Sustainable Energy Briefing 26: Evaluating the success of South Africa's Climate Change Adaptation

The recent failure of the 19th Conference of the Parties (COP 19) to the United Nations Framework Convention on Climate Change (UNFCCC) to reach any binding agreement on greenhouse gas emissions reductions render the challenge of maintaining global temperature rise below 2° C virtually impossible. The South African government, like all governments of the world, must then prepare for irreversible human caused climate change. These preparations and changes to cope with climate change impacts are called adaptation measures.

This Sustainable Energy Briefing outlines South Africa's unfolding climate change adaptation process and evaluates its success according to normative criteria of evaluation. Normative criteria seek to evaluate something according a standard which is prescribed by cultural or societal norms. Normative criteria assist in understanding what is going on rather than what a situation is. There are several reasons for using normative criteria for evaluation, the key one being that there is no quantitative means as yet by which to measure South Africa's climate change adaptation because the policy has not yet resulted in any concrete activities. Three adaptation developments happening in South Africa at the national level are analysed here: The National Climate Change Response, the Long Term Adaptation Scenarios and the Let's Respond Toolkit. The analysis shows the National Climate Change Response to be the most successful climate change adaptation development so far, but it is also the oldest and most supported policy intervention.

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I. Introduction

The effects of climate change are already evident in South Africa. This year, 2013, Gauteng is experiencing unprecedented violent storms and parts of the Free Sate and North West are gripped with drought. These changes in weather patterns over the long term will culminate in climate change and the country will increasingly experience erratic rainfall patterns leading to increased floods and drought, an increase in the incidence of violent storms and fires, and temperature rise. South Africa will have no choice but to fundamentally change its unsustainable path in order to protect its people and assets. The changes that South Africa will be forced to make in a changing environment will be climate change adaptation. The South African government has made some preliminary steps towards rolling out climate change adaptation, but these steps are mostly in the form of policy formulation, research and planning tools.

This briefing describes and evaluates three climate change adaptation developments in South Africa that have begun to shape the way in which climate change adaptation will occur in the country in the coming years. The first is the National Climate Change Response (NCCR) White Paper of 2011 which sets the background to all climate change related activities in South Africa. The second is the on-going Long Term Adaptation Scenarios (LTAS) Research Flagship Programme that was mandated by the NCCR White Paper and is concerned with understanding the long term socio-economic implications of climate change for various key sectors in South Africa under a range of climate change and development scenarios. The third is the "Let's Respond Toolkit" which has been designed in cooperation with various government departments to assist local governments in mainstreaming climate change adaptation planning into their Integrated Development Plans (IDP)s.

This Sustainable Energy Briefing will then evaluate the success of the climate change adaptation developments in South Africa according three normative criteria for successful adaptation-effectiveness, efficiency and legitimacy. These indicators are based on a framework designed for measuring successful climate change adaptation by Adger et al. (2005)[1]. These criteria for evaluation have further been designed to measure the success of climate change adaptation at different scales. In this instance the different scales are levels of governance. Measuring the success of climate change adaptation at different scales is critical because while an adaptation can be successful at one scale it may have an adverse impact on another scale, increasing the likelihood of maladaptation in the future.

II. Climate change adaptation and climate change vulnerability

Climate change adaptation has been defined differently by the various users of the term, especially

[1] Adger, N., Arnell, N., & Tompkins, E. (2005). "Successful adaptation to climate change across scales". Global Environmental Change. 15, 77–86.

from those originating from either the social or natural sciences. Definitions from the natural sciences focus more on the ability of natural systems to recover and cope with threats from climate change; while definitions from the social sciences consider the abilities of social and human systems to not only cope with climate change but also to continue with normal functioning. Adger et al. (2005, p. 78) provide a definition that overarches these two systems, which are after all interlinked, by describing climate change adaptation as the adjustments in ecological, social or economic systems in response to the observed or expected changes in climatic stimuli and their impacts so as to alleviate the effects and take advantage of new opportunities. Burton (1997, p. 187)[2] provides a suitable definition for climate change adaptation for this briefing, defining it as follows: "adaptation to climate is the process through which people reduce the adverse effects of climate on their health and well-being, and take advantage of the opportunities that their climatic environment provides".

There are different types of climate change adaptation. For example a climate change adaptation can be autonomous or forced, meaning that it can originate from a voluntary grassroots movement or that it can be imposed on a community by the government. Climate change adaptation can be reactive or it can work at building resilience, meaning that it can respond after disaster has hit or it can prepare the community to cope better with disaster in anticipation of disaster. Climate change adaptation is however always in reaction to a pending or experienced climate change related risk. The way in which communities will experience climate change is dependent on their climate change vulnerability. Climate change vulnerability results from a combination of community's sensitivity towards climate hazards such a drought and their social vulnerabilities such as poverty.

Worldwide there is no society which is not vulnerable to climate change in some way or the other. Yet, some human societies are more vulnerable than others. Why will a coastal community in Vietnam be less equipped to cope with the adverse impacts of climate change than a coastal community in the Netherlands? The answer is because the community in the Netherlands has better resources, more advanced technology, better disaster control mechanisms, stronger support systems, better communication channels, stronger governance, and so on. In short, the community in the Netherlands has a higher adaptive capacity than the coastal community in Vietnam. Adaptive capacity is usually deemed high when social vulnerability is low and vice versa. Climate change vulnerability can therefore be defined as a phenomenon which is rooted in social vulnerability but which is further impacted by institutional and economic dynamics. These institutional and economic dynamics are, however, dependent on the geographical location of communities as well as, more importantly, their sensitivity and exposure to climate change threats and impacts.

Climate change sensitivity is more pronounced when communities live within areas that are at high climate risk, such as in low-lying coastal areas, in areas of erratic rainfall, in flood plains, etc. When these risks are coupled with institutional and economic vulnerabilities such as weak governance, poor service delivery, poverty and unemployment; overall climate change vulnerability is considerably deepened. This relationship between the projected climate change threats, the sensitivity to those

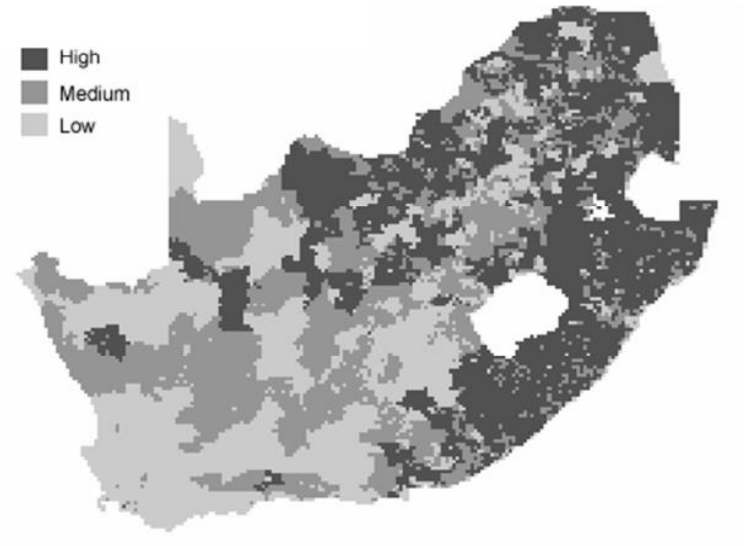
[2] Burton, I. (1997). Vulnerability and adaptive response in the context of climate and climate change. Climatic Change. 36, 185–96.

threats and the social vulnerabilities of communities is what leads Kates (2000)[3] to claim that climate change will most likely reinforce already existing inequalities and create new ones. In order to understand how climate change will impact on the already existing structural inequalities of South Africa it is necessary to have a broad understanding of the future impacts of climate change and of the sensitivities and exposure of local communities to these changes.

III. Climate change vulnerability in South Africa

A recent study by the Department of Rural Development and Land Reform (2013)[4] analysed the social vulnerability of South Africa to climate change. The study took into account access to basic services, the types of dwelling people live in, the age profile of the population, the Primary Health Care Utilization Rate of the population, severe malnutrition in children, income levels, unemployment, land tenure status and gender of head of household as indicators of social vulnerability which will be deepened by the environmental risk of climate change. Although these indicators do not cover the full range of social vulnerabilities that will contribute to climate change vulnerability, they provide a good indication of where the most severe climate change vulnerabilities in South Africa exist. Map 1 shows the areas in South Africa with the highest social vulnerability to climate change in South Africa (dark grey) because they experience multi-stressors which inhibit the abilities of communities to adapt. These areas mostly fall within rural and densely populated areas, many of which are former homelands.

Map 1: Social vulnerability to climate change in South Africa



Source: **(Department of Rural Development and Land Reform, 2013)**

[3] Kates, R.W. (2000). Cautionary tales: adaptation and the global poor. Climatic Change. 45, 5–17.

[4] The Department of Rural Development and Land Reform (2013). "Climate Change Risk and Vulnerability Assessment for Rural Human Settlements". Available online at: http://www.dla.gov.za/phocadownload/spatial_Planning_Information/Climate_Change/Latest_Risk_and_Vulnerability_july_2013_09072013.pdf

When socially vulnerable areas to climate change (seen in Map 1) are subject to climate change related environmental threats, overall climate change vulnerability is considerably deepened. South Africa is vulnerable to the climate change related threats of temperature rise, changes in precipitation patterns, sea-level rise and ocean acidification. These impacts will be most severely experienced in areas that are already environmentally degraded and where there are high levels of social vulnerability.

Temperature rise in South Africa is projected to be more severe inland than on the coastal areas in the future, and will be mostly evident during the winter months. The impacts of temperature rise will include, but will not be limited to, heat stress in people (in particular for the young and for the elderly), heat stress in livestock, an increase in pests and diseases, a higher evaporation rate leading to water shortages. Future rainfall changes are less easy to predict for the future because the historical rainfall upon which projections are based is more varied than temperature. None the less, it is projected that in the future there will be an increased drying in the western and north east parts of the country and that there is a possibility for an increase in rainfall in the east of the country. There is much evidence to suggest, however, that many parts of the country will be subject to more intense rainfall events in the future. Because South Africa is already a water stressed country, changes to the rainfall patterns is the most dangerous climate change threat for the country. A decrease in rainfall will lead to drought, food insecurity, human health problems and economic losses. An increase in rainfall and an increase in extreme rainfall events will lead to flooding, the destruction of assets, agricultural losses, economic losses and loss of human life. As the oceans absorb more Carbon Dioxide, waters are becoming more acidic leading to losses in marine life and marine ecosystems as well as devastating impacts for fishing livelihoods. Likewise, sea-level rise will threaten coastal infrastructure and coastal communities, alongside the dangerous impacts of storm surge (Department of Rural Development and Land Reform, 2013).

Climate change adaptation is critical in supporting communities to not only cope under the impacts of climate change, but to also continue to develop and thrive. Climate change adaptation in South Africa should move beyond responding to the physical impacts of climate change such as sea-level rise to focus on the interrelated features that lead to overall climate change vulnerability. Successful climate change adaptation should then address the current social vulnerabilities and environmental risks which are mostly felt by marginalized and vulnerable groups such as women, the poor, rural communities, children, the elderly and the unemployed.

IV. The National Climate Change Response Policy

The objective of the NCCR White Paper of 2011 is "to set(s) out South Africa's climate change response strategy to achieve the National Climate Change Response Objective in a manner consistent with the outlined principles". The NCCR focuses on the following strategic priorities: "risk reduction and management; mitigation actions with significant outcomes; sectoral responses; policy and

regulatory alignment; informed decision making and planning; integrated planning; technology research, development and innovation; facilitated behaviour change; behaviour change through choice; and resource mobilisation" (Department of Environmental Affairs, 2011, p.5)[5]. In doing so the NCCR outlines South Africa's international and domestic response framework to the global threat of climate change. The Policy document deals with climate change in terms of climate change mitigation and climate change adaptation, although sometimes climate change interventions can have both climate change mitigation and climate change adaptation outcomes. Such interventions include the development of renewable energy because while renewable energy reduces the Carbon Dioxide emissions caused from burning fossil fuels, it also has the potential to support communities in being less dependent on a centralized energy system and therefore will build resilience to climate change.

Section five of the NCCR deals with climate change adaptation. The section states that the overall approach to climate change adaptation in South Africa should have a regional focus because countries in the sub-Saharan region face similar climate change related vulnerabilities and similar environmental risks. The countries of sub-Saharan Africa are also subject to transboundary pollution and resource scarcity. Further, there is already considerable regional migration which is expected to increase as the impacts of climate change deepen already existing social inequalities. The NCCR therefore has adopted a climate change adaptation response that aims to reduce regional risk and vulnerability to climate change (DEA, 2011, p. 16).

The NCCR further adopts a climate change adaptation approach which is flexible and adaptive in itself in order for it to stay relevant in the event that the climate change projections do not materialize. Therefore the NCCR promotes that effective monitoring and evaluation mechanisms be put in place to ensure the continued monitoring of both the climate change impacts and the climate change adaptation interventions to maintain effectiveness. The NCCR further recognizes that climate change adaptation is a local phenomenon as this is where the impacts of climate change will experienced. The NCCR also notes that climate change adaptation offers co-benefits such as the creation of jobs and the restoration of degraded land.

Overall the NCCR states that the South African climate change adaptation policy should be integrated and coordinated, but driven by the following: "early warning and forecasting for disaster risk reduction, medium-term climate forecasting to identify potential resource challenges well in advance and long-term climate projections that define the range of future climate conditions". These guidelines must be supported by research, capacity building, integrated resource and development planning and technology development. To this end, government departments must develop sectoral climate change adaptation plans which are in line with the broader development plans of South Africa. A sub-committee of the Intergovernmental Committee on Climate Change (IGCCC) will ensure the mainstreaming of these sectoral climate change adaptation plans into broader sectoral plans. The climate change adaptation sector plans will result in a prioritization of climate change adaptation interventions and adaptation interventions.

[5] Department of Environmental Affairs. (2011). The National Climate Change Response White Paper. (Available on line at: http://www.info.gov.za/view/DownloadFileAction?id=152834). Accessed on 29th of October 2013.

The NCCR identified six key sectors that are critical in the climate change adaptation response. These are water; agriculture and commercial forestry; health; biodiversity and ecosystems; urban human settlements, rural human settlements and coastal human settlements; and disaster risk reduction and management.

V. The Long Term Adaptation Scenarios Flagship Programme

The Long Term Adaptation Scenarios (LTAS) Research Flagship Programme is the only near-term flagship programme outlined by the NCCR which deals specifically with climate change adaptation; although some of the other flagship programmes share climate change adaptation outcomes alongside their intended climate change mitigation outcomes. The LTAS research is further mandated by Outcome 10 of the Government Wide Monitoring and Evaluation System which stipulates that climate change impacts need to be identified and climate change adaptation frameworks integrated into national sectoral plans for the following twelve sectors by 2012: biodiversity, forestry, water, coastal management, agriculture, health, tourism, land and rural development, local government, fisheries, human settlements and business.

The LTAS research responds to the NCCR (paragraph 8.8[6]) which calls for the development of national and regional adaptation scenarios under a range of future climate projections and development pathways. This endeavor requires an assessment of the climate change impacts for key sectors and the socio-economic implications, in the context of the development objectives of these sectors and of South Africa as a whole. The LTAS process further aims to understand how the regional and international context will impact on South Africa's climate change adaptation response.

There are two phases to the LTAS process, the first phase was completed in June 2013 and it considered the following sectors: water, agriculture and forestry, human health, fisheries and biodiversity. The second LTAS phase will focus on human settlements (rural, urban and coastal) and disaster risk reduction and management. The LTAS process expects to provide the following outputs: socioeconomic quantification of impacts of climate change to a common set of climate change scenarios, identification of key adaptation responses and their effectiveness for each time frame, identification of gaps that require further research, development of integrated assessment approaches and cross-sectoral impacts, coherence in adaptation planning, regional climate change vulnerabilities and information products for decision makers (South African National Biodiversity Institute 2013).

VI. The "Let's Respond Toolkit"

Although the NCCR claims that provinces are required to develop climate change response strategies, it further stipulates, in Section 10.2.6, that local governments too have an important role to

[6] South African Biodiversity Institute. (2013). Long Term Adaptation Scenarios Research Flagship Programme (LTAS). Summary for Policy-Makers. (Available online at: http://www.sanbi.org/sites/default/files/documents/documents/ltas-phase-1summary-policy-makers06082013draft.pdf). Accessed on 29th of October 2013.

play in responding to climate change and therefore should develop their own climate change mitigation and adaptation plans (DEA, 2011, p. 36)[7]. The role of local governments is becoming increasingly recognized in environmental and climate change governance because it governs at the local level where the impacts of climate change will happen and where the resources in order to cope with those impacts will be deployed. Moreover, it is at the local level where poor environmental management is contributing to anthropogenic climate change. Local governments are more than well placed to respond to the impacts of climate change, in fact they have little choice. Around the globe, local governments are attempting to adopt sustainable development policies which are abreast with international trends and South African municipalities should be no exception. Local governments are further in a favourable position to lobby for climate change adaptation because they are experienced in management at the local level and thus know where the problems lie. It is the local area where ultimately international treaties are put into practice (Anshuman Khare et al., 2011, p. 228)[8].

Recognizing the potential of local government to develop efficient and effective climate change adaptation planning, the Department of Environmental Affairs (DEA), the Department of Cooperative Governance and Traditional Affairs (CoGTA), the South African Local Government Association (SALGA), with support from the German Development Cooperation (GIZ) developed the "Let's Respond Toolkit" as a tool to assist local governments to incorporate climate change adaptation and mitigation planning directly into their Integrated Development Plans (IDP)s. The "Let's Respond Toolkit' is a practical tool by which to support local municipalities in planning for sustainable and climate resilient development. The toolkit aims to incorporate climate change planning rather than start a whole new planning process. In a step by step process the toolkit guides local municipalities in recognizing local climate change risks and vulnerabilities for the sectors and communities under their management for the short, medium and long term. The toolkit also provides guidance for local municipalities to recognize the available opportunities to mitigate those risks. So far the toolkit has been piloted with five local municipalities in South Africa and many more municipalities are making plans to integrate climate change planning into their IDP planning. The extent to which IDP planning that has been incorporated with climate change adaptation planning by the toolkit has resulted in actual climate change adaptation activities is, however, largely as yet undocumented (DEA, 2013).

VII. Measuring successful climate change adaptation

Adger et al. (2005) provide normative evaluation criteria for evaluating the success of climate change adaptations at different scales. The criteria are deemed as an appropriate guideline in evaluating the climate change adaptations in South Africa because these climate change adaptation developments are occurring across different scales of governance. Although the climate change adaptation

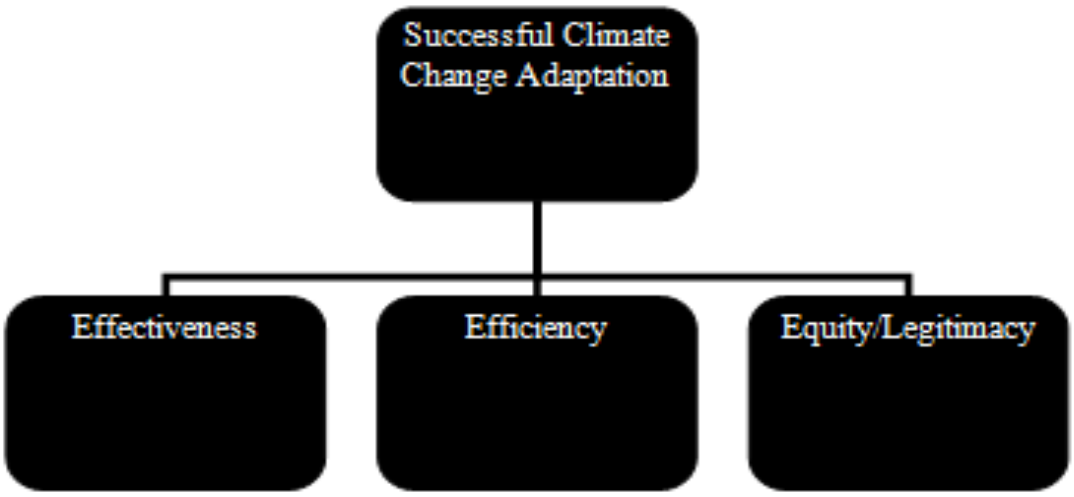
[7] Department of Environmental Affairs. (2013). Let's Respond. Integrating climate change risks and opportunities into municipal planning. (Available online at: https://www.environment.gov.za/sites/default/files/docs/lets_respond_toolkit_nccrp_workshop.pdf). Accessed on 29th of October 2013.

[8] Anshuman Khare, A., Beckman, T., & Crouse, N. (2011). Cities addressing climate change: Introducing a tripartite model for sustainable partnership, Sustainable Cities and Society. 1 (4), 227-235.

developments in South Africa have not yet become tangible climate change adaptation actions, they are still considered climate change adaptation because adaptation is also actions that enable groups or organizations to take climate change adaptation decisions.

When broadly considered, climate change adaptation is successful if it meets its required objectives. The same climate change adaptation may, however, be successful in one area but not in another. Therefore climate change adaptation can be successful on one scale but not on another. Adger et al. (2005) consider the concept of successful adaptation more narrowly by determining successful climate change adaptation by its effectiveness, efficiency, equity/ legitimacy; all of which are important in uncertain development pathways. These criteria are illustrated in Figure 1. Evaluating climate change adaptation is critical to ensure that the intervention does not make the climate change related threat to which it is responding worse by increasing sensitivity or vulnerability. In this case the adaptation would become maladaptive (Adger et al. 2005, p. 77).

Figure 1: Criteria for measuring successful climate change adaptation



***Source*: Adger et al. (2005)**

Effectiveness is defined by Adger et al. (2005, p. 81) as the capacity of a climate change adaptation to achieve its already determined objectives. In other words, did the climate change adaptation reduce the climate change related threat that it set out to? Effectiveness is a difficult criterion to measure because often there is a lack of clear indicators and because of the dependence of some indicators on other actors. Further, the effectiveness of an adaptation may depend on future social, environmental and economic conditions. Effectiveness can, however, be measured in terms of robustness to uncertainty and flexibility. There is always the risk that while a climate change adaptation may be effective at one level or in one area, it is actually decreasing effectiveness in others. Longer time frames may show a higher degree of effectiveness while larger spatial scales may reveal a lesser degree of effectiveness.

Adger et al. (2005, p. 82) define climate change adaptation efficiency as the comparison of economic

costs and benefits. An efficient climate change adaptation is one which yields sufficient outputs for its cost. Assessing the economic efficiency of an adaptation intervention requires that the distribution of the costs and benefits are considered, and that the costs and benefits of elements that do not have a market value are considered.

Although people have no choice but to adapt to climate change, climate change adaptations can still reach a certain level of legitimacy. The legitimacy of climate change adaptation can be enhanced by whose decisions they originate from and the fairness of the rules by which decisions are made. Adger et al. (2005, p.83) claim that equity in outcome for climate change adaptation is dependent on recognizing who wins and who loses from the adaptation outcome. Regarding climate change adaptation in this way often shows how, despite the basic premise of climate change adaptation, climate change adaptation often works to reinforce already existing inequalities. The legitimacy of decisions in climate change adaptation is affected by the distributions of power within the decision making organizations. Adger et al.(2005) define legitimacy in climate change adaptation as the extent to which the decisions made are deemed fair by the participants in decision making and by those affected by the decisions. Legitimacy can be gained and lost through the decision making and implementation process. Legitimacy is also scale dependent, while people may accept the climate change adaptation interventions of their own municipalities, the work of the national government in the same area may lack legitimacy. .

VIII. Analysis

In the following sections each of the three climate change adaptation developments will be measured according to the criteria for successful adaptation- effectiveness, efficiency and equity/legitimacy.

Effectiveness

The NCCR is effective in that it does lay out South Africa's response to its climate change adaptation which was its primary objective. It does so, however, in terms of six key sectors without including other critical sectors such as mining, industry and energy which are resource intensive activities and therefore sensitive to climatic changes. Therefore the NCCR does not lay out a comprehensive climate change adaptation framework for the country and cannot be robust to uncertainty and multi-sectoral impacts of climate change. Under the water sector, for example, the NCCR fails to acknowledge that mining pollution is devastating to water resources which are expected to deplete considerably in the future under a wide range of climate change scenarios. Nor, does the NCCR, acknowledge the increasingly huge amount of water required by the electricity sector which will increase as coal continues to contribute to the energy mix. The NCCR also fails to acknowledge water loss through ageing infrastructure. The NCCR is not robust to uncertainty because it does not consider that climate change may be a more urgent issue than the models predict and so does not outline targets and deadlines. This oversight was documented in Earthlife Africa's comments to the draft white paper in 2010.

The NCCR does maintain a flexible approach in most of the sectors that it considers by

acknowledging the need for further research to understand the impacts of climate change more clearly so that climate change adaptation responses can be continuously improved. The NCCR further advocates for the development of monitoring and evaluation systems for the measurement and improvement of climate change adaptation interventions. The NCCR is not flexible, however, because it does not consider alternatives to the current status quo. Currently the water policies of South Africa are inefficient in curbing water wastage and pollution. Therefore in order for climate change adaptation to be effective in the water sector the policies require a complete rethinking. The NCCR seeks to mainstream climate change into already existing water policy, rather than encourage new water policy which is prepared for water shortages as its primary objective. The NCCR was very clear that climate change adaptation responses should have a regional focus in cooperation with neighbouring states, this principle has however largely been left out in climate change adaptation activities that are suggested to the 6 sectors.

The primary objective of the LTAS Flagship Programme is to provide research into the development of national climate change sectoral adaptation scenarios under a range of future climate change projections and development pathways. This research was supposed to be completed by the end of 2012 but at the time of writing (late 2013) has only started its second phase. In terms of time frames, the LTAS Research Flagship Programme is ineffective. Further, although the LTAS Research Programme responds to paragraph 8.8 of the NCCR, it overlaps with section 10.1.3 which calls for the development of sectoral adaptation plans by the responsible government departments of the sectors outlined in the NCCR. These two processes therefore overlap and have resulted in the LTAS repeating work already underway within government departments. The LTAS is further ineffective in that it is researching the socio-economic implications of climate change into only the sectors highlighted in the NCCR and not into other critical sectors such as energy, mining and education. Likewise, this gap reduces the robustness of the LTAS process to uncertainty. The uncertainty that faces the energy sector will most likely have far reaching implications for all other sectors. The LTAS is also not increasing robustness to uncertainty because its resultant sectoral recommendations have hardly changed since the original sector recommendations in the NCCR. Perhaps the LTAS is however, more flexible in that it does argue for a policy "review" by the government departments like the Department of Water Affairs (DWA) and for more effective data capturing for use in more efficient monitoring and evaluations systems. Yet still the LTAS looks to future research for ensuing successful adaptation in the water sector without tackling the major current water problems which will be exacerbated in the future.

The purpose of the "Let's Respond Toolkit" was to develop a support tool by which local governments can incorporate climate change mitigation and adaptation planning into their Integrated Development Planning (IDP). The "Let's Respond Toolkit" has only recently been released and there is limited available information on how well the toolkit has been taken up by municipalities, although the toolkit was piloted with 5 municipalities. There has, however, been an increase of municipalities seeking consultants to assist them in mainstreaming the "Lets Respond Toolkit" with their IDPs. On the one hand the "Let's Respond Toolkit' is effective in that the call for consultants is showing that the tool is being taken up, but on the other hand the call for consultants is showing that municipalities may not have the capacity to develop their own climate change adaptation planning or are already too

overburdened by other responsibilities. If municipalities are overburdened then a more effective climate change response would be to solve the development problems that they currently face, which is also climate change resilience building, rather than attempt to solve similar problems under new regimes. The "Let's Respond Toolkit" is robust to uncertainty in that it leads municipal leaders through a step-by-step process covering all the basics of climate change vulnerability and good climate change governance. However, as it is only a toolkit it cannot substitute climate change mitigation and adaptation skills at the local level and may actually oversimplify the problems and the impacts that solutions will have at other scales, thereby leading to maladaptation. The "Let's Respond Toolkit" is inflexible because it does not allow municipalities to deal with climate change in other ways except through the IDP process, which is a planning system not without fault.

Efficiency

The general price of policy development in South Africa is around R 3 million which includes consultant fees, stakeholder engagement workshops and Project Steering Meetings. Despite the enormous price tag attached to policy development in South Africa, the policy development process is becoming increasingly less participatory, which is a frequent complaint from local communities. The benefits of the NCCR are that a framework for climate adaptation planning for South Africa was defined which then provides structure and coherence to all other activities that follow. Other benefits include that the interlinakges between climate change mitigation and adaptation became clearer as did the cross-cutting nature of climate change for a wide range of stakeholders. Given the amount of investment in the policy development process it may have been more efficient to invest in separate climate change mitigation and climate change adaptation policy papers. In doing so neither climate change mitigation nor climate change adaptation policy would appear as being more critical than the other but rather as two separate interrelated processes deserving equal attention. Furthermore, most of the funding arrangements within the NCCR focus on climate change mitigation already placing climate change adaptation in a secondary position.

The NCCR mostly provides strategic direction to national government departments. The roles of provincial departments and local municipalities are barely mentioned. Although the importance of community vulnerability was discussed, the ways in which communities can leverage assistance through bottom up mechanisms were not. Further the role of the private sector in climate change adaptation and possible partnerships between national governments and the private sector was also insufficiently explored. Therefore the NCCR was successful in providing national departments with strategic guidance but unsuccessful in providing direction to other important role players.

The LTAS Research Flagship is being implemented by the South African National Biodiversity Institute (SANBI) but is commissioned by DEA and funded by the GIZ. The benefits of the LTAS Research will be revealed in time once the second phase is complete, but the end of the first round has resulted in a summary for policy makers that describes how climate change will impact on sectors and makes recommendations for adaptation strategies. These recommendations however are not very different from those produced in the NCCR and in other sectoral climate change adaptation plans. It would appear then that the research will not hugely benefit decision makers. The LTAS process has drawn together a wide range of contributors and consolidated a considerable amount of

research on the topic of climate change adaptation. One of the most noteworthy benefits of the LTAS process has been the involvement of the National Treasury and their analysis of the socio-economic implications of climate change on various sectors, but the findings are not yet available to the public. This knowledge will useful for a wide range of stakeholders. Where the LTAS process was able to reduce the confusion of roles between the required sectoral climate change responses in the NCCR and the LTAS research, more parties benefitted because of knowledge sharing and the building on current research rather than the remaking of it. But no benefits will arise from sectors which are uncoordinated by the LTAS. There have been instances where national government departments have been unaware of the LTAS process even though they are developing their sectoral climate change responses. Mostly, the LTAS has reproduced work which is currently being independently undertaken by the sectors.

The "Let's Respond Toolkit" is a collaborative effort between various government departments but has also been funded by the GIZ. The benefits of the toolkit are a simple and practical methodology for local governments to determine their vulnerabilities and design climate change adaptation interventions that respond directly to those vulnerabilities. The tool is designed especially to assist those local municipalities that suffer a lack of skills and capacity. However, understanding climate vulnerability is a more complex process than the "Let's Respond Toolkit" suggests because of the interlinkages between so many environmental features that either contribute to vulnerability or to resilience. The "Let's Respond Toolkit" therefore may disadvantage local municipalities by oversimplifying the issue and encouraging maladaptation. Local government decision makers and local governments are meant to be the beneficiaries of this process. But it is yet to be seen how many local governments will use the tool in developing their climate change adaptation plans and how useful these local governments will find it. Through passing the responsibility for climate change adaptation to local governments, the national government is benefitting although local government is well placed to deal with climate change adaptation.

Equity/Legitimacy

In 2005 over 600 representatives from government, academic and research institutions and civil society met at the "Climate Action Now" conference and agreed that climate change was a reality and that the country needed a strategy in order to meet its commitments to the UNFCCC. "Climate Action Now" culminated in the Midrand Plan of Action which included a participatory climate change policy development process. The NCCR was developed from the 3-6 March 2009 by over 900 participants who contributed to the policy development online. Some of the areas of consensus were that climate change adaptation planning needed to be incorporated into development planning, a balance of climate change mitigation and adaptation was necessary and that it was necessary to build resilience at the local level. The subsequent National Climate Change Response Green Paper was published in 2010 for public comment. A website was even established which provided all the relevant documentation and enabled interested parties to post comments and keep track of other comments. Policy research was also conducted to inform the workshops and the National Economic and Development and Labour Council (NEDLAC) was consulted. DEA conducted many bilateral engagements on the policy and presented it at various forums and conferences. The draft policy was presented at public hearings with parliament for a period of three weeks. Over 4000 comments were

captured on the database during the consultation period. The comments were reviewed by the Intergovernmental Committee on Climate Change (IGCCC) in 2011 during a retreat which resulted in a draft White Paper which again went out for public comment. The White Paper was completed in July 2011 but high level engagement on the policy continued. The White paper was finally approved by Cabinet and published in October 2011[9]. The NCCR White paper does represent a fair decision making process, however the use of a website for stakeholder comments immediately marginalizes some stakeholders from the process because not all interested parties have access to the internet in South Africa. The fact that the comments made by Earthlife Africa Jhb to the policy paper were hardly taken up further subtracts from the fairness of the NCCR.

Fair decision making process in the LTAS Flagship Research is less easy to determine as it is not yet complete. Participation in the LTAS has happened at a fairly high level because those involved included government departments, researchers, climate change scientists, economists from the National Treasury amongst others. Other interested and affected parties have been somewhat excluded from the process. The LTAS has been criticized for not inviting a wider range of stakeholders to workshops and sessions and because the LTAS is based in Cape Town it is difficult for many stakeholders to attend. Those on the LTAS mailing list were however regularly informed on updates and were given opportunities to comment on the Technical Report for Phase 1.

There is little information on the participation of local municipalities in the development of the "Lets Respond Toolkit". If participation in the development of the toolkit was low it is concerning because local governments are the most knowledgeable on planning process issues at the local government level. The rollout of the toolkit did however begin with several introductory workshops coordinated by SALGA. During these workshops several actors working in the local governance space shared the work that they had been doing with local governments. Training on the toolkit was also provided at the SALGA head offices in Pretoria, but it was poorly attended by municipalities. The workshop was intended to serve as a platform for learning, experience sharing and knowledge exchange that would then contribute to the national roll out of the toolkit. But this training workshop happened only after the "Lets Respond Toolkit" had been developed therefore impacting negatively on the fairness of decision making.

The National Climate Change Response fared well in terms of effectiveness, efficiency and fairness because many of the interventions identified in the NCCR are being realized. Also, the NCCR was developed in a consultative fashion. The NCCR could have been more effective in its use of resources by developing separate national policies for climate change mitigation and adaptation. The Long Term Adaptation Research did not fare well in terms of effectiveness, efficiency and fairness. The project is however incomplete. The LTAS has been delayed and therefore is not meeting the climate change adaptation targets it set out to. Moreover, the LTAS research appears to be repeating climate change adaptation research already happening in various sectors. The LTAS research process has also happened at a fairly high level and a more participatory research approach may have deemed

[9] Parliamentary Monitoring Group. 2011. National Climate Change Response Policy: Department of Environmental Affairs Briefing. (Available online at: http://www.pmg.org.za/report/20111101-department-environmental-affairs-national-climate-change-policy-%E2%80%93-whi). Accessed on the 29th of October 2011).

the work more legitimate. The Let's Respond Toolkit has been developed to assist local municipalities in their climate change adaptation planning and therefore will be a useful tool in solving climate change adaptation challenges at the local level where these challenges are most understood. The toolkit may, however, oversimplify climate change adaptation challenges and may place a heavy burden on municipalities to undertake more work while other local development challenges remain unsolved. The uptake and success of the "Let's Respond Toolkit" will be revealed in time.

IX. Concluding Remarks

The recently released International Panel on Climate Changes (IPCC) 5th Assessment has once again concurred that anthropogenic climate change is a global reality. Moreover, normal citizens are noticing changes in their local climate and weather patterns. As the UNFCCC and Kyoto Protocol battle to keep global greenhouse gas emissions under a level that will prevent dangerous climate change, it is becoming more evident that climate change mitigation efforts have been feeble and that climate change adaptation is now a necessity. Climate change adaptation is a serious issue because those who are the most vulnerable to climate change in society are generally those who have contributed the least to it.

In South Africa the most vulnerable groups to climate change include groups like rural women, children, the elderly, subsistence farmers and the urban poor. Successful climate change adaptation would be adaptation that reduces the climate change vulnerability that these people face. South Africa has embarked on a planning process for climate change adaptation and this briefing has considered three of these. Firstly the National Climate Change Response, secondly the Long Term Adaptation Scenarios Research and thirdly the "Let's Respond Toolkit". None of these developments have as yet resulted in tangible projects on the ground and so cannot be measured in terms of their outcomes. Therefore a normative framework has been applied for the measurement of success making use of effectiveness, efficiency and legitimacy as criteria. The NCCR fared well in terms of all three criteria for successful climate change adaptation, although its effectiveness is debatable. The Let's Respond Toolkit is a strong idea with great promise but its overall success will be revealed in time. The LTAS project has revealed the least in terms of effectiveness, efficiency and fairness; although the process is not yet complete. The research has happened at a fairly high level and its contribution to the growing body of knowledge on climate change vulnerability and climate change adaptation in South Africa should be more thoroughly considered.

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