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An Analysis of Climate Change, Poverty and Human Security in South Africa

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ABSTRACT In South Africa, climate change mitigation poses significant challenges to the South African Government because it has to juggle the climate change imperatives , with the critical issues of poverty and human security, as well as a host of daunting development challenges inherited from the Apartheid regime. This paper utilizes a qualitative methodology to collect and analyse data on climate change, poverty and human security nexus in South Africa. It outlines the development challenges and development policy responses targeting poverty and human security. The analysis of the causes and effects, as well as the impact of climate change, is followed by a discussion of the delivery of basic social services and the resultant public disaffection leading to violent service protests. A significant proportion of South Africans, especially the poor, have to contend with poverty, a lack of basic social services and unemployment which are being compounded by climate change. The final section of the paper argues that despite significant service delivery milestones, little progress has been made on the central objective of reducing poverty and inequality. Consequently, although a lot has been achieved in terms of the legislation, policies, programmes, and provision of basic services for the poor, the challenge facing the South African Government is how to link the objectives of poverty alleviation policy with those of climate change and human security priorities within a sustainable development framework. The paper recommends that in order to reduce poverty and increase the poor people's capacity to adapt or respond to climate change the government will need to: firstly , mainstream or integrate climate change adaptation with sustainable development policies; and secondly, improve the capacity of local authorities to effectively deliver services to their communities . This paper has been motivated by the explosion of service delivery protests around the country, which have become violent and increasingly xenophobic resulting in attacks on African nationals and foreign –owned small businesses in the townships and informal settlements.

INTRODUCTION

Climate change has not only become one of the most pressing global development challenge but is also increasingly recognized as a major human security issues for the 21st Century (UNDP 2007; World Bank 2010). Furthermore, a greater realization has emerged that for the poor the impact of climate variability is severe, disproportionately affecting their livelihoods and security. Consequently, human security has also become closely linked to human development in the face of climate variability. Human security affects the various crucial aspects of well – being such as security from physical violence, food security, livelihoods, environmental security, health security and political security (UNICEF 2008: 2; O'Brien and Leichenko 2007: 3).Climate change undermines human security by reducing access to resources that are essential for sustaining livelihoods (Barnett and Adges 2007; Kumsa and Jones 2010) and may potentially exacerbate and reinforce the trend towards social instability that may already exists in some societies (Brown and Crawfold 2009: 4).Consequently, climate change may increase the risk of violent conflict due to the fact that it may undermine the capacity of the state to provide the opportunities and services that people need to sustain their livelihoods. It is for this reason that the fight against poverty, human insecurity and. climate change has come to be viewed as interrelated, as well as become a global concern in the development discourse.

In South Africa climate change mitigation poses significant challenges because it has to juggle the needs of its energy-intensive economy based on coal with resultant very high emissions, with a host of daunting development challenges inherited from the Apartheid regime (Winkler et al. 2009; Earthline Africa/ Oxfam 2009). The apartheid legacy "left deep scars" of inequality and poverty amongst the majority of the black population.This group of citizens was char-

acterized by abject poverty and minimal access to basic services (Chikulo 2003). In order to meet the high expectations amongst the black population following the demise of the apartheid regime and transition to a new democratic dispensation in 1994, the government placed poverty alleviation at the top of its development agenda. The centrality of poverty alleviation is reflected in The Constitution of the Republic of South Africa, Act 108 of 1996, which emphasizes developmental rights, pertaining to the right to adequate housing and the provision of basic services such as water, sanitation and electricity. According to Section 24 of the Constitution the provision of basic services are supposed to be anchored in a framework for sustainable socio – economic development. The Constitution also provides for the promotion and protection of the country's natural environment, and the rights of citizens to access and enjoy a healthy natural environment. The constitution provides the broad policy framework for climate change mitigation initiatives, as well as the context within which the government seeks to reconcile the tension between development, especially poverty alleviation and mitigation objectives in several policy frameworks: The Reconstruction and Development Programme (1994), the Growth, Employment and Redistribution Strategy (1996), the 2004 National Climate Change Response Strategy for South Africa (2004), the Accelerated and Shared Growth Initiative (2006), and the Anti-Poverty Strategy for South Africa (2008). This paper has been motivated by the explosion of service delivery protests around the country, which have become violent and increasingly xenophobic resulting in attacks on African nationals and foreign-owned small businesses in the townships and informal settlements. The violent protests and attacks on foreign nationals are a reflection of the fact that climate change is increasingly undermining the capacity of the to fight against unemployment, poverty and human insecurity.

Socio-economic Profile

South Africa has one of the most sophisticated free-market economies on the African continent .South Africa's economy is characterized as middle - income developing country. It accounts for approximately 40 percent of all industrial output, 25 percent of gross domestic production (GDP), over 50 percent of generated electricity and 45 percent of mineral output in Africa (Mqadi and Steynor 2005), and is also the largest emitter of greenhouse gases on the African continent and the world's biggest single emitter of CO_2 at 7.8 tons of CO_2 annually (including non-energy emissions). This constitutes the 37th-highest CO_2 emissions per capita, higher than many OECD countries (Earthline Africa / Oxfam 2009).

While the economy displays many first world-features, including a sophisticated financial and physical infrastructure, good telecommunications and energy supply networks, and one of the top ten stock exchanges in the world, the country is, however, plagued with wide disparities in wealth. According to the Human Development report (UNDP 2012: 163), South Africa's Gini Index is 67.4,with Human Development Index of 0.619 and is one of the most economically unequal countries with a GNI per capita of, 9 469 South Africa is ranked 53rd indicating a wide gap between economic wealth and development (UNDP 2012: 155).

The population has grown from 40 million people in 1994 to nearly 51.8 million in 2007, with the number of households growing faster than the population, from 8.7 million in 1994 to 14.43 million in 2012 (StatSA 2012) thus posing additional challenges for poverty alleviation efforts and the provision of basic social services, as well as climate mitigation measures.

Climate Change Policy and International Agreements

South Africa has signed and ratified several international conventions and treaties, as well as adopted national, sectoral and local regulatory instruments that underpin environmental and climate change governance issues. These are as follows:

International (Global) Frameworks

- ***Intergovernmental Panel on Climate Change IPCC) (1989):*** This is an agreement that supports the United Nations Convention on Climate Change (UNFCCC) which is the main treaty on climate change to stabilize greenhouse gas concentrations in the atmosphere at levels that prevent interference with the climate system.

- ***United Nations Framework Convention on Climate Change (UNFCCC) (1992):*** The convention seeks to stabilize greenhouse gas concentration in the atmosphere at a level that would prevent interference with the climate system.
- ***Kyoto Protocol (1997):*** The protocol specifies principles for reducing emissions of greenhouse gases
- ***Global Environmental Facility***: This is a partnership for international Cooperation where 183 countries work together and with other Stakeholders to address global environmental issues.
- ***Protocol for the Protection of the Ozone Layer (Montreal Protocol) (1989):*** A protocol to the Vienna Convention is an international treaty designed to protect the ozone layer by phasing out substances that are responsible for the depletion of the ozone layer.
- ***India-Brazil-South Africa New Delhi Summit Declaration (2008):*** A trilateral development initiative between India, Brazil and South Africa to promote South-South cooperation and exchange on Sustainable development.
- ***Agenda 21:*** This is a non-binding voluntary implementation action plan of the united nations with regard to sustainable development.

The 2004 National Climate Change Response Strategy for South Africa (NCCRS) outlined the main framework for sustainable development, while also fulfilling the need to respond to climate change. It outlines broad issues that need to be addressed, and identifies specific interventions in affected sectors that should be implemented to address vulnerabilities to climate change (DEAT 2004). The 2011 National Climate Change Response White Paper (DEAT 2011) reinvigorated NCCRS in terms of the recognition of the developmental implications of climate change and its impact on the socio – economic fabric of South Africa, as well as anchor it into a participatory framework. It also has greater focus on adaptation measures and a greater acknowledgement of the role of vulnerable groups including women, children and the youth. It recognizes that climate change is a cross – cutting issue that requires integrated responses to development challenges, while at the same time emphasizing the lead role of DEAT. Finally, the policy framework calls for climate change responses to address disproportionate vulnerabilities and inequalities that many poor communities in the country experience. The National Environmental Management Act No.107 of 1998 provides the enabling framework for the government to meet its environmental responsibilities. The Act seeks to improve environmental management while at the same time, facilitating sustainable development and improving coordination and governance of environmental issues. It also provides the general framework and principles through which all environmental management and plans are formulated concerning the protection of the environment and its resources.

Effects and Causes of Climate Change

According to Earthline Africa / Oxfam (2009: 13) South Africa was responsible "for emitting almost 318 million tons of carbon dioxide in 2003". The country's dependency on coal-fired power stations has resulted in a yearly per capita emission rate of about 10 tons of carbon dioxide, 43 per cent higher than the global average. Although South Africa is still classified as a developing economy, its dependence on coal-driven energy sources and the energy intensity nature of the economy have resulted in ~an extremely high carbon emission level per unit of gross national product, compared to the rest of the world (Mqadi and Steynor 2005). The 'Country Studies Project' (IISD 2004; DEAT 2011) predicts that climate change will cause the following:

- Mean temperature increases in the range of between 1°C and 3°Cby the mid-21st century, with the highest increases in the most arid parts of the country;
- a broad reduction of rainfall in the range 5 percent - 10 percent has been predicted for the summer rainfall region;
- increased incidence of both drought and flood~, with prolonged dry spells being followed by intense storms;
- a marginal increase in early winter is predicted for the winter rainfall region of the country; and
- a rise in sea level is also predicted — perhaps by as much as 0.9m by 2100.

However, the country is already experiencing the early effects of global warming and climate variability. Average land and sea surface

temperatures have increased, sea level is rising, rainfall patterns have changed, and the intensity and frequency of extreme weather events such as snow, hail, forest fires, floods and storms have increased (DEAT 2008 2011) with resultant negative impacts for the populace.

Impact of Climate Change

Climate variability is already having significant effects in South Africa .The three major environmental consequences of climate variability are drought, floods and fires (DEAT 2011; DoST 2010).

Floods

Human settlements, formal and informal, low cost and up market are vulnerable to higher risk flooding due heavy rainfalls or coastal storm surges. In most formal housing areas storm water drainage is under siege, because the infrastructure was not designed for recurrent surge flood events. Heavy rains and strong winds trigger floods and excessive storm water run offs. In some instances where water drains are prone to blockages, the result is extensive flooding of houses and infrastructure with consequential damage to property and human life. Increased rainfall, especially in Western Cape, Mpumalanga, Limpopo, KwaZulu-Natal, Gauteng and Eastern Cape has in recent years resulted in massive flooding that has threatened large areas of these provinces. Human settlements along the coast, in informal settlements in urban areas, and marginal groups living in rural areas, have been identified as the most vulnerable to climate change (DEAT 2008 2011; Chikulo 2011).

However, it is the informal ("squatter") settlements and other low-cost housing estates that have borne the brunt of climate change (DEAT 2005b). As a legacy of Apartheid, most of these settlements are located on the periphery of urban areas, along flood plains and river banks with inadequate infrastructure. These settlements are areas that have witnessed phenomenal expansion due to inward migration from the rural areas. It is estimated that most of 27000 informal settlements in 70 of the biggest municipalities containing 1 085 000 households, with an estimated population of 3,560,353 are built below the flood line (StatSA 2001).

Extensive flooding caused by devastating storms and rain, leaves many dwellings in these settlements inhabitable and thus renders thousands of inhabitants homeless. The Cape Flats in the metropolitan Cape Town and the Jukskei River in Alexandra in the Greater Johannesburg City area have a high number of informal settlements that are prone to floods. In most instances, these settlements do not also have tarred roads and the unpaved dirt gravel roads easily wash away thereby reducing, easy access to these areas. The poor quality of dwellings also contributes to the vulnerability of most poor households and makes them susceptible to storm damage with several hundred houses being swept away every year. The poor structures are thus vulnerable to extreme weather conditions and are easily damaged or washed away during strong storms and floods (DEAT 2005b). This vulnerability coupled with the poor access to services not only leads to an inability to cope and recover from such events but to a loss of income and learning as some people cannot go to work or school. For the period 2000 to 2008 the estimated cost of flood related damage was R4.7 billion for floods; and just under R400 million for storms (DoWEA 2010: 20).

Air Pollution and Fires

Poor housing quality in informal settlements and poor townships exacerbates their vulnerability. About 19 per cent of the dwellings in South Africa have been classified as being of informal ("squatter") type or in poor state of disrepair, are constructed using various materials including wood and cardboard (DEAT 2005b; Killian et al. 2005). in addition, the burning of coal kerosene, liquid petroleum or wood for home cooking and heating, the abnormally high housing densities also predispose informal settlements to the frequent incidences of accidental large fires (Smith 2005). This hazard is recurrent in most of informal settlements with concomitant loss of life and property. Between 2000 to 2008, the estimated cost of fire related damages amounted to R1.7 billion (DoWE 2010: 20).

Human Health

With specific regard to human health, climate change provides additional threats that interact with and reinforce existing infectious

diseases (Madzwamuse 2010; DEAT 2011). It is estimated that South Africa is likely to be exposed to an increase in water and vector borne diseases, particularly malaria and schistosomiasis (bilharzia) due to the changing ecosystem. It is predicted that both malaria and schistosomiasis will extend to new areas where the diseases currently does not occur due to the extension of malaria-prone areas due to an increase in the length of summer and the alteration and expansion of the malaria habitat. As a consequence, the number of people at risk to malaria is likely to increase to a predicted 7.8 million people. This means that nearly 5.2 million people who do not currently reside in present day malaria risk areas will be at risk (Madzwamuse 2010: 13; DEAT 2011: 9). Indeed, official reports (DEAT 2009) indicate that unpredictable weather patterns and climate aberrations are a compounding factor that has significant impacts on the vulnerable sector of society, further aggravating human health (DoWE 2010: 11). Furthermore, climate variability also has the potential to worsen existing vulnerabilities such as HIV / Aids and TB (DEAT 2011: 18). In short, ill health is closely associated with aberrant weather patterns (both high and cold temperatures) and disasters. In most cases, the elderly and children with pre-existing ill health conditions, as well as those with poor socio-economic profile are most vulnerable (DEAT 2011: 122 -124).

It is estimated that 16 million South Africans rely on burning fuels for space heating, cooking and water heating (DEAT 2011). Such high reliance on polluting fuels, especially the use of paraffin, wood, coal and candles poses a health risk as they can result in high levels of respiratory illness, burns from fires, particularly amongst poorer households, Exposure to these dirty fuels is associated with a number of human health, and safety risks .The use coal, paraffin, wood or liquid petroleum as a fuel , to cook and heat the homes, – especially in poor households with poor ventilation, inefficient appliances, such as inefficient, smoky stoves for example, and lack of ceilings often lead to health implications through indoor air pollution and condensation.

In most cases it may result in high pollution such as carbon monoxide and other organic compounds in the living environment. Exposure to indoor pollution (IAP) results in several health complications: such as for example, respiratory diseases including chronic obstructive pulmonary disease, lung cancer, nasopharyngeal cancer, and tuberculosis and eye disease. Low birth weight and acute lower respiratory infections have also been recorded, particularly in children under the age of five (DEAT 2008, 2011; Madzwamuse 2010). Thus in most poor households with poor ventilation the use of such fuel leads to indoor air pollutant concentrations and their associated health impacts, and this is viewed to be the most persistent and significant local air pollution problem. Thus in the final analysis, it is the poor who are disproportionately affected by air pollution.

Livelihoods

Rising temperatures, reduced rainfall and water scarcity, as well as recurrent floods are also having a significant impact on the agricultural systems in South Africa. These impacts include reduction in the amount of available land suitable for both arable and pastoral agriculture, the reduction in the length of the growing season and a decrease in yields. Climate change is also likely to further reduce the contribution of agriculture to the country's GDP, which has been declining over the years. More significantly, reduced rainfall is negatively impacting on both large-scale agriculture, which relies on irrigation, and small-scale farmers and the rural poor who practice rain-fed agriculture. The far-reaching consequences of climate variability for national food security and the national economy can only be appreciated when one takes into account the fact that the majority of the poor (over 70%) not only live in rural areas but are dependent on subsistent farming (Madzwamunuse 2010, DEAT 2011). Consequently, due to climate variability, the natural resource base on which the poor in South Africa depend cannot provide a means of subsistence.

In other words, with regard to livelihoods, case studies conducted across South Africa reveal the extent to which environmental impacts, such as snow, hail and flooding have negatively impacted on community livelihoods. Intense and variable climatic events have caused loss of crops and livestock (DEAT 2005b). The impact of the erosion of livelihoods and food security among vulnerable communities has resulted in increased malnutrition with severe impact on children's physiology (DEAT 2005b).

Shifting Migration Patterns

Climate change and the resultant shocks and stress are a major driver of migration. Climate vulnerabilities and lack of opportunities are common push factors for increased migration .In South Africa **c**limate change has cast doubts over the viability of rain-fed farming as a livelihood strategy leading to rural – urban migration. The major impacts of the intensified climate variability on migration have been two-fold: national and international. At the national level, the decline in agricultural production and the general vulnerabilities and a lack of opportunities has resulted in increased migration to urban centers (DoST 2010). The result has been growing number of informal settlements on the periphery of major urban centres and overcrowding in existing ones (SAIRR 2010). However, although urban centers serve as attractive magnets for settlement options for migrants, they are subsequently met with the stark reality of high levels of unemployment and competition for limited resources. At the international level, South Africa has witnessed an influx of foreign nations into the country due to its generous refugee policy. South Africa is the only country in the region where refugees and asylum seekers have freedom of movement and a right to work (UNICEF 2011: 31). As a consequence, the country has witnessed an influx of foreign nationals, especially from Ethiopia, Mozambique and Zimbabwe).

The combined effect of both national and international migration has been twofold. First, local authorities cannot keep pace with the growth in demand for basic social services thereby failing to improve living conditions for the poor (COGTA 2009, SALGA 2009), leading to the "unending backlogs, which as a result undermine municipal performance" (SALGA 2009: 5). Second, in some instances, it has created friction with locals over competition for already scarce resources and social services resulting in conflict amongst the residents in informal settlements. Indeed, it can be safely assumed that it is the competition for employment, business opportunities and for resources such as housing, water, sanitation, as well as health facilities which is responsible for the spate of violent protests and xenophobic attacks on foreign nationals (CRAI 2008; HSRC 2008; Alexander 2010). Thus, it can be argued that in certain circumstances, shifting migration patterns which are the direct and indirect impacts of climate variability can lead to violence thus impacting on human security.

Delivery of Basic Social Services and Service Delivery Protests

In order to reduce the inherited backlogs of basic social services and alleviate poverty, the government has since 1994 sought to achieve universal access to basic social services in the whole country.

As Table 1 indicates significant in-roads have been made in providing access to basic services. Nonetheless, huge backlogs remain especially for households in rural areas and poor households in informal settlements in urban areas. Despite delivering 2, 8 million subsidized houses (RDP Houses) between 1994 and 2011, approximately 2.3 household remain inadequately housed, a further 1.2 million households in more than 2,500 informal settlements have inadequate access to basic services (SAIRR 2010). As a consequence, there has been an increasing disaffection with the rate, as well as the quality of social services provided by local authorities.

Table 1: Percentage number of household access to electricity, water and sanitation

Service	*2001*	*2011*
Electricity	51.1	84.6
Sanitation	51.9	60.16
Piped (Tap)Water	84.4	91.2
Refuse Removal	55.0	62.6

Source: StatSA, 2012

The result has been an increase in service delivery protests. Between 2004 and 2011an estimated 285 service delivery protests were reported (Karamoko and Jain 2011: 24) Furthermore, the spate of violent service delivery protests tend to occur predominantly in urban metro areas (HSRC 2008).In most instances the ritual of service protests takes the form of barricading access to roads, and streets to informal settlements and / or townships, the throwing of rocks at passing traffic and burning of tyres on the roads and burning municipal buildings such as clinics, libraries, as well as councillor's houses. Increasingly, however, these protests have also degenerated into a spate of concentrated vio-

lent xenophobic attacks on foreign Africans. For instance, the year 2008, witnessed an eruption of concentrated xenophobic violence against foreign Africans over a two-week period in at least 135 locations across the country. This resulted in at least 61 people killed and 100,000 people displaced and rendered homeless The violent xenophobic attacks were attributed mainly to competition between locals and immigrants for services such as housing, water, sanitation and health services together with employment and business opportunities amongst poor communities (CRAI 2008; HSRC 2008: 7; Alexander 2010). Xenophobic attacks on foreigners living in the informal settlements and townships, as noted above, have taken place in the resource constrained environments: thereby making foreign nationals –especially African residents and businesses owned by Pakistanis - become targets of the violent municipal service delivery protests (HSRC 2008: 7). Thus, xenophobia rears its ugly head mostly in the resource constrained informal settlements and poor townships although it is very rare in the rural areas.

Poverty and Inequality

Despite the achievement of significant service delivery milestones, little progress has been made on the central objective of reducing poverty and inequality. Between 1998 and 2009 the Human Poverty Index increased from 20 % to 25 %; while 49 percent of the population was classified as poor in 1994, in 2006 the figure dropped to 47.1 percent (StatSA 2008). Among the population groups, the incident of poverty is highest amongst Blacks with 54.8 percent, Colored with 34.2 percent, Indians 7.1 percent, and Whites 0.4 percent (StatSA 2008). Furthermore, in South Africa, the face of poverty is often female. It is estimated that 54.4% of poor people in South Africa are women – the equivalent of 11.9 million people (Earthline Africa 2011: 9). The continued social and economic exclusion of millions of South Africans is thus reflected in high levels of poverty and inequality.

Similarly, the unemployment rate is one of the highest in the world: the unemployment rate peaked to 31.2% in 2003, dropped to 23% in 2007 and then increased to 24.2 % at the end of 2009 (Presidency 2009).Consequently, the share of working-age people with employment (which includes the self-employed) rose from 39 percent to 42 percent, and the official unemployment rate fell from 30 percent to 26 percent (StatSA 2008: 26).The unemployment problem is compounded by the growing number of unemployed youth. It is estimated that 3.3 million 15 – to – 24 year olds do not go to school, work nor attend college (Chikulo 2011). Increasingly, it is an army of the unemployed youth who are to be found in the forefront of the violent delivery service protests taking place across the country.

There thus seems to be a link between perceptions of relative poverty, inequality, feeling of exclusion and marginalization and the spate of service delivery protests. It can thus be concluded that relative, rather than absolute, deprivation may be one of the primary underlying causes of the wave of violent service delivery protests. Consequently, the prevailing conditions of poverty and inequality exacerbate the risks and exposure of the poor to the impacts of climate variability and impacts on human security. As Kumssa and Jones (2010) have noted elsewhere, poverty and inequality may be responsible for the increasing violence in the country. Thus climate change compounds poverty and inequality leading to significant impacts on the vulnerable sector of the populace, further aggravating the depth of poverty and human insecurity.

CONCLUSION

Climate change in South Africa has had a profound wide-ranging impact on the marginalized communities and households. A significant proportion of South Africans, especially the poor, have to contend with poverty, a lack of basic social services and unemployment, which are being compounded by climate change. Climate variability has been of such a magnitude that in most impoverished communities, it has undermined their resilience making it impossible for them to recover by using their own resources. This situation further aggravates the depth of poverty, inequality and insecurity, as well as widening the gap between the rich and poor. The situation in South Africa is compounded by the fact that local authorities have juggle daunting development challenges inherited from the Apartheid regime with pressing climate change mitigation demands. However, with regard to legislative and policy frameworks, significant efforts have been made with respect to mitiga-

tion and adaptation concerning the effects of climate variability, as well as the alleviation of poverty in order to improve human security.

RECOMMENDATIONS

The main challenge facing the South African Government, is how to link the objectives of poverty alleviation policies with those of climate change priorities within a sustainable development framework. In order to achieve this goal, there is an urgent need to mainstream or integrate climate change adaptation with sustainable development policies in order to reduce poverty and increase the poor people's capacity to adapt or respond to climate change. Climate change adaptation should therefore be viewed as the key to poverty reduction. Consequently, any effective strategy should ultimately depend on the synergies between climate change adaptation and poverty alleviation. The government also needs to radically transform the economy, in order to stimulate inclusive growth which creates jobs, reduces inequality and minimizes instability in society. To this end, the government needs to leverage the talents and energies of the marginalized poor communities and the unemployed. The government should strive to create equitable prosperity, harness the energies and acknowledge the aspirations of the poor thereby facilitating inclusive growth and social stability. Inclusive sustainable development is therefore key to how the poor adapt to climate change. The poor need to be involved in the planning and decision making concerning climate change and development policies, as well as service delivery in their communities. As a result, empowering the poor to deal with climate change and improve their human security should entail drawing on their needs and knowledge. Finally, the government need to capacitate the local authorities to enable them to effectively deliver basic services to their communities.

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