2003).

In understanding the notion of how climate change may transform Africa, it is important that the positive aspects of development be nurtured and emphasized (Hazell and Johnson, 2002). This implies captivating aspects including infrastructure development and maintenance, social capitalization, applying sciences for both preventative and mitigating strategies, community visioning, to name but a few. The negative impacts of climate change (flood-ing, droughts, diseases and epidemics, infrastructure deterioration, etc) tend to outweigh the benefits (Thrupp, 1998; Lawrence, 2007). This is the reason why positive action, in the framework of community participatory planing and sound community governance, are keys to the enhancement of the local environments as well as the upkeep of better standards for community development (Fumihiko, 2008). One grand way of transforming the continent in the context of climate change is to ensure that there is sustainable development influenced by the indigenous technical knowledge and a shared vision among the various stakeholders (Hazell and Johnson, 2002) . It should also be noted that once local communities are discussed as being empowered, there is an element of decentralization and the truest form is devolution whereby institutions are cultured to move away from being dominated by the centre but become self-dependent and autonomous in all forms including in fundraising for sustenance (CDG, 2000; Chambers and Conway, 1992). The next section deals with the important aspects of climate change and development, in detail.

Empirical realities: climate change and development in Africa

Studies on climate change show that Africa, like the rest of the world, became warmer over the past century and temperatures are expected to continue to rise in the future (Figure 1). Heat waves are predicated to be one of the hazards that will be associated with climate change. Moreover, the problem will be exacerbated by changes in lifestyle linked to urbanisation. ICSU (2006) asserts that, there are no statistical records on loss caused by past heat waves in Africa. Yet, various incidents have been reported, for instance, in Botswana.

ICSU (2006) further affirms that Africa is a continent prone to a wide variety of natural and human-induced hazards and disasters. Hydro-meteorological events give rise to the majority of disasters, impacting nearly every country in sub-Saharan Africa. These include floods, tropical cyclones, storm wave surges, droughts and related disasters (extreme temperatures - cf. Figure 1 and forest/scrub fires), sand or dust storms, landslides and avalanches. ICSU notes that in the period 1975-2002, disasters of hydro- meteorological origin constituted 59% of the total natural disasters in sub-Saharan Africa, with floods accounting for 27%, drought for 21%, windstorms (particularly tropical cyclones) for 9% and wildfire accounting for 1% (Fields, 2005; Low, 2008; afrol News, 28 August, 2008; Herald, 12 Jan. 2009).

Floods and flash floods cause loss of life, damage to property and promote the spread of diseases such as malaria, dengue fever, cholera and chikungunya. From 1900 to 2006, floods in Africa have affected nearly 40 million people, killed about 19,150 people and caused damages estimated at nearly US$ 4 billion. Africa ranks third after Asia and the Americas in frequency of flood events (ibid.). Weather systems characterised by extreme winds and rainfall, known as tropical cyclones in the Indian Ocean and hurricanes in the Atlantic Ocean, are generated between latitudes 5° to 20° when sea temperatures are sufficiently warm (Herald, 12 Jan. 2009). Tropical cyclones can cause huge economic losses, especially on island states, by damaging dwellings, infrastructure (power, telecommunications and roads) and fisheries. The impact of these storms on coastal communities is

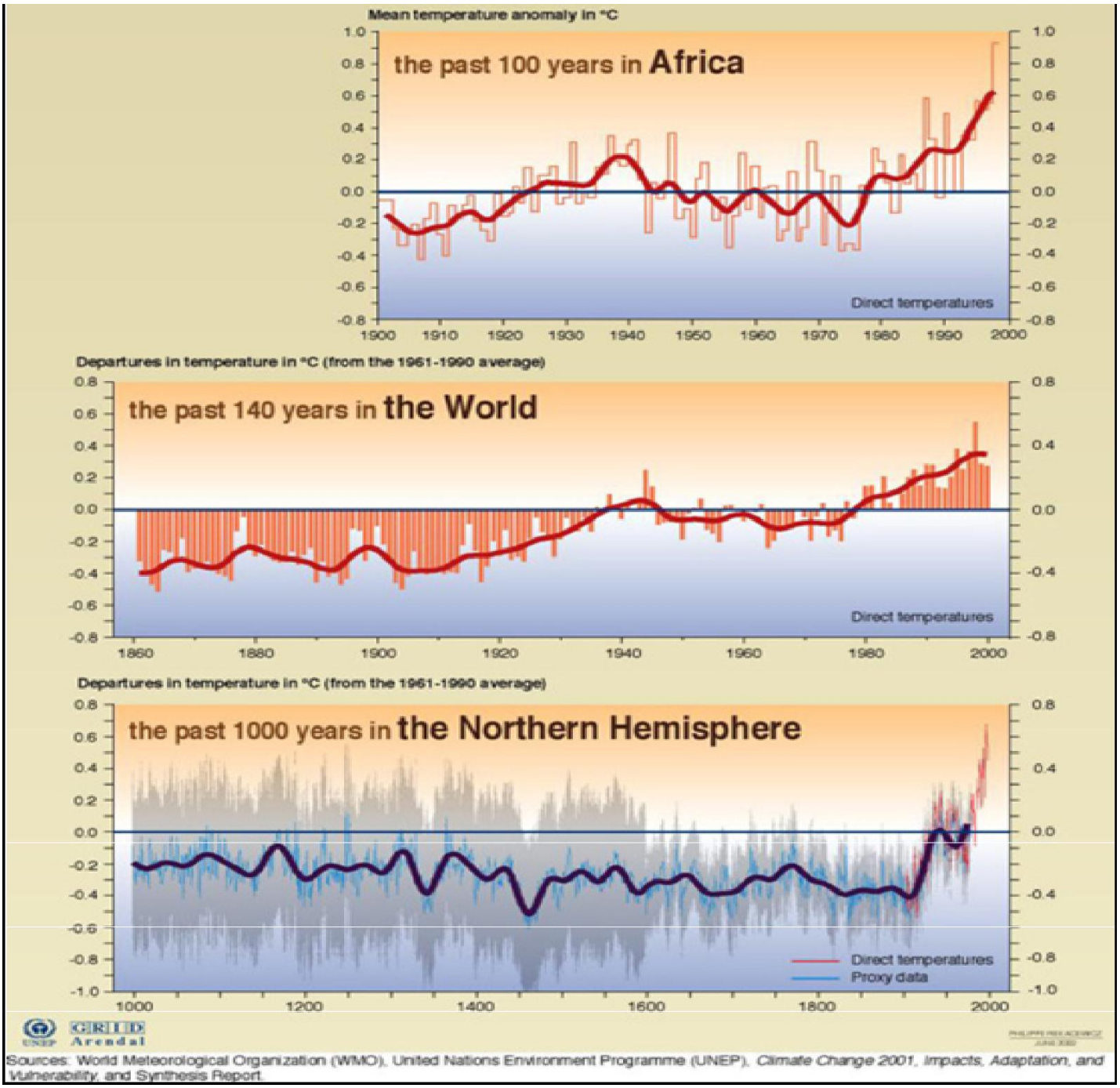

Figure 1. Variations of the Earth's Surface.

Box 1. How climate change threatens Africa?

Studies conducted by German and African researchers found that Africa's rainy season has delayed by a month relative to continent's rain patterns 40 years ago. Africa will experience high temperatures as well as reduction of rainfall in its sub -Saharan regions. Between 75 and 250 million Africans are at the brink of facing serious water supply shortage by 2020. Agriculture outputs in some countries could suffer a 50% decrease due to the effects of climate change due to largely human activities. The average world rate of the rise in sea level is between 1.8cm and 3.1cm per annum from 1961 to 1993. Forecasts indicate that the rise in the sea level will be between 18cm and 59cm in the end of the 21st century.
Source: afrol News, 28 August, 2008

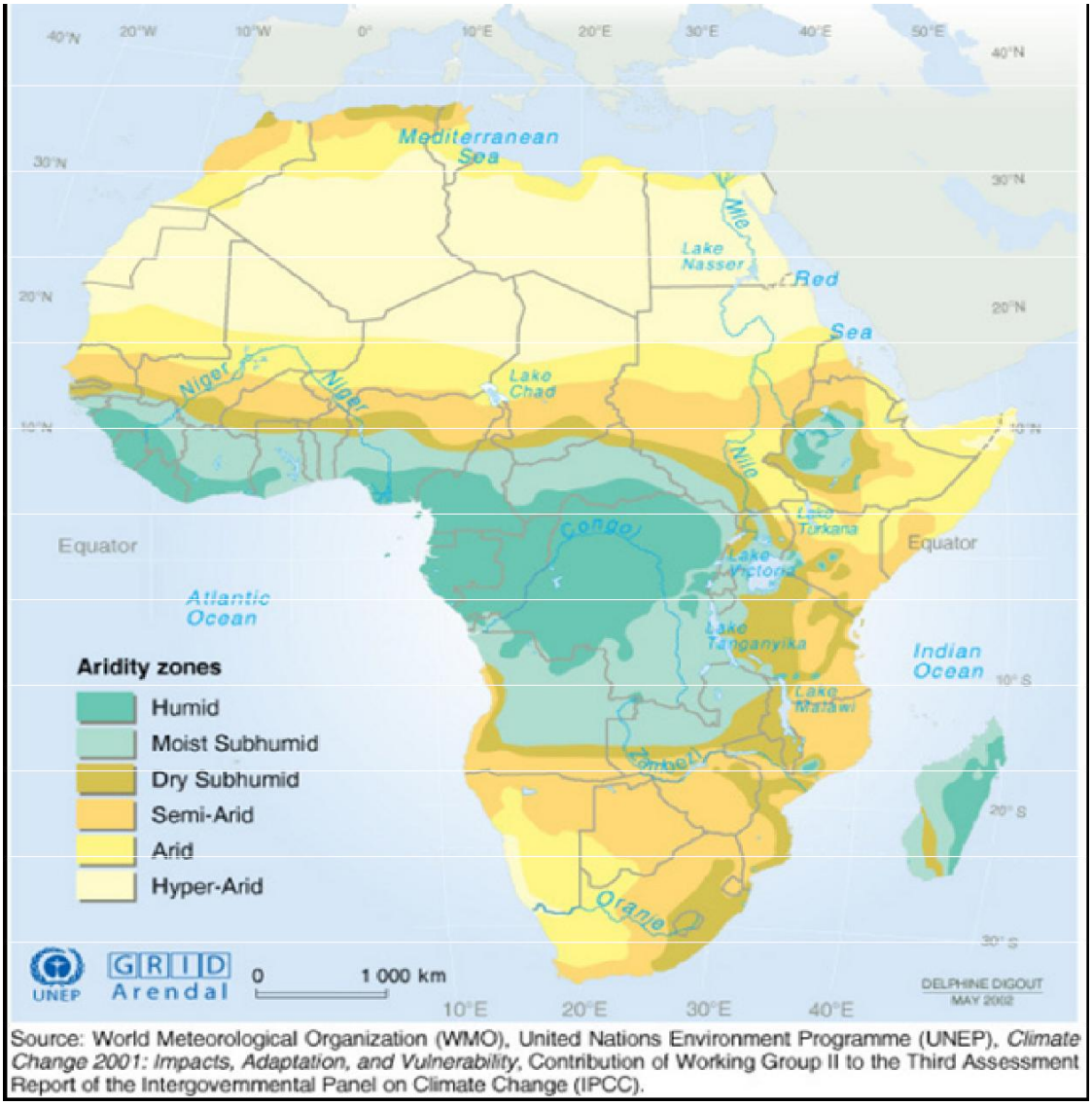

Figure 2. Aridity Zoning in Africa.
Source: http://maps.grida.no.

exacerbated by the destruction of natural barriers such as mangrove swamps (ICSU, 2006).

According to http://ecosystems.wcp.muohio.edu, Africa's most important climatic element is precipitation. Regional projections of precipitation change diverge quite strongly in Africa. Thus, for agriculture, there is little confidence in present scenarios for precipitation—the most important aspect of climate change for African agriculture (Box 1; Thrupp, 1998). The general conclusion is that climate change will affect some parts of Africa negatively, although it will enhance prospects for crop production in other areas. Some regions could experience temperature stress at certain growing periods—necessitating shifting of planting dates to minimize this risk.

Because a large portion of African agriculture is rainfed, however, heat-related plant stress may reduce yields in several key crops—such as wheat, rice, maize, and potatoes. Some regions, for example, may be less competitive in national and global agricultural markets, with corresponding impacts on exports and imports. Africa, in particular, may be sensitive to changes in world prices and stocks because many countries rely on food imports. African economies depend on natural resources, and the impact of changing natural resources affects several sectors of the economy (http://ecosystems.wcp.muohio.edu/studentresearch/climatechange02/agriculture/AGROproject.html).

ICSU (2006) further outlines that along the East African Rift, the high topography coupled with seasonal rainfall, constitutes the main factor for generation of landslides. In Kenya the El Nino weather phenomenon in 1997-1998 caused widespread landslides and floods in various parts

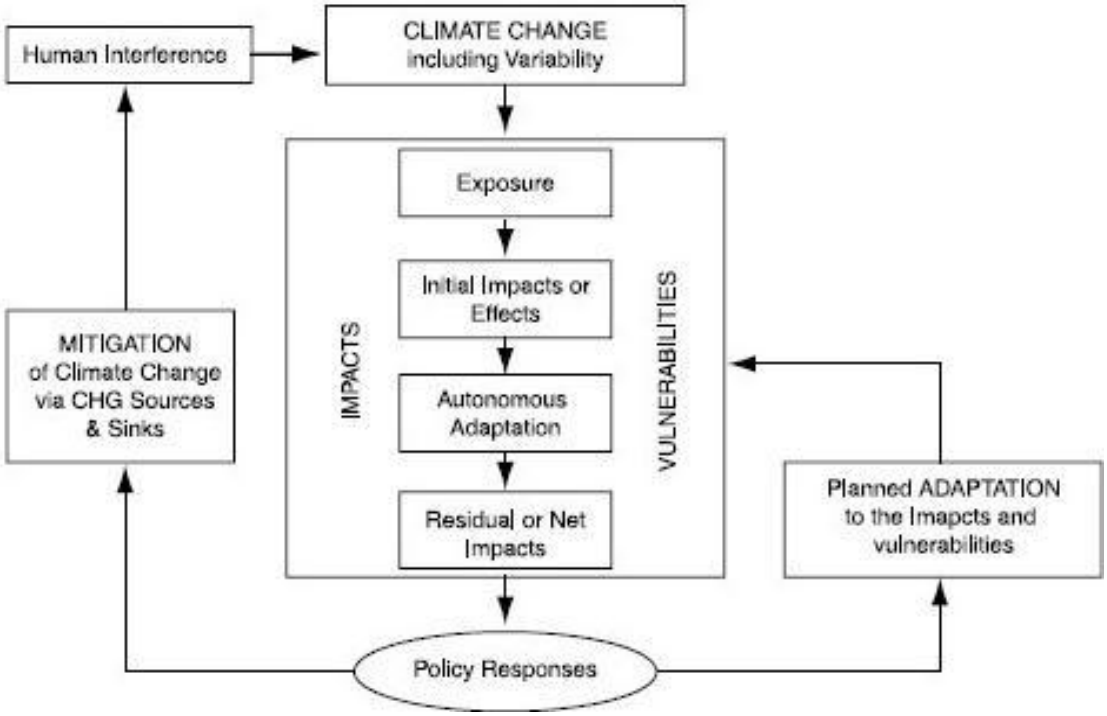

Figure 3. The place of adaptation in the climate change agenda.
Source: Smit et al. (1999) quoted in CURE, 2003.

of the country. The national economic loss due to landslides was estimated at US$ 1 billion. Another challenge induced by stormy events is situation of rivers and dams which results in shallow waters with severe implications on irrigation schemes and consequent reduction in agricultural production as has been the case in Zimbabwe. It is noted that in Mauritius, deforestation has accelerated erosion.

The drought phenomenon affects a large surface area of the sub-Sahara, especially in the Sahel with annual rainfall of 150-600 mm, as well as much of Southern Africa, including regions outside the Kalahari. The 1970-1974 droughts in the Sahelian region caused unprecedented losses in human life, livestock and environmental damage (ICSU, 2006) (Figure 2). The Sahel region is one of the largest sources of dust storms in the world. Summer storms from the Sahara kick up millions of tons of dust that alter air quality, affecting animals, plants and the weather. Scientists in the Niger-based Centre de Recherche Médicale et Sanitaire (CERMES) have found that dust storms blowing across the Sahel might be linked to lethal meningitis outbreaks that often hit this region and its 300 million inhabitants. It has been noted that currently, there are no warning systems for tornados and hailstorms anywhere in Africa. As well, due to their limited impact compared to other hazards, there has been very little research conducted in Africa on hailstorms and tornados (Figure 3).

With reference to the foregoing phenomena it can be noted that climate change is, to a large extent, negatively impacting development in relation to people in the continent including:

i. Destruction of biodiversity upon which most Africans draw their living.
ii. Destruction of infrastructure, particularly, roads, bridges and buildings with the implication that a lot of financial resources should be raised in order that repair and maintenances can be achieved.
iii. Increased dependency on the central government and donor agencies for food handouts, 'killing' the local agricultural productive skills and will.
iv. Increased diseases and epidemics, sometimes resulting in some households having to foot medical bills on their own thus deprecating the philosophy of savings; most of the households in Africa are without any form of insurance against vagaries of life.

To reverse the adverse aspects highlighted here and elsewhere, the section of policy directions will indicate how communities can do mitigation in the face of climate change in the continent. But, it must also be stressed that the Africa poverty, the political climate in some part of the region explains why the populations are 'ever stressed', for instance, Darfur in Sudan, Somalia, Zimbabwe, the Democratic Republic of Congo, to name but a few. War and violence, when coupled with climatic change perversions, not only destabilize communities but reduce governance to a myth. When this happens communities fail to participate in development let along initiate it for fear of being misquoted and misinterpreted.

Box 2. Describing the SMAARTS Acronym.

Sustainability: This means the piece of technological equipment acquired must be such that end users can understand, operate and repair it.
Maintainability: This implies that the technological equipment must be easy to install, maintain and repair so that users are prepared to undertake maintenance work and to effectively respond to breakdowns.
Acceptability: This advocates for a technology that people relate to i.e. sense of identity, ownership and responsibility.
Affordability: This has implications for cost maintenance for the piece of technology such that spares must be affordable and available, better if locally produced.
Reliability: This means that the technology must be reliable and durable and long-lasting.
Transferability: This implies that users should associate with the technology, have appropriate technical and sociological training so that the technology can easily be adopted in other localities.
Suitability: This implies effectiveness of technology so that advantages of it are clearly apparent in ease of abstraction, quantity and quality.
Source: Hussey, 2007.

Policy directions and way forward

Climate change is a crosscutting issue. This implies that each sector of society is affected by it: health, education, agriculture, transport, water and sanitation, construction, energy, housing, forestry, biodiversity, to say the least. Most of these sectors are anchored in infrastructure and service provision. To ensure that there is coordinated development along the vein of local governance, many African countries, from the mid-1990s adopted the sector wide approach whereby government and donor activities are integrated within a sector (World Bank, 2003). This has a harmonizing effect on issues or themes agreeable for change. Following the launch of the Local Agenda 21 at the turn of the new millennium, there has been also a widespread emphasis and adoption of environmental impact assessment policies. Yet, climate change as an issue still lacks full mainstreaming into local development programmes. Sibanda, (interviewed, 2008) affirms:

> …though environmental impact assessment policies have become an important feature for development guidance and direction, developers often use the reports more as 'title deeds' and 'passports' for their business endeavours than as documents to take serious mitigation measures against adverse impacts that their actions have on the environment. This approach is capitalist, exploitative and selfish.

Climate change in Africa, like any other regions, requires a clear policy framework highlighting impacts, vulnerabilities, mitigation and adaptation measures and strategies (Figure 3) . This helps in the solicitation of appropriate actions to influence right local action by both citizens and institutions in that place. If this is done in the context of governance no doubt more opportunities will be 'brewed' from the laboratory of local citizenry, local and central government and non-governmental organisations.

Governance is about creating opportunities with, through and for society. In the face of climate change in Africa local governance will create a number of opportuni-ties for the benefit of the society. The following are some of the issues and policy trends in conjoining the climate change and local governance agenda in Africa:

Technological Innovation for Community Mitigation and Adaptation for Climate Change: Hussey (2007) designed what he refers to as the SMAARTS checklist used in selecting, operating and maintaining appropriate technology. Box 2 gives description of the SMAARTS acronym. Climate change in Africa is calling for involvement of local citizens to adapt as well as mitigate to the impacts of the climate change for though they are ubiquitous, they hit at specific local points (Herald, 12 Jan. 2009). In housing, for example, a modular approach may be necessary and these may include having cluster housing in a common community wall against severe storms or maintaining local infrastructure including potholed roads and other likely damages (Hazell and Johnson, 2002). Technological innovation ought to be done in the context of information enhancement for good governance. "Environmental education of the public through presentations at schools and information sharing with the media and environmental NGOs, will greatly increase a city's ability to monitor compliance at a relatively low cost" (USAID, URL: http://www.makingcitieswork.org). Public environmental education is embedded in the practice of social, policy and scientific research which should synchronically diverged and converged towards better analysis of aspects and issues and co-ordination, respectively.

Scientific research on climate in Africa: Afrol News (13 October, 2008) notes that reconstructing the climate of the past is an important tool for scientists to better understand and predict future climate changes that are the result of the present-day global warming. It further asserts that, although there is still little known about the Earth's tropical and subtropical regions, these regions are thought to play an important role in both the evolution of

Box 3. Green Sahara more common than thought.

Today's Sahara desert has been dominated by grasslands and trees more times in the recent geological past than earlier assumed; at least three times during the last 120,000 years. Too little is still known about the Sahara's climatic history, and scientists are unsure whether the desert may be greening right now. New North African climate reconstructions made by the northern German university reveal three "green Sahara" episodes during which the present-day Sahara Desert was almost completely covered with extensive grasslands, lakes and ponds over the course of the last 120,000 years. The scientists explain these periods by an increase of the precipitation that resulted in a much larger vegetation cover resulting in less wind dust and stronger river activity in the Sahara region. The "green Sahara" episodes correspond with the changing direction of the earth's rotational axis that regulates the solar energy in the tropical Atlantic Ocean. Periods of maximum solar energy increased the moisture production while pushing the African monsoon further north and increasing precipitation in the Sahara. They therefore conclude differently from several other studies, which have linked a green Sahara with periods where the global climate was hotter than presently, and some of which even indicated that global warming could lead to the foresting of the desert.

Source: afrol News, 13 October, 2008.

prehistoric man and global climate changes. In addition, computer model simulations for the future suggest an expansion of the vegetation cover in the Sahara Desert if human-driven climate change leads to aggressive global warming. However, it is difficult to conclude that the Sahara will actually become greener than it is today, as the simulations do not account for the influence of human activity in this area (Afrol News, 2008; IISD, 2003). Box 3 is a summary of some climatic trends requiring earnest scien-tific research.

Scientific research is critical for capturing emerging climate trends so that variability of climate elements and vulnerability of places are mapped (Figure 4). Involving local citizens in these activities (researching with them) will help in prompting them for disaster preparedness as well as in devising appropriate technology for mitigation and adaptation including groundwater management, forest management, housing design and infrastructure maintenance.

Social capitalisation and local governance enhancement: Local governance, spearheaded by the local government systems is a platform to improving the consistency and coherence between different policies, from an environmental and community perspective and a means to maximise the effectiveness of those policies within available budgets (EU, 2007; Hazell and Johnson, 2002). This is because it offers greater transparency in policy development and encourages a greater public involvement and acceptance. As citizens are involved in policy directly affecting them, they are inspired for action. The impacts of climate change for Africa, like any other region in the world are like a homing pigeon tending towards affecting citizens in the places of residents. From a viewpoint of attributability, climate change comes in on the African agenda of local governance as an exogenous force, western-induced. It is noted that Africa is the most urbanizing continent in the world now, yet its contribution to urban carbon emissions is very negligible. From this viewpoint, the region is more of a 'victim' than a contributor. It is an issue rather to be dissected in the perspectives of mitigation and adaptation than finger pointing. All local citizens and institutions ought to be streamlined to the thinking of capitalising on local as well as regional and global networks with a thrust of toning down the hazards of climate change and global warming. Before any tangible benefits that accrue from the process, are the benefits of enhanced knowledge, best practices and decentralised co-operation.

Local Government Finance Enhancement and Infrastructure Investment: For the reason of income insufficiency the contribution of the rural population to local government finance for the development of their area of settlement is usually too infinitesimal for meaningful development. The same applies to the urban sector in which the majority is in the extra-legal sector, better known as the informal (Chirisa, 2007; 2008). Local government tends to be a chocked sector due to very little, if any, financial contributions by the citizens under their jurisdictions. Citizens tend to anathematize the local government system and as a result, to free-ride on services provided by the institution (Chirisa, 2007; 2008). Without redressing this obtaining scenario, it becomes too tricky to withstand pressures brought about by climate factors that are changing – increased storms that wash away bridges and cause potholes on both tarmac and gravel roads, for instance. Climate change is an action prompter; yet action is often determined by other factors including avai-lability of resources as well as a package of devised and perceived options to tackle the situation at hand. The tool of participatory budgeting will help in tying local finance mobilisation to locally objectively verifiable priorities for local development. Citizens desire not only to see the value for their money on the ground but also to directly participate in the direction of local development and management, and above all to have oversight of local projects. Climate change will trigger a lot of development

Figure 4. Climate Change Vulnerability in Africa.
Source: http://maps.grida.no.

and ongoing projects in many locales in Africa. As part of the social accountability programme, these projects will require vibrant, robust and more responsive local governance systems but guided more by community strategic visioning.

The Local Governance Initiative for Community Strategic Visioning: Strategic visioning for local community development in the face of catastrophes induced by climate change in Africa will work basing on the 'soft infrastructure' of decentralization, co- operation and governance. These are also expressions of participatory democracy the application of place stewardship principle. Wildlife Habitat Canada (September 2006) defines stewardship as "…a collective and collaborative process

Table 1. Stakeholders in the climate change-local governance debate and practice.

Stakeholder type	Located	Key responsibilities	Challenges and constraints
Multi-lateral and bilateral organizations	Outside	Defining concepts and global as well as regional agendas. Financing projects and programmes.	Having a bird's eye view of the issues hence lack of the grasp of local arrangements.
Central governments	Outside	Setting national policies and legislations Providing technical advice to stakeholders.	Enforcement of legislative provisions tends to be difficult due to technical staffing challenges.
Local government ministry	Outside	Oversight of projects and programmes implemented at the local level. Making integrated plans for stakeholders and climate change Providing technical advice to stakeholders.	Technical staffing challenges Equipment and machinery constraints
Department of Meteorology	Outside	Providing parameters for climate change. Providing mechanisms for Monitoring and Evaluation (M&E). Providing technical advice to stakeholders.	Technical staffing challenges Equipment and machinery constraints
Local authority/council	Local	Mainstreaming climate change into council agenda. Defining local issues, challenges, constraints and strategies to combat climate change. Developing municipal byelaws for mitigating and adapting to climate change. Providing technical advice to stakeholders.	Technical staffing challenges Equipment and machinery constraints Political set-up
Private sector organizations (including NGOs, CBOs and the corporate world)	Local	Having buy-in in projects and programmes suggested by local citizens and helping in funding the initiatives Advocacy and lobbying	Political challenges
Households	Local	Implementing mitigating and adaptation tools for climate change.	Illiteracy Poverty Corruption Other

Source: Authors' creation.

in which planning, management and ongoing evaluation are meaningfully shared and where competing and possibly conflicting, social, cultural and economic interests are held to a higher standard and differences negotiated and hopefully adjudicated". Unless the local citizens are informed, inspired and mobilized to work together, local challenges will continue to be treated as abstract, far-fetched, irrelevant and remote. Yet, for local governance to happen, the chief driver and trigger is political will. Climate change offers opportunities for leadership transformation towards the broader objective of creating and enhancing habitable and sustained environments free from the hazards of flooding, storms, deficits and stresses (USAID, undated). For the realisation of this objective local citizenship engagement is not only noble, desirable and splendid but also mandatory, meaningful and fruitful. Community strategic visioning calls for serious acknowledgement of all stakeholders in the climate change and local governance debate whose location, key responsibilities, and challenges and constraints which they face must be known for the devising of practicable strategies (Table 1).

Conclusion

Infusing a community spirit and purpose in citizens is reasonably painstaking. For Africa, there are many challenges to overcome including poverty, corrupt tendencies, cultural barriers, among other things. That climate change is a natural challenge is obvious yet tackling the problem requires more that natural and physical strategies. Before physical measures, socio-political measures in the form of re-engineering the local governance system is not only desirable but rich with practicable solutions to influence the physical means to the solving the problem. Sociologically, the possible strategic visioning devisable has the manifestation of the 'unity in diversity' thrust, which aspect would require scores of investment of the spiritual capital through motivation and inspiration of the locally affected citizenry by any natural hazard. "For a

plan to succeed, everyone must believe in it and act as though it were their own." (Jingxia and Li, undated: p. 40). Politically, local governance subsists in the decentralization framework. With reference to German development cooperation, FMECD (undated) asserts that decentralization means the delegation of tasks, responsibilities, resources and political decision-making authority to a country's medium (for example provinces, districts, regions) and lower political levels (cities, local authorities, villages). But the understanding of decentralisation goes beyond purely administrative decentralisation (deconcentration); local governance requires geographically defined administrative units, each with its own separate set of tasks, sufficient own resources and democratically legitimised representative bodies. Although the local government system is service delivery oriented and enjoys the supremacies of technical and policy guidance, without engagement of other actors and primarily the local citizens, its efforts would be futile and least rewarding. Thus tackling the nightmare of climate change requires engagement of all local governance forces which is something far beyond administration and government (cf. Hazell and Johnson, 2002). Instead of local communities just drowning into the cesspools of poverty and hazards attributable to climate change, discernable optimistically, are opportunities for technological innovation and diffusion, social and human capitalisation, enhancement of local government finance and enhancement of the local governance agenda and practice in Africa. Strategic visioning in the context of serious community engagement is critical for the region.

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