South Africa

Response to request for submissions from Parties and organisations on adaptation approaches, strategies, practices and technologies for adaptation

A. Mandate

1. The SBSTA invited Parties and relevant organizations to provide structured submissions, by 15 May 2007, on adaptation approaches, strategies, practices and technologies for adaptation at the regional, national and local levels in different sectors, as well as on experiences, needs and concerns. It requested the secretariat to develop the structure for these submissions and to disseminate it to Parties by 20 January 2007 (FCCC/SBSTA/2006/11, paragraph 56).

B. Preamble

South Africa welcomes the opportunity to provide inputs to this important information gathering process, and looks forward to pursuing a global integration of this information that will allow a clear identification of the extent of individual country commitment to adapting to climate change.

We note that our submission outlines both real investment in accordance with the requirements of Articles 10 d), 10 e), 13.4 c) of the Kyoto Protocol, and Articles 3.4, 4 f), 4 g), 4 h), 4 i), 5, 6, 12.1 c), and identifies key areas which are under consideration.

Accordingly, we note that these submissions are very likely, as ours does here, to identify many opportunities for enhanced actions identified as “under consideration” that may benefit from additional funding sources in accordance with the South African view on the “360° approach” to adaptation.

We strongly agree that “many adaptation actions by their nature are very cross-cutting as they seek to enhance adaptive capacities and reduce vulnerabilities in a number of related sectors and communities” but note that this should not distract from the very real need for funding such actions in a way that is consistent with the spirit and intent of the UNFCCC.

We also note that several large scale initiatives are currently being put in place by various South African agencies to deal with current climate variability and environmental monitoring – these include high cost, high technology approaches such as Doppler radar techniques to quantify and monitor extreme rainfall events, and remote sensing approaches from space, such as locally developed high resolution camera techniques, currently due for launch.

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14.05.2007

Type of adaptation action[1]	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns/ Barriers	Experiences/ Lesson learned	References i.e. publications, websites etc.
Scope of adaptation action ***Regional level***						
Approaches/ strategies	Landcare South Africa: Optimising productivity and sustainability of natural resources so as to result in greater productivity, food security, job creation and better quality of life for all	Under implementation	Political buy-in at national and local level Sufficient funding and good governance structures Stakeholder involvement	Funding availability and sustainability	Sustainable development principles provide support co-benefits for climate change adaptation objectives	http://www.nda.agric.za/docs/Landcarepage/landcare.htm
Approaches/	Working for water:	Under	Political buy-in at	Funding	Sustainable	http://www.dwaf.gov.za/wfw/

[1] Please be aware of the degree of adaptation within activities:

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- Some activities include a component of climate change adaptation, e.g. infrastructure replacement incorporating higher flood standards
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strategies	Alien plant removal program to enhance water yield from natural catchments and landscapes	implementation	national and local level Sufficient funding and good governance structures Stakeholder involvement	availability and sustainability	development principles provide support and co-benefits for climate change adaptation objectives	
Approaches/ strategies	Working for wetlands: Producing sustainable environmental outcomes, using implementation models that simultaneously contribute to the employment creation and skills transfer objectives of government's Expanded Public Works Programme	Under implementation	Political buy-in at national and local level Sufficient funding and good governance structures Stakeholder involvement	Funding availability and sustainability	Sustainable development principles provide support and co-benefits for climate change adaptation objectives	http://www.sanbi.org/research/wetlandprog.htm
Approaches/ strategies	Working on fire: Managing wildfire for sustainable development outcomes	Under implementation	Political buy-in at national and local level Sufficient funding and good governance structures Stakeholder involvemen	Funding availability and sustainability	Sustainable development principles provide support and co-benefits for climate change adaptation objectives	Val Charlton, Advocacy and Awareness Co-ordinator, Working on Fire Programme – + 27 (0) 82 378 9056 **val**@wofire.co.za

Approaches/ strategies	Climate Change R and D strategy *(initiative of the Department of Science and Technology)*	Under consideration	Political buy-in at national and local level Sufficient funding and good governance structures Stakeholder involvement	Funding availability and sustainability		
Approaches/ strategies	SAEON: South African Ecological Observatory Network	Under implementation	Political buy-in, sufficient funding and good governance structures, regional co-ordination and scientific capacity	Funding availability and sustainability		Dr Johan Pauw 211 Skinner Street PO Box 1758 0001 Pretoria www.saeon.ac.za

National level						
Approaches/ strategies	Weather Research and Information Programme	Network of stations needs to be expanded and all stations need cohesive and consistent monitoring and reporting – the expansion is under consideration	Budget (estimated at 500k per annum over 3 years) Capacity Established channels for communicating weather information	No extra barriers identified		www.wc-climatechange-response.org.za : A Climate Change Strategy and Action Plan for the Western Cape version 6 Midgley, G.F., Chapman, R.A., Hewitson, B., Johnston, P., De Wit, M., Ziervogel, G., Mukheibir, P., van Niekerk, L., Tadross, M., van Wilgen, B.W., Kgope, B., Morant, P.D., Theron, A., Scholes, R.J., Forsyth, G.G. (2005) A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-economic Effects of Climate Change in the Western Cape. CSIR Report No. ENV-S-C 2005-073.
Practices	Improved land use management and related agricultural practices	Current research in segments – e.g. sustainable agriculture practices; programme under consideration	Capacity (human) – e.g. through strengthening of extension services in agriculture Training, education and awareness – particularly of land owners and farmers	Farmers are cash strapped and argue that the costs of improved land use (and resource) management are prohibitive – for example improved irrigation to improve efficiency is an expensive technology switch for many farmers who do not have the capital. Mulching is considered labour intensive and therefore costly		www.wc-climatechange-response.org.za : A Climate Change Strategy and Action Plan for the Western Cape version 6 Midgley, G.F., Chapman, R.A., Hewitson, B., Johnston, P., De Wit, M., Ziervogel, G., Mukheibir, P., van Niekerk, L., Tadross, M., van Wilgen, B.W., Kgope, B., Morant, P.D., Theron, A., Scholes, R.J., Forsyth, G.G. (2005) A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-economic Effects of Climate Change in the Western Cape. CSIR Report No. ENV-S-C 2005-073.

Approaches/ strategies	Integrate climate risks into development planning and approval processes	Being considered	Political 'buy-in' Guidelines developed for evaluating climate risks when considering development plans and approvals	Development planners and officials in development planning approvals are resistant to changes in their procedures Incorporating this approach into existing legislation is time consuming and costly – ideally effected without	n/a	www.wc-climatechange-response.org.za : A Climate Change Strategy and Action Plan for the Western Cape version 6 Midgley, G.F., Chapman, R.A., Hewitson, B., Johnston, P., De Wit, M., Ziervogel, G., Mukheibir, P., van Niekerk, L., Tadross, M., van Wilgen, B.W., Kgope, B., Morant, P.D., Theron, A., Scholes, R.J., Forsyth, G.G. (2005) A Status Quo, Vulnerability and Adaptation Assessment of the Physical and Socio-economic Effects of Climate Change in the Western Cape. CSIR Report No. ENV-S-C 2005-073.
Approaches/ strategies	Map the 1 in 50 year floodline and use and disseminate information for development planning and related decisions	Being considered	Budget and capacity			www.wc-climatechange-response.org.za : A Climate Change Strategy and Action Plan for the Western Cape version 6
Approaches/ strategies	Strengthen and focus socio-economic data about vulnerable communities; develop scenarios	Being considered – community level data is to be available in the short term that can feed into scenarios	Quality community level data			www.wc-climatechange-response.org.za : A Climate Change Strategy and Action Plan for the Western Cape version 6
Local (community) level						
Approaches/ strategies	EThekwini Municipality: Climatic Future for Durban: *Amendment of Spatial Development*	Under consideration	Cost/benefit studies required to increase motivation power of the activity	Benefits of doing so not explicitly visible enough.	Improved economic arguments required	Hounsome, R. and Iyer, K. 2006. EThekwini Municipality: Climatic Future for Durban: Phase II Headline Climate Change Adaptation Strategy. CSIR, Durban.

	Plans (SDPs) to accommodate CC impacts					
Approaches/ strategies	Adapting to multiple stressors of climate, water and health in Sekhukhune district, Limpopo Province, South Africa	Under development	Understanding of the role of climate variability impacts on water resources on water availability for agriculture, industry and domestic use	Sector-specific approaches reduce the ability to see how climate impacts on multiple stressors, requiring a holistic response.	Climate change cannot be emphasized as a primary topic with stakeholders on the ground, but rather the primary stressors experienced by stakeholders should be linked to climate variability and change.	Adapting to climate, water and health stresses: insights from Sekhukhune, South Africa / Gina Ziervogel, Anna Taylor, Frank Thomalla, Takeshi Takama and Claire Quinn. – SEI, 2006. – 61 pp. – ISBN 978 91 976022 1 1 http://www.sei.se/editable/pages/sections/policy/SEI_Ziervogel%20et%20al_SAfrica_2006.pdf

Sectoral level[2]						
Agriculture						
Type of adaptation action[3]	**Title of adaptation action, including projects**	**Status of adaptation action** - ongoing - under implementation - under development - under consideration	**Needs in order to successfully implement the adaptation action**	**Concerns/ Barriers**	**Experiences/ Lesson learned**	**References** i.e. publications, websites etc.
Approaches/ Strategies	Desert Margins Program: Halt the degradation of South Africa's drylands, particularly its biodiversity, soils and carbon stocks, by sharing sustainable practices and strengthening human capacities.	Under implementation				Prof Klaus Kellner DMP-National Coordinator School of Environmental Sciences and Development North-West University (Potchefstroomcampus) Potchefstroom, 2520 E-mail: plbkk@puk.ac.za or Mrs Hestelle Stoppel DMP NCU Tel/Fax: (018) 299 2509

[2] The sectors below are given as examples. Please provide information on any other sectors which you consider important and have examples to share.

[3] Please be aware of the degree of adaptation within activities:

- Some activities are undertaken specifically to adapt to climate change, e.g. increased water storage capacity, development of new crop varieties.
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Approaches/ Strategies	Mitigation and adaptation options for agricultural production *University of Kwazulu-Natal, funded by Department of Agriculture: South African Atlas of climate change impacts on the agricultural sector*	Under development	State of the art regional climate models, downscaled, especially representing extreme events State of the art hydrological and mechanistic crop yield models Fine scale climate and soils data surfaces	High end skills needed to maintain capacity in this field, a lack of sufficient recruitment of young scientists to replace an ageing scientific skills base	Work of this nature requires long term commitment, job security and continuity. High level of competition for competent staff from other job markets.	
Technologies	Environmental Stress Tolerance Program, University of Cape Town Genetic modification program to increase drought tolerance in crops	Under development	High end skills in genetic research, associated high level of funding for equipment.	Long lead time to implementation		http://web.uct.ac.za/depts/plantstress/people.htm publications: http://web.uct.ac.za/depts/plantstress/papers.htm
Technologies	Drought mapping: *Department of Agriculture: Drought mapping and identification of drought prone areas using coarse resolution satellite imagery*	Under consideration	Skilled staff in satellite image analysis and spatial data anlaysis, Funding	Continuity of skilled staff	High level of competition for competent staff from other job markets.	
Water resources						

Approaches/ Strategies	EThekwini Municipality: Climatic Future for Durban *Implement water recycling and demand management practises*	Under consideration	Cost/benefit studies required. Further research on resilience of water supply systems, including possible increasing drought duration and intensity possible with CC, combined with rapid rural-urban migration (often made worse during times of extreme environmental stress such as could happen with very severe drought.	Full cost of water capture, storage and delivery is not explicit. This activity then competes against a partially subsidised public good. Climate change has not been explicitly catered for in water supply and sanitation services.	Adaptation co-benefits to supply-side management	Hounsome, R. and Iyer, K. 2006. EThekwini Municipality: Climatic Future for Durban: Phase II Headline Climate Change Adaptation Strategy. CSIR, Durban.
Approaches/ strategies	Integrated Water Supply and Infrastructure Management Programme for the Western Cape, that incorporates: *Use less water approach* Conserve water Design farms, industrial activities, buildings and	Under consideration	Appropriate institutional arrangements at a national, provincial and local authority level Budget allocation An adopted water management policy and plan for the Western Cape with an associated implementation	Existing institutional arrangements are not conducive; water is managed by the Department of Water Affairs and Forestry at a national level and does not have a provincial line function. The Western Cape has water supply	Institutional arrangements are key, as is a cross sectoral approach to an integrated water management programme. Sectors should include agriculture, water, industry, local government and housing	

	community developments to use less water Use more efficient irrigation systems and appliances *Recycle* Industrial process recycling Wastewater treatment plants and use of recycled water Drive rainwater capture at a domestic level *Improve system and reserve productivity* Repair leaks and minimise UAW- *reduce water losses by 15% by 2014* Use appropriate water quality for relevant purpose Strengthen against incidence of 1:100 year drought *Develop back up supply* Manage		mandate Public awareness and education Political buy-in	issues that pertain to the province and not the entire country. The revised regulatory framework has been designed but is not fully implemented (with authority for allocations and catchment management devolving to the Catchment Management Agencies (CMA), some of which have not yet been implemented. Water tariffs do not reflect the scarcity of the resource and SA water is amongst the cheapest in the world – little incentive to conserve Conflict over the resource between sectors and communities		

	catchment areas carefully and sustainably *so as to increase yields of existing resources* Build small or large scale treatment plants including desalination – particularly as back up supply					
Approaches/ Strategies	Managing climate change risk for agriculture and water resources *DFID/IDRC project on adapting to climate change in the Berg River Catchment, western Cape*	Approved – not yet begun	Understanding of relative importance and value of water within various sectors	Access to relevant information		
Practices	Integrating climate scenarios into hydrological and economic models for application by Water resource managers *DFID/IDRC project on adapting to*	Approved – not yet begun	Post doc researcher and training opportunities	Computational skill		

	climate change in the Berg River Catchment, western Cape					
Technologies	Further development of BERGSIM model *DFID/IDRC project on adapting to climate change in the Berg River Catchment, western Cape*	Approved – not yet begun	Downscaled scenarios and understanding of model integration	Computational resources		
Approaches/ Strategies	Climate information for water resource management *Water research Commision of South Africa*	Ongoing	Support for information dissemination of seasonal forecast information	Limited understanding in how climate information can be applied in water management strategies	People are more likely to use climate information when they have engaged with providers who explain potential information uses	www.c4w.org.za
Technologies	Climate information for water resource management *Water research Commision of South Africa*	Ongoing	Seasonal forecast information platform	Format and nature of forecasts needs to be more clearly explained	Some diagrammatic representations are easier to understand than others	www.c4w.org.za

Health						
Approaches/ Strategies	EThekwini Municipality: Climatic Future for Durban *Research underway into modelling climate change and impacts on disease vectors, esp. malaria*	Ongoing	Education programmes directed at public response. Security of electricity supply needs to be strengthened against extreme climate conditions – maintenance of cold chain, refrigeration and air conditioning necessary during heat waves. Research into effectiveness of management interventions in malaria risks, spraying programmes and environmental impacts of these.	Current research programmes are not deep enough and need to be strengthened. Funding is an issue. Capacity constraints are evident in the public health service regarding development of preparedness regarding expanding populations (rural-urban migration) and heat stress, for example.		Hounsome, R. and Iyer, K. 2006. EThekwini Municipality: Climatic Future for Durban: Phase II Headline Climate Change Adaptation Strategy. CSIR, Durban.
Coastal zones (settlements)						
Approaches/ Strategies	Revision of Spatial Development Framwork (SDF) to outline hazardous areas and re-zone accordingly for disaster avoidance	Under consideration	Political will and capacity to implement. Probably needs further motivation using cost benefit analysis	Direct effects not evident, resulting in lower priority ranking (somewhat speculative assessment)		Hounsome, R. and Iyer, K. 2006. EThekwini Municipality: Climatic Future for Durban: Phase II Headline Climate Change Adaptation Strategy. CSIR, Durban.

Practices	Set-back lines restrict coastal development. Caters for a 0.3-0.5m sea-level rise over the next 50 years and 1:50 year storm	Implemented	Significant concern in that a research programme conducted by local research institutions, using radar for real-time monitoring of rainfall over city catchments, has now come to an end. This does not seem to be a priority of the municipality. Political will to fund this is required.	Continued pressure to ease development restrictions.	A large storm in March 2007, a rare combination of equinox high tides and cyclone-induced heavy seas caused much damage to coastal infrastructure and property served as a timely lesson.	Theron, A K (2003). Setback line for the coastal zone: Cave Rock to Msimbazi River Mouth. CSIR Report ENV-S-C 2003-112. Environmentek, Stellenbosch. pp 44.

Others (please provide information about other relevant sectors) *Biodiversity*						
Type of adaptation action[4]	**Title of adaptation action, including projects**	**Status of adaptation action** **- ongoing** **- under implementation** **- under development** **- under consideration**	**Needs in order to successfully implement the adaptation action**	**Concerns/ Barriers**	**Experiences/ Lesson learned**	**References** **i.e. publications, websites etc.**
Approaches/ Strategies	Adapting conservation responses to climate change imperatives *NSBA: A national spatial biodiversity assessment for South Africa*	Under implementation, and ongoing	High quality land use, population and land cover/natural resource data	Data quality, high cost, long term commitment and skills requirement of obtaining sufficiently high quality data, capacity and skills to model and visualize data	Continuity of skills in biodiversity quantification, data management and collection essential over years to ensure availability of good data	http://www.sanbi.org/frames/biodiversityfram.htm
Practices	Adapting conservation responses to	Under implementation	Local, regional and national	Competition with other land use	Extensive stakeholder involvement	e.g. http://bgis.sanbi.org/downloads/Baviaanskloof_Megareserve_Background.pdf www.sanparks.org/parks/addo/

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	climate change imperatives *Cape Action for people and Environment, Succulent Karoo Ecosystem Project, Addo Elephant Park expansion project*		stakeholder involvement Available land of sufficient conservation value in appropriate geographical location	pressures Land-use allocation regulations Benefits for local stakeholders	necessary to obtain local buy-in High quality land use and resource maps are necessary for regional planning	library/2006/newsletters/AugSep06.doc
Technologies	Developing and applying tools for conservation responses for biodiversity conservation under climate change *South African National Biodiversity Global Change and Biodiversity Program: Biovulnerability and Bioadaptation themes*	Under development, and ongoing	High quality spatial biodiversity data, advanced spatial statistical modelling skills, skilled scientific staff, advanced computing, data-basing and coding skills	High end skilled staff, data quality, high cost, long term commitment and skills requirement of obtaining sufficiently high quality data, capacity and skills to model and visualize data	Long term commitment to collecting and databasing spatially explicit data underpins this type of activity. Retention of high skilled staff in competition with other job markets.	www.sanbi.org/climrep www.sanbi.org/sacountrystudy www.sanbi.org http://www.aseanbiodiversity.info/Abstract/51004826.pdf Bomhard, B., Midgley, G.F. (2006) Securing protected areas in the face of climate change: Lessons learned from the South African Cape Floristic Region. Initial report for IUCN PALNET (Protected Areas Learning Network) http://www.parksnet.org/documents/1/6500_documents_document_file_116_original.pdf