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**United Nations Development Programme**

**Country: Swaziland**

**PROJECT DOCUMENT**

**Project Title:** Adapting national and trans-boundary water resource management in Swaziland to manage the expected impacts of climate change.

**UNDAF Outcome(s):** Outcome 2: Increased and more equitable access of the poor to assets and other resources for sustainable livelihoods

**UNDP Strategic Plan Environment and Sustainable Development Primary Outcome:** Outcome 1: Strengthened capacity of developing countries to mainstream climate change adaptation policies into national development plans.

**UNDP Strategic Plan Secondary Outcome:** Outcome 1: Strengthened capacity of local institutions to manage the environment and expand environment and energy services, especially to the poor.

**Expected CP Outcome(s):** Outcome 3: Environmental sustainability improved.

**Expected CPAP Output (s)**

Output 1.1.1. Developed national framework including policies that promote poor access and effectively utilise productive resources.

Output 3.1.1. Improved capacity of key stakeholders for mainstreaming environment issues into poverty reduction.

**Executing Entity/Implementing Partner:** Department of Water Affairs (Ministry of Natural Resources and Energy).

**Implementing Entity/Responsible Partners:** National Meteorology Service (Ministry of Tourism and Environmental Affairs), Swaziland Water and Agricultural Development Enterprise (Ministry of Agriculture).

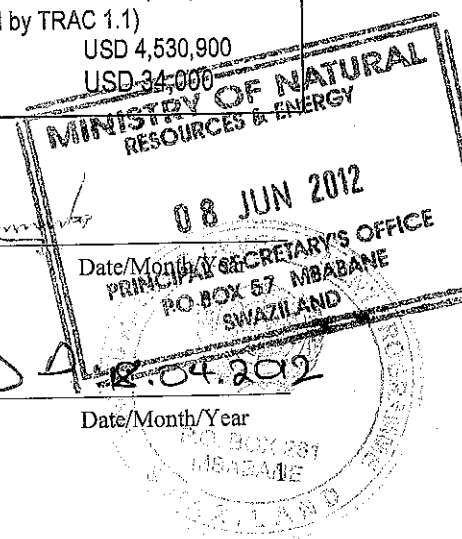
Programme Period:	2011 - 2015	Total resources required	USD 7,494,900
Atlas Award ID:	00061373	Total allocated resources:	USD 7,494,900
Project ID:	00077723	• GEF (SCCF funds)	USD 1,670,000
PIMS #	3603	• Other (co-financing):	
Start date:	May 2012	o UNDP	USD 200,000
End Date	April 2016	o (cash, Swaziland CO TRAC 1.1)	
Management Arrangements	National Implementation	o UNDP	USD 1,060,000
PAC Meeting Date	23 Feb 2011	o (Parallel, funded by TRAC 1.1)	
		o Government	USD 4,530,900
		o KOBWA	USD 34,000

Agreed by Ministry of Natural Resources and Energy:

NAME: MEMBINKOBA MAMBA SIGNATURE: 

Agreed by UNDP:

NAME: ISRAEL DESSALEGN SIGNATURE: 



Date/Month/Year

#### **Brief Description**

This proposal seeks funding from the Special Climate Change Fund to implement a Full-Size Project in Swaziland. The project will focus on one of the national priorities presented in Swaziland's First National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), namely 'adapting national and trans-boundary water resource management to manage the expected impacts of climate change'.

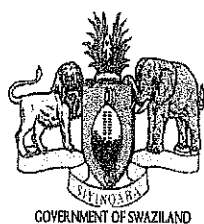
Climate change in Swaziland is expected to lead to overall warming and drying, with a greater frequency and intensity of droughts as well as floods. The negative impacts on the agricultural and water sector are likely to be considerable. Firstly, yields of staple food crops such as maize, sorghum and beans are likely to decrease, thereby threatening national food security. Secondly, surface flows in rivers and streams are likely to have greater variation, with lower base-flows in the dry season, potentially resulting in water shortages for domestic, industrial and agricultural use. And thirdly, groundwater reserves, which are an important source of water for many rural communities, may be reduced as a result of increased rainfall intensity and concomitant increases in surface runoff. These negative impacts of climate change will be exacerbated by baseline conditions of widespread poverty (63% of the population), high unemployment (40%), a high prevalence of HIV (26% of adults), and widespread land degradation as a result of deforestation, alien plant invasions and overstocking of livestock.

Three major rivers flow through Swaziland: the Incomati, Umbeluzi and Maputo Rivers. These rivers are fundamental to the socio-economic development of the country as they support the agricultural and hydro-electric sectors. Managing these rivers appropriately in the face of climate change risks is consequently of the utmost importance for Swaziland. This will require appropriate management of the local river basins such that infiltration of rainwater is promoted and extraction of water from rivers is carefully planned and monitored. Furthermore, negotiations with neighbouring states on trans-boundary river management will need to recognize the likely impacts of climate change and growing human populations. At present, neither river basin management nor international negotiations have placed emphasis on climate change's anticipated impacts on water resources. This is largely because key parties including local communities, River Basin Authorities (RBAs) and national government institutions in Swaziland, have insufficient technical capacity, management capacity, climate change knowledge as well as physical and financial resources.

The goal of the project is to ensure that the management of Swaziland's water resources is adapted to take into account the anticipated impacts of climate change. To this end, the principles of Integrated Water Resource Management (IWRM) will be used within the project, and importantly, climate change risks will be incorporated into this management approach. To facilitate this process, national dialogue between a wide-range of stakeholders from different sectors will be promoted. In addition, information generated and lessons learned from pilot-scale adaptation measures funded by the project, will assist policy implementation for effective adaptation planning and climate risk management in the water sector. These adaptation measures will be focused on improving access to water in rural communities using two methods, namely: i) piloting improved land-use practices that increase rates of water infiltration into soils; and ii) introducing rainwater harvesting techniques. Such measures will have the long-term effect of recharging groundwater levels and increasing surface flow in rivers and streams during the dry season as well as providing communities with improved access to water for both irrigation and drinking purposes. Additionally, by piloting such adaptation measures, communities will be better equipped to manage climate risks. Lastly, negotiators for Swaziland will be trained to ensure that climate change risks are an integral part of discussions on trans-boundary river management with neighbouring states.

The above approaches are summarised in the three outcomes of the project, namely:

1. Institutional capacity for climate change adaptation strengthened through the integration of climate change risks into national water resources management policies and the establishment of inter-sectoral-coordination mechanisms based on inclusive and informed national dialogue
2. Climate change risk management measures integrated into national water and agricultural programmes and implemented in pilot projects to promote adaptation on the ground
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Agreed by Ministry of Natural Resources and Energy:

NAME: M. MUSA SIGNATURE: [Signature]

Agreed by UNDP:

NAME: ISRAEL DESSALEGNE SIGNATURE: [Signature]

MINISTRY OF NATURAL RESOURCES & ENERGY  
08 JUN 2012  
Date/Month/Year  
PRINCIPAL SECRETARY'S OFFICE  
P.O. BOX 57, MBABANE  
SWAZILAND  
18.04.2012  
Date/Month/Year

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**Acronym List**

<b>AfDB</b>	African Development Bank	<b>MTEA</b>	Ministry of Tourism and Environmental Affairs
<b>AFO</b>	Administrative and Financial Officer	<b>M&amp;E</b>	Monitoring and evaluation
<b>AIP</b>	Alien Invasive Plants	<b>NC</b>	National Consultant
<b>ALM</b>	Adaptation Learning Mechanism	<b>NCCC</b>	National Climate Change Committee
<b>AMAT</b>	Adaptation Monitoring and Assessment Tool	<b>NCP</b>	Neighbourhood Care Point
<b>BADEA</b>	Arab Bank for Economic Development in Africa	<b>NDMA</b>	National Disaster Management Agency
<b>CASP</b>	Comprehensive Agriculture Sector Policy	<b>NDS</b>	National Development Strategy
<b>CBA</b>	Community Based Adaptation	<b>NFSP</b>	National Food Security Policy
<b>CCA</b>	Complementary Country Analysis	<b>NGO</b>	Nongovernmental organisation
<b>CDP</b>	Chiefdom Development Plan	<b>NIM</b>	National Implementation Modalities
<b>CMA</b>	Common Monetary Area	<b>NMS</b>	National Meteorological Service
<b>CMP</b>	Comprehensive Mitigation Plan	<b>NWA</b>	National Water Authority
<b>CO</b>	Country Office	<b>NWP</b>	National Water Policy
<b>CP</b>	Country Programme	<b>PAC</b>	Project Appraisal Committee
<b>CPAP</b>	Country Programme Action Plan	<b>PB</b>	Project Board
<b>CWE</b>	Chief Water Engineer	<b>PIF</b>	Project Identification Form
<b>SZWP</b>	Country Water Partnership	<b>PIDU</b>	Planning and Institutions Development Unit
<b>DBSA</b>	Development Bank of Southern Africa	<b>PM</b>	Project Manager
<b>DEA</b>	Department of Energy Affairs	<b>PPG</b>	Project Preparatory Grant
<b>DRR</b>	Disaster Risk Reduction	<b>PSMD</b>	Potential Soil Moisture Deficit
<b>DWA</b>	Department of Water Affairs	<b>PTC</b>	Project Technical Committee
<b>EBA</b>	Ecosystems-Based Adaptation	<b>RBA</b>	River Basin Authority
<b>EDF</b>	European Development Fund	<b>RCU</b>	Regional Coordination Unit
<b>EIB</b>	European Investment Bank	<b>REAS</b>	Renewable Energy Association of Swaziland
<b>EU</b>	European Union	<b>SACU</b>	Southern African Customs Union
<b>FINCOR</b>	Swaziland Development Finance Corporation	<b>SADC</b>	Southern African Development Community
<b>P</b>			
<b>FNC</b>	First National Communication	<b>SCCF</b>	Special Climate Change Fund
<b>FSP</b>	Full-Size Project	<b>SEA</b>	Swaziland Environment Authority
<b>GCF</b>	Global Cooperation Framework	<b>SEAP</b>	Swaziland Environmental Action Plan
<b>GEF</b>	Global Environment Facility	<b>SEC</b>	Swaziland Electricity Company
<b>GDP</b>	Gross Domestic Product	<b>SIDC</b>	Swaziland Industrial Development Company
<b>GoS</b>	Government of Swaziland	<b>SLM</b>	Sustainable Land Management
<b>GWP</b>	Global Water Partnership	<b>SME</b>	Small and Medium Enterprise
<b>IA</b>	Implementing Agencies	<b>SNC</b>	Second National Communication
<b>IC</b>	International Consultant	<b>SNL</b>	Swazi Nation Land
<b>ICDF</b>	International Cooperation and Development Fund	<b>SRES</b>	Special Report Emissions Scenarios
<b>ID</b>	Irrigation District	<b>SWADE</b>	Swaziland Water and Agricultural Development Enterprise
<b>IFAD</b>	International Fund for Agricultural Development	<b>SZWP</b>	Swaziland Water Partnership
<b>IIMA</b>	Interim IncoMaputo Agreement	<b>SWSC</b>	Swaziland Water Service Corporation
<b>IPCC</b>	Intergovernmental Panel on Climate Change	<b>TA</b>	Technical Advisor
<b>IWRM</b>	Integrated Water Resources Management	<b>TB</b>	Tuberculosis
<b>IWRMP</b>	Integrated Water Resources Master Plan	<b>TDL</b>	Title Deed Land
<b>JWC</b>	Joint Water Commission	<b>TIA</b>	Tripartite Interim Agreement
<b>KBDP</b>	Komati River Basin Development Project	<b>TOR</b>	Terms of Reference
<b>KDDP</b>	Komati Downstream Development Project	<b>TPTC</b>	Tripartite Permanent Technical Committee
<b>KJOF</b>	Komati Joint Operations Forum	<b>UN</b>	United Nations
<b>KOBWA</b>	Komati Basin Water Authority	<b>UNCBD</b>	United Nations Convention on Biological Biodiversity
<b>LUSIP</b>	Lower Usuthu Smallholder Irrigation Project	<b>UNCCD</b>	United Nations Convention to Combat Desertification
<b>MDG</b>	Millenium Development Goal	<b>UNDP</b>	United Nations Development Programme
<b>MEA</b>	Multilateral Environment Agreements	<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>MNRE</b>	Ministry of Natural Resources and Energy	<b>UNICEF</b>	United Nations Children's Fund
<b>MOA</b>	Ministry of Agriculture	<b>UNDAF</b>	United Nations Development Assistance Framework
<b>MOEPD</b>	Ministry of Economic Planning and Development	<b>VRA</b>	Vulnerability Reduction Assessment
<b>MOF</b>	Minsitry of Finance	<b>WUA</b>	Water User Association
<b>MOH</b>	Minstry of Health		
<b>MOPSI</b>	Ministry of Public Service and Information		

## **1. Situation Analysis**

### **The proposed SCCF project**

1. Following the approval of the Project Identification Form (PIF) and the Project Preparatory Grant (PPG) by the Global Environment Facility (GEF) in May 2010, this proposal seeks funding from the Special Climate Change Fund (SCCF) for the Full-Size Project (FSP): 'Adapting national and trans-boundary water resource management in Swaziland to manage the expected impacts of climate change'. The proposed SCCF project (hereafter referred to as 'the project') will be executed by the Department of Water Affairs (DWA) within the Ministry of Natural Resources and Energy (MNRE), and the United Nations Development Programme (UNDP) will be the project's implementing agency. The DWA will be responsible for project implementation in collaboration with the Ministry of Tourism and Environmental Affairs (MTEA) and the Ministry of Agriculture (MOA), mainly through SWADE. The goal of the project is to ensure that the management of Swaziland's water resources is adapted to take into account the anticipated impacts of climate change (introduced in paragraph 50 onwards). To achieve this, the project will contribute to addressing the impacts of climate change on the country's water resources as well as on the livelihoods of local communities through the implementation of sustainable and equitable national water resource management that takes into consideration current climate variability and projected climate change.

### **The biophysical environment**

2. The Kingdom of Swaziland (hereafter referred to as 'Swaziland') is a small landlocked country that is bordered to the north, west and south by South Africa and to the east by Mozambique (Figure 1). Despite its small size (17,364 km<sup>2</sup>), Swaziland is characterised by a great variation in geology, climate, vegetation<sup>1</sup> and biodiversity lying at the transition of the Transvaal Plateau to the Indian Ocean coastal plains of KwaZulu Natal (Province in South Africa) and Mozambique. The west of the country is characterised by steep hills and an escarpment while the eastern interior of the country is characterised by gentle undulating plains and basins<sup>2</sup>. The country is divided into four administrative regions namely: Hhohho, Lubombo, Manzini and Shiselweni. Each administrative region has regional councils or local government administration centres called "Tinkhundla". Each *Inkhundla*<sup>3</sup> is made up of about 10 chiefdoms (*Umiphakatsi*).

### *Climate and physiographic regions*

3. The climate is generally humid and subtropical with hot, wet summers (October to March) and cold, dry winters (April to September). The rainfall regimes in Swaziland are convectional with tropical storms during summer and frontal showers during winter<sup>4</sup>. Approximately 75% to 83% of annual rainfall falls in the summer months and 25% falls in the winter months. Annual rainfall is unevenly distributed across the country and varies from approximately 1,500 mm in the extreme west to less than 500 mm in the south-east (Figure 2).

<sup>1</sup>Namely grassland, Lebombo Bushveld, Lowveld Bushveld and Sour Bushveld.

<sup>2</sup>Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

<sup>3</sup>'Inkhundla' is singular, 'Tinkhundla' is plural.

<sup>4</sup>Matondo, J.I., Peter, G. and Msibi, K.M., 2005. Managing water under climate change for peace and prosperity in Swaziland. *Physics and Chemistry of the Earth* 30 (2005): 943 – 949.

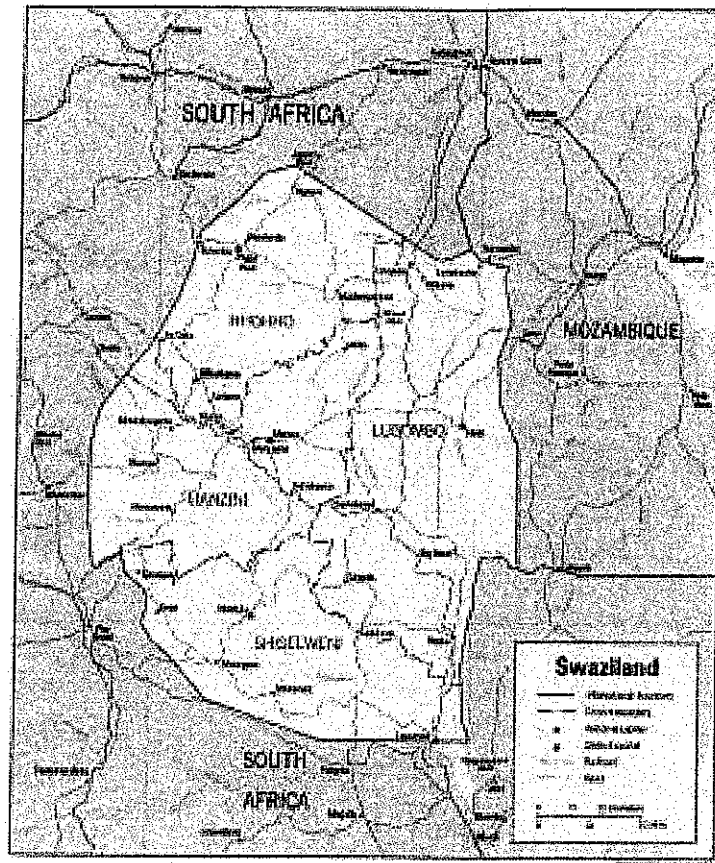


Figure 1: Map of Swaziland<sup>5</sup>.

4. There are four physiographic regions within Swaziland, namely: Highveld, Middleveld, Lowveld and Lubombo, which are clearly distinguished by elevation and relief<sup>6</sup>. The climatic features of each physiographic region are detailed below:
- The Highveld region has a temperate climate characterised by wet summers and dry winters with an average annual rainfall of 1,500 mm. Temperatures vary between a maximum of 33 °C in mid-summer to a minimum of 0 °C at night in mid-winter<sup>7</sup>.
  - The Middleveld region is subtropical and somewhat drier than the Highveld region, with an annual rainfall of approximately 850 mm.
  - The Lowveld region has a subtropical climate and receives the lowest annual rainfall of the four regions (approximately 450 mm). The Lowveld region is characterised by semi-arid areas with erratic rainfall and is the most drought-prone region in the country. This region is also characterised by a large diurnal temperature range and maximum temperatures often reach above 40 °C.
  - The Lubombo region has an annual rainfall of 700 mm and an average annual temperature of 19 °C.

<sup>5</sup>Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

<sup>6</sup> Murdoch, G., 1970. Soils and land capability of Swaziland. Swaziland Ministry of Agriculture, Mbabane cited by Matondo, J.I., Peter, G. and Msibi, K.M., 2005. Managing water under climate change for peace and prosperity in Swaziland. *Physics and Chemistry of the Earth* 30 (2005): 943 – 949.

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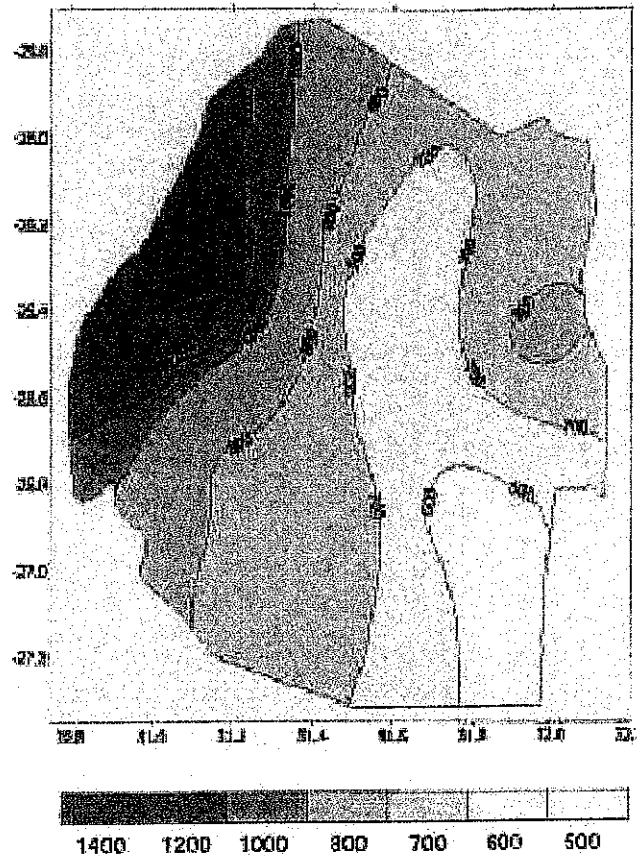


Figure 2: Mean annual rainfall distribution in Swaziland<sup>8</sup>.

#### Land use and natural ecosystems

- Swaziland has a dual system of land tenure comprising Swazi Nation Land (SNL), which is communal land held in trust by the King, and Title Deed Land (TDL)<sup>9</sup>. Overall, SNL covers 74% (1,287,300 ha), while the TDL makes up 26% (444,100 ha) of the country<sup>10</sup>. In terms of land use, extensive communal grazing occupies 50% of the available land, ranching 19% and small-scale subsistence agriculture 12% of the country. Commercial forest is the fourth most common land use in Swaziland (8%) and is predominantly based on large plantations operated by the private sector under the TDL. The remaining 10% of the country consists of large-scale crop agriculture, nature reserves, water reservoirs and their catchments (Table 1), and areas used for settlements, industry and recreation. The distribution of land use practices and the exploitation of natural resources in the country vary according to the land tenure system in each area. In general, small-scale agriculture, extensive communal grazing and some extraction and collection occur on SNL, whereas land uses such as large-scale agriculture, ranching, plantation forestry, parks and reserves are associated with TDL. Although water reservoirs mostly serve TDL, they are also found on SNL.

<sup>8</sup>Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

<sup>9</sup> The SNL is land held and administered under customary law that gives usufruct rights only, whereas the TDL tenure is private ownership with formal legal right to use, sell or lease land.

<sup>10</sup>Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

**Table 1:** Distribution of the main land uses in each physiographic region of Swaziland<sup>11</sup>.

Land uses system	Highveld		Middleveld		Lowveld		Lubombo		Country	
	Ha	%	Ha	%	Ha	%	Ha	%	Ha	%
Small-scale crop agriculture	39,100	6.9	74,000	15.4	84,200	15.1	16,100	10.9	213,400	12.3
Large-scale crop agriculture	1,100	0.2	16,400	3.8	81,400	16.9	2,800	1.9	103,700	6.0
Extensive communal grazing	320,600	56.7	291,000	60.3	173,800	30.5	80,400	54.3	865,800	50.0
Ranching	49,500	6.7	85,600	17.8	164,300	31.0	32,700	22.1	332,300	19.2
Commercial forest	132,300	23.4	7,500	1.6	0	0	0	0	139,800	8.1
Extraction and collection	0	0	0	0	8,400	1.3	0	0	8,400	0.5
Parks and reserves	20,100	3.5	900	0.4	21,100	4.7	16,100	10.9	58,200	3.4
Water reservoirs	400	0.1	0	0	3,800	0.7	0	0	4200	0.2

6. A number of different veld types are found in Swaziland and these veld types are associated with different physiographic regions in the country. Mountain and Highland Sourveld (forests) occur along river valleys and interfluves in the Highveld. The Middleveld is characterised by tall grasses, hillside bushes and broad-leafed savannah. The Lowveld consists of broad-leafed, microphyllous or Acacia Savannah while the Lubombo is characterised by a mixture of bush and savannah. In Swaziland, natural forests extend over 463,499 ha and Bushveld, Acacia Savannah, Moist Savannah and Dry Acacia Savannah are the largest forest types (Table 2).

**Table 2:** Distribution of forest types in Swaziland<sup>12</sup>.

Forest types	Mountain and Highland	Riparian	Moist Savannah	Acacia Savannah	Dry acacia Savannah	Bushveld	Total
Land area (ha)	11,930	2,344	112,720	150,590	34,025	151,890	463,499

#### Water resources

7. Swaziland lies in three international river basins, namely, the Incomati, Umbeluzi and Maputo river basins. All three of these basins are shared with South Africa and/or Mozambique. Rivers rise in the Eastern Highlands of South Africa, flow through Swaziland and then discharge into the Indian Ocean along the Mozambique coastline<sup>13</sup>. Within Swaziland there are five major river basins that relate to the three international basins as follows (Figure 3):

<sup>11</sup>Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

<sup>12</sup>Ibid.

<sup>13</sup> Integrated Water Resources Master Plan, volume 1 Situation Analysis, Draft final Report, September 2009.

- Both the Komati and Lomati rivers, in the north of the country form part of the Incomati Basin and originate in South Africa and flow out of Swaziland back into South Africa before entering Mozambique.
  - The Mbuluzi River is part of the Umbeluzi Basin and originates in Swaziland and flows into Mozambique.
  - The Lusutfu River and the Ngwavuma River are part of the Maputo Basin. The Lusutfu River, with a number of its major tributaries, originates in South Africa and flows out through Swaziland into Mozambique, forming the border between Mozambique and South Africa. The Ngwavuma River originates in Swaziland and flows into South Africa before entering Mozambique.
8. There are two small catchments lying within Swaziland, namely: the Phongola River catchment in the south and the Lumbobo River catchment in the west. The latter, the Lumbobo, is under-utilised and is not yet taken into account in the overall water management of the country<sup>14</sup>.

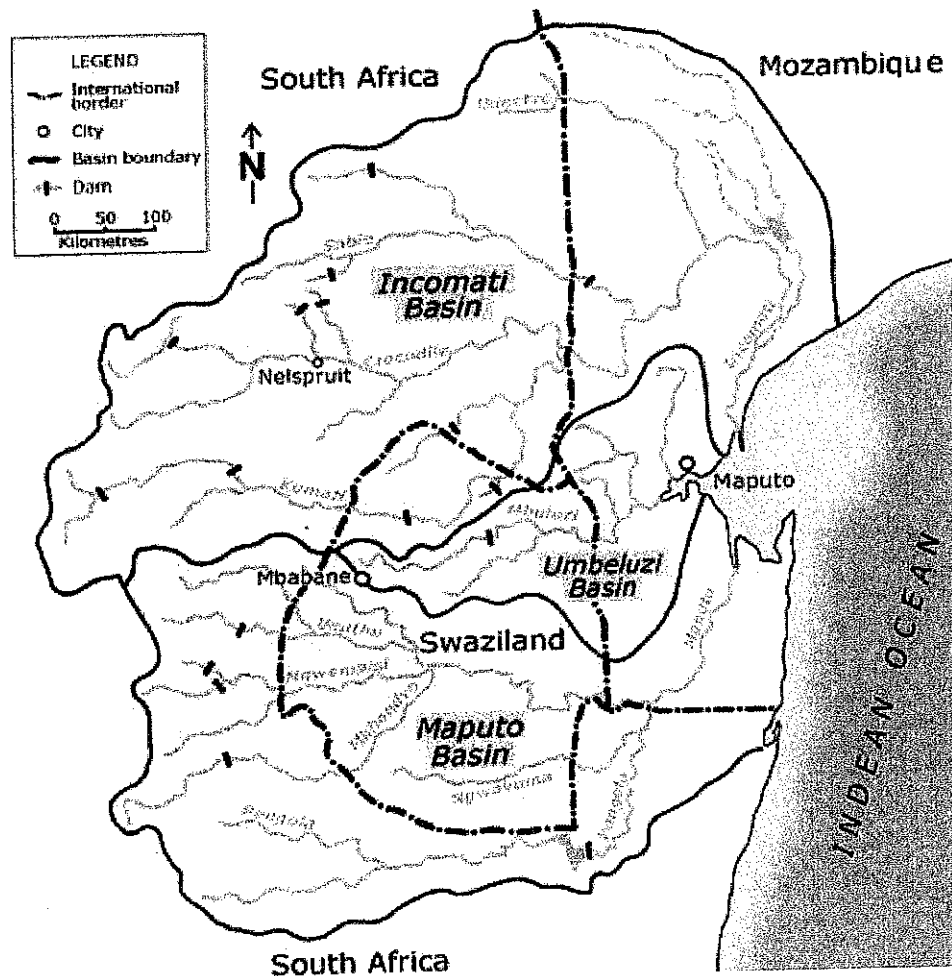


Figure 3: River basins of Swaziland<sup>15</sup>.

9. Swaziland's surface water resources are estimated at 4.45 billion m<sup>3</sup>/year with 42% of the water originating from neighbouring countries and 58% originating within the country<sup>16</sup>. The average

<sup>14</sup> Integrated Water Resources Master Plan, Volume 2: Proposed strategies and action plan, Draft final Report, April 2010.

<sup>15</sup> Luis, A., 2004. Incomati Basin (Mozambique, Swaziland, South Africa), Negotiating a water sharing agreement Main characteristics of the basin. Background paper presented on the UNESCO Conference on "Water: A catalyst for peace", Zaragoza, 6-8, October 2004. <http://www.unesco.org/water/wwap/pccp/zaragoza/basins/incomati/incomati.pdf>

<sup>16</sup> Mwendera, E.J., Manyatsi, A.M., Magwenzi, O. and Dhlamini, S.M., 2002. Water demand management programme for Southern Africa, country report for Swaziland. IUCN (The World Conservation Union) Southern Africa Country Office,

annual runoff for all rivers in Swaziland is estimated to be 2.6 billion m<sup>3</sup>/year<sup>17</sup> representing 18% of total annual rainfall. This figure is relatively high when compared to that of 8% of total annual rainfall for all South African river catchment basins. As a result of such high runoff, there is potential to store more water in Swaziland than is currently stored if additional appropriate storage facilities are developed. The seasonal nature of rainfall within the country (see paragraph 3) renders surface water discharge extremely variable. For example, in dry areas such as the Lowveld, only the larger rivers are perennial while most watercourses tend to flow only after heavy rainstorms.

10. There are nine major dams within Swaziland, each with a height of more than 10 m and with a total storage capacity of approximately 585 million m<sup>3</sup>. Six are being used for primarily irrigation purposes, two for generating hydro-electricity and one used mainly for supplying domestic water to the city of Mbabane and its surrounding communities (Table 3). Maguga, Swaziland's largest dam is used predominantly for the supply of irrigation water. However, a small hydro-power station has recently been added, making Maguga a multi-purpose dam.
11. Agriculture uses approximately 92% of the country's water resources while industrial and domestic water use account for 5% and 3% respectively<sup>18</sup>. The total area under irrigation, which uses only surface water, is estimated at 50,400 ha with seven large sugarcane estates occupying approximately 40,000 ha. Sugarcane plantations occupy 84% of the irrigated land area. In terms of domestic use, it is estimated that 52% of the total population of Swaziland has access to clean water (80% of the population in urban areas and only 35% of the population in rural areas)<sup>19</sup>. The low coverage of clean water supply in rural areas is largely due to poor maintenance of existing water supply systems. In addition, as a result of poor monitoring and control of pollution, surface waters are often unsafe for human consumption. Furthermore, in the Lowveld region, groundwater quality is poor due to high salinity<sup>20</sup>.

**Table 3: Major dams in Swaziland<sup>21</sup>.**

Dams	Capacity (million m <sup>3</sup> )	Date established	River system	Purpose
Maguga	332	2001	Komati	Irrigation
Lubovane	155	2009	Usuthu	Irrigation
Mnjoli	153	1980	Mbuluzi	Irrigation
Sand River	50.3	1965	Komati	Irrigation
Luphohlo	24	1984	Usuthu	Hydropower
Henrick van Eck	9.87	1969	Usuthu	Irrigation
Sivunga	6.78	1972	Usuthu	Irrigation
Nyetane	5.92	1992	Usuthu	Irrigation
Hawane	2.75	1984	Mbuluzi	Hydropower
TOTAL	585			

Pretoria.

<sup>17</sup> Integrated Water Resources Master Plan, volume 1 Situation Analysis, Draft final Report, September 2009.

<sup>18</sup> Manyatsi, A.M, Mhazo, N. and Masariambi, M.T., 2010. Climate variability and change as perceived by rural communities in Swaziland. *Research Journal of Environmental and Earth Sciences* 2 (3): 164 – 169.

<sup>19</sup> Manyatsi, A.M. and Mwendera, E.J. 2007. The contribution of informal water development in improving livelihood in Swaziland: A case study of Mdonjane community. *Physics and Chemistry of the Earth* 32: 1148 – 1156.

<sup>20</sup> Farolfi, S., Mabugu, R.E. and Ntshingile, S.N., 2007. Domestic water use and values in Swaziland: a contingent valuation analysis. *Agrekon* 46(1): 157 – 170.

<sup>21</sup> Milo, P., Mhlanga, N.B. and Senzanje, A., 2008. Emerging issues in water resources management in Swaziland. IASE Conference 2008: Governing shared resources: connecting local experience to global, July 14 -18, 2008, University of Gloucestershire, England. [challengesiasc2008.glos.ac.uk/conference%20papers/papers/M/Mlilo\\_139401.pdf](http://challengesiasc2008.glos.ac.uk/conference%20papers/papers/M/Mlilo_139401.pdf).



12. Currently, the annual potential of groundwater resources in Swaziland is estimated at 666 million m<sup>3</sup> but only 6% of this potential is exploited, with rainwater infiltration estimated to be between 5% and 20% of the average rainfall<sup>22</sup>. The Middleveld and Highveld have the highest potential for groundwater exploitation, but the number of wells in the Highveld is limited due to the greater depth needed to reach the water table. In the Lowveld, where the recharge potential is the lowest and the need for groundwater is the highest, installed wells and taps cover approximately 42% of the estimated potential<sup>23</sup>.
13. In addition to the fact that the potential of groundwater resources in Swaziland is not fully exploited (see paragraph 12), current and future water availability in the country is also threatened by anthropogenic pressures. For example, land degradation and soil erosion due to poor farming practices and overgrazing reduce water infiltration and increase surface runoff, thereby increasing flooding during the peak of summer rains<sup>24</sup>. This also leads to increased sedimentation of rivers, reservoirs and other water storage facilities. Furthermore, there are concerns that the three main forest plantations in Swaziland are established on important upland catchments and as such may impact negatively on the country's water resources<sup>25</sup>. Indeed pine and eucalyptus trees, which largely make up these commercial forests, are known as "thirsty" crops with evapo-transpiration rates so high that they at times exceed the rainwater infiltration rate, leading in most cases to the drying up of some surface water sources in adjoining communities<sup>26</sup>. However, the extent to which timber plantations impact on water resources and environment has yet to be studied intensively in Swaziland.

## **Socio-economic context**

### *Population and HIV/AIDS*

14. The population of Swaziland is currently estimated at approximately 1.3 million people<sup>27</sup>. The demographic distribution is such that 25% of the population lives in urban areas. However, with an urban migration rate of 3% to 5% per annum, it is estimated that approximately 70% of the population will be living in urban or semi-urban areas by the year 2030<sup>28</sup>. The population has a high dependency ratio owing to the fact that 60% of the population is composed of people below the age of 21 years, largely as a consequence of the HIV/AIDS pandemic (see paragraph 15).
15. In 2007, Swaziland became the country with the highest HIV/AIDS prevalence rate in the world (approximately 26% among the adult population and 49% among women aged 25 to 29 years)<sup>29</sup>. This extremely high HIV/AIDS prevalence rate has resulted in: i) reduced population growth rates; ii) reduced life expectancy; iii) increased infant mortality; and iv) considerable changes in the distribution of population by age and sex. Indeed, Swaziland's annual population growth rate has declined significantly from 2.9% in 2004 to 1.2% in 2010<sup>30</sup> with, for example, approximately 10,000 HIV/AIDS-related deaths in 2007. Life expectancy has also changed from 60 years for men and 53 years for women in 2004 to 48 years for both men and women in 2010<sup>31</sup>. Furthermore, over 10% of households are headed by children who have lost both parents to HIV/AIDS and its related diseases, such as tuberculosis (TB) and a significant number by

<sup>22</sup> World Water Assessment Programme. 2009. *The United Nations World Water Development Report 3: Water in a Changing World*. Paris: UNESCO and London: Earthscan: 8 – 12.

<sup>23</sup> Ibid.

<sup>24</sup> Swaziland Environment Action Plan (SEAP) 1997.

<sup>25</sup> Menne, W. 2004. *Timber Plantations in Swaziland: An investigation into the environmental and social impacts of large-scale timber plantations in Swaziland*. Timberwatch Coalition. [www.timberwatch.org.za](http://www.timberwatch.org.za).

<sup>26</sup> Swaziland Environmental Action Plan (SEAP) 1997.

<sup>27</sup> CIA, *The World Factbook* (2010 estimate) <https://www.cia.gov/>.

<sup>28</sup> The United Nations Development Assistance Framework (UNDAF) 2011-2015 for the Kingdom of Swaziland.

<sup>29</sup> Ibid.

<sup>30</sup> Swaziland's second progress report on the achievement of the MDG, 2007.

<sup>31</sup> CIA, *The World Factbook* (2010 estimate) <https://www.cia.gov/>.

grandparents who cannot undertake physical work<sup>32</sup>. Productivity at both the household and national level is becoming increasingly affected by the high rate of HIV/AIDS infection. Since 2004, the average loss in Gross Domestic Product (GDP) growth attributable to HIV and AIDS has been around 1.6% per year<sup>33</sup>. The MOA reported that farming households affected by AIDS-related deaths experienced a 55% reduction in the production of maize, a 34% reduction in the area of land cultivated, and a 30% reduction in herd size<sup>34</sup>.

### *Economy*

16. Swaziland has a small, diversified, open economy which is strongly export-oriented with limited domestic markets. The country's economic development is closely aligned to that of South Africa through membership in the Southern African Customs Union (SACU) and the Rand Common Monetary Area (CMA). Customs duties from SACU account for approximately 66% of Swaziland's government revenues<sup>35</sup>. Furthermore, South Africa is Swaziland's most important trading partner from which it receives more than 90% of its imports and to which it sends 60% of its exports<sup>36</sup>. In addition, worker remittances from South Africa substantially supplement domestically earned income.
17. Swaziland is classified as a lower middle-income country with a GDP per capita of US\$ 2,478 in 2009<sup>37</sup>. Between 1968 and 2009, the country's economy underwent alternate periods of high and low growth levels with the annual growth rate averaging 5.3% over the entire period. However, since 1990, a considerable slowdown of the economy has been noticeable. The country's annual GDP growth in 2009 for example, was estimated at only 0.4%<sup>38</sup>. Since 1995, Swaziland's real GDP growth per capita has been lower than the average growth level in sub-Saharan Africa. Indeed, Swaziland's real GDP growth per capita declined from an annual rate of 2.5% during 1980 – 1994 to 0.7% since then. In contrast, real GDP growth per capita in all of sub-Saharan Africa has averaged 1.5% annually since 1995 and averaged 7.5% in other lower middle-income countries<sup>39</sup>. This slowdown in economic growth is attributable to a number of factors, including: i) decreasing foreign direct investment; ii) declining world commodity prices; iii) uncertainty over political developments in the region; and iv) repeated occurrence of prolonged droughts.
18. The economic structure of Swaziland has changed from primary production to a more diversified economy (Figure 4). This is evident in the decline of the share of the agriculture sector to the country's GDP from an average 34% between 1968 and 1978 to 20% between 1979 and 1989 and to less than 10% since 2001. In contrast, largely as a result of the rapid industrial growth that occurred during the second half of the 1980s, the manufacturing sector's contribution to GDP has increased from 20% in 1968 to more than 40% in the last decade. The manufacturing sector includes a wide range of products, with soft drink concentrates, sugar, wood pulp, cotton yarn, refrigerators, citrus and canned fruit being the main export commodities, accounting for more than 50% of exports<sup>40</sup>. The services sector's contribution to GDP increased from 35% in 1968 to 47% in 1985. However, since 1985, the sector's contribution has experienced a slow decline.

<sup>32</sup> World Health Organization (WHO), World Health Statistics 2010, [www.who.int/gho](http://www.who.int/gho).

<sup>33</sup> World Health Organization (WHO), World Health Statistics 2010, [www.who.int/gho](http://www.who.int/gho).

<sup>34</sup> UNDAF Complementary Country Analysis. The Kingdom of Swaziland, 2009.

<sup>35</sup> Swaziland's Economy Profile. 2010. [http://www.indexmundi.com/swaziland/economy\\_profile.html](http://www.indexmundi.com/swaziland/economy_profile.html).

<sup>36</sup> CIA, The World Factbook (2010 estimate) <http://www.cia.gov/>.

<sup>37</sup> World Bank Economic Database <http://data.worldbank.org/country/swaziland>.

<sup>38</sup> Ibid.

<sup>39</sup> IMF Survey Magazine, July 28, 2008. <http://www.imf.org/external/pubs/ft/survey/so/2008/car072508a.htm>.

<sup>40</sup> CIA, The World Factbook (2010 estimate) <https://www.cia.gov/>.

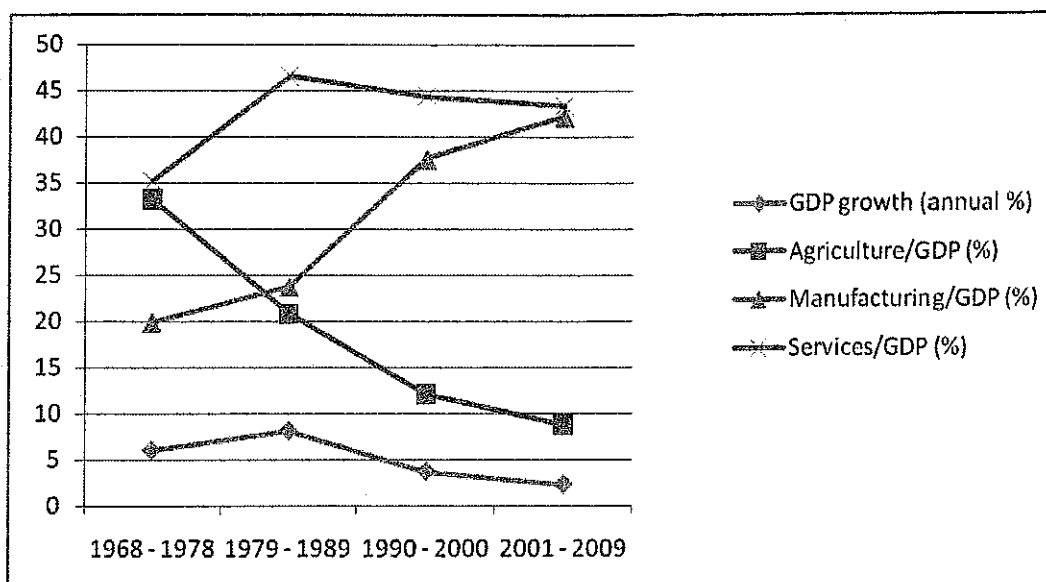


Figure 4: Growth in GDP (%) and GDP contribution of the main sectors within the Swaziland's economy (%)<sup>41</sup>.

19. Although the manufacturing sector is the highest contributor to GDP, Swaziland's economy is predominantly an agriculture-based economy. Agriculture provides substantial intermediary inputs to the manufacturing sector and represents 32% of Swaziland's export earnings. More importantly, agriculture provides livelihoods and income for 70% of the population<sup>42</sup>. Swaziland's agriculture sector consists of a commercial sector running alongside a traditional sector. The commercial sector, with less than 40% of the cultivated land, generates more than 81% of all agricultural output and consists of large sugar estates on TDL as well as some small-scale farmers on SNL (see paragraph 5). Small-scale farmers mainly cultivate irrigated sugar, citrus and pineapple. The traditional farming sector, with more than 60% of the cultivated land, covers the majority of SNL and accounts for 11% of the country's agricultural output. The traditional farming sector is largely rain-fed, small-scale, subsistence, labour intensive and characterized by low average yields with maize as the predominant crop. Consequently, this sector, on which the majority of rural households depend, is very vulnerable to adverse climatic conditions such as drought (see paragraph 46).

#### Developmental challenges

20. The Government of Swaziland (GoS) is faced by a number of challenges in developing its economy. One such challenge, for example, is the heavy disease burden suffered by the Swaziland population. The main diseases affecting Swaziland are: i) HIV/AIDS and its related diseases (see paragraph 15); ii) diarrhoea, malnutrition and infectious diseases causing a high rate of infant mortality; and iii) malaria. Diseases related to infant mortality can be linked to constraints on access to safe water supply and improved sanitation<sup>43</sup>. Malaria occurs mainly during or after the rainy season and an estimated 30% of the population resides in malaria risk areas and 38% in malaria receptive areas<sup>44</sup>. Widespread poverty is another developmental challenge for the GoS. The unemployment rate in the country is relatively high and estimated at 40% in 2006<sup>45</sup>. The latest Household Income and Expenditure Survey (2009/2010) reports that 63% of the population

<sup>41</sup> World Bank Economic Database <http://data.worldbank.org/country/swaziland>.

<sup>42</sup> Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

<sup>43</sup> World Water Assessment Programme. 2009. *The United Nations World Water Development Report 3: Water in a Changing World*. Paris: UNESCO, and London: Earthscan: 8 – 12.

<sup>44</sup> Aquastat. 2005. *Swaziland*. Rome, Food and Agriculture Organization. <http://www.fao.org/nr/water/aquastat/countries/swaziland/index.stm>.

<sup>45</sup> CIA, The World Factbook (2006 estimate) <https://www.cia.gov/>.

lives below the poverty line<sup>46</sup>, while 30% live in abject poverty and an estimated 21% of the population is faced with food insecurity<sup>47</sup>. The incidence of poverty is much higher within rural areas (73%) compared to urban areas (31%). Approximately 89% of the country's poor people live in rural areas<sup>48</sup>, where per capita income is one-fourth, and food consumption half, of the urban average. Furthermore, poverty and gender are linked. For example, 63% of female-headed households are poor and lack productive assets compared with 52% for male-headed households<sup>49</sup>.

21. The country faces serious environmental problems which further hinder its development. The major environmental problems identified in the Swaziland Environmental Action Plan (SEAP) 1997, include: i) decline in wildlife populations due to excessive hunting; ii) loss of biodiversity caused mainly by land use changes such as plantation forestry; iii) land degradation and soil erosion due to deforestation and overgrazing, particularly in areas under SNL; and iv) pollution and degradation of water catchment areas due to human settlement, industrialization and agricultural chemicals. In addition, alien invasive plant (AIPs) species in Swaziland are placing significant pressure on natural forests, grasslands, wetlands and streams. In 2009, the GoS revealed that the country was experiencing a heavy infestation of four AIPs, namely: i) *Chromolaena odorata* (Sandanezwe); ii) *Solenium mauritiumum* (Gwayana); iii) *Caesalpinia decapetala* (Lugagane); and iv) *Lantana camara* (Bukhwebeletane). As a result, the GoS declared AIPs a national disaster<sup>50</sup> threatening the country's economy and food security<sup>51</sup>. These challenges, which will be further exacerbated by predicted impacts of climate change, thwart efforts to mobilise support for development priorities to accelerate economic growth, alleviate poverty, improve social services, and ensure the sustainable use of scarce natural resources<sup>52</sup>.

### **Institutional, policy and legislative context**

22. In 1999, the GoS established a 25-year National Development Strategy (NDS) to guide the long-term socio-economic development of the country through the formulation of development plans designed to eradicate HIV/AIDS, food insecurity and poverty; create employment; and achieve gender equity, social integration and environmental protection. The vision statement in the NDS states that: "by the Year 2022, Swaziland will be in the top 10% of the medium human development group of countries founded on sustainable economic development, social justice and political stability". The NDS identified key macro strategies areas, which included environmental management as a necessary condition for sustainable development. The GoS is committed to the concept of sustainable development and to the implementation of Agenda 21. Sustainable environmental management is expected to forge a development path that provides prosperity for the country's present and future generations<sup>53</sup>.

<sup>46</sup>Estimated at subsisting on less than E461 per month (Emalangeni is the currency within Swaziland).

<sup>47</sup> United Nations Development Assistance Framework (UNDAF), Complementary Country Analysis (CCA), Swaziland, 2009.

<sup>48</sup>Swaziland Household Income and Expenditure Survey.2009/2010.

<sup>49</sup> Government of Swaziland, 2006. Poverty reduction strategy and action programme volume 1.

<sup>50</sup> Shongwe, S. 2009. Swaziland attacked by invasive plants. TIMES of Swaziland, on July 15, 2009. <http://www.times.co.sz/Musa-Hlophe/9220.html>.

<sup>51</sup> Currently there is no available estimate of the impacts of AIPs on watercourses in Swaziland. However, according to estimates from neighbouring South Africa, approximately 8% of the country is covered by AIPs, which cause the loss of some 7% of the annual flow in South Africa's rivers each year – approximately 33 million m<sup>3</sup> of water (this excludes the severe impact upon groundwater reserves). (In: Mukheibir, P. and Sparks, D., 2003. Water resource management and climate change in South Africa: Visions, driving factors and sustainable development indicators. Report for Phase I of the Sustainable Development and Climate Change project. Energy and Development Research Centre, University of Cape Town.).

<sup>52</sup>Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

<sup>53</sup> National Development Strategy, 1999, Government of Swaziland.

## *Water resources*

### Legislation

23. The NDS advocates the development of a new water legislation, policy and regulatory mechanism to facilitate delivery and management of water resources in the country. It also encourages the expansion of smallholder irrigation within a national irrigation development plan by further planning and construction of small- to medium-sized dams to promote irrigation-based agriculture and a shift from subsistence farming to commercial agricultural production on SNL<sup>54</sup>. In striving to achieve the aspirations of the NDS and optimum utilisation of the available water resources in the country, the vision of the water sector, as stated in the NDS is therefore as follows: "National economic prosperity and social uplifting through equitable, productive and optimum utilisation of water resources while ensuring environmental sustainability"<sup>55</sup>.
24. Following the recommendations set in the NDS, Swaziland adopted a Water Act in 2003 to replace the 1967 Water Act. The Water Act (Act No. 7 of 2003) declares all water found naturally in the country as a national resource<sup>56</sup> and makes it a requirement for anyone utilising the water to apply for a permit, except for persons or communities who use the water for primary purposes<sup>57</sup>. The Act also seeks to streamline the water allocation process and to improve catchment management through enhanced stakeholder participation and decentralisation of the management. As such, the Act makes the establishment of the following institutions mandatory: i) National Water Authority (NWA); ii) River Basin Authorities (RBAs) for five major rivers; iii) Irrigation Districts (IDs) and iv) Water User Associations (WUAs). The Act also provide regulations for various matters relating to water such as: i) managing and conserving water resources, including groundwater; ii) granting of water rights; iii) controlling pollution; and iv) controlling water sport access. The Act makes further provisions for the development of an Integrated Water Resources Master Plan (IWRMP) which shall contain an inventory of the total water resources of Swaziland and a comprehensive programme of actions<sup>58</sup> (see paragraph 26 below).
25. In addition to the Water Act 2003, the following pieces of legislation also influence water use and management in the country<sup>59</sup>:
- Swaziland Electricity Company Act (2007);
  - Environmental Management Act (2002);
  - Swaziland Administrative Order (1998);
  - Water Services Act (1992);
  - Swaziland Environment Authority Act (1992);
  - Natural Resources Act (1951);
  - The Protection of Fresh Water Fish Act (1938); and
  - Water Pollution Control Regulations (2010).

<sup>54</sup> National Development Strategy, 1999, Government of Swaziland.

<sup>55</sup> National Water Policy, Final Draft June 2009, Government of Swaziland.

<sup>56</sup> This was further deep rooted in the 2005 Constitution that declare, in its section 210, water as a national resource and vests the ultimate responsibility for its protection in the State. The section 215 of the 2005 Constitution, rules out any private right of property in any water found in Swaziland.

<sup>57</sup> Defined as "the use of water for domestic requirements, sanitation, the watering of animals not exceeding 30 head of cattle or the irrigation of land not exceeding one-quarter hectare adjoining or occupied with a homestead of not more than 10 persons but does not include the use of water by a local authority for distribution to the inhabitants of the area"

<sup>58</sup> Swaziland Water Act, 2003.

<sup>59</sup> Updated from FAO (Content Source); Zaikowski, L. (Topic Editor) "Water profile of Swaziland". In: Encyclopedia of Earth. Eds. Cutler J. Cleveland (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). [First published in the Encyclopedia of Earth September 2, 2008; Last revised Date September 2, 2008; Retrieved December 20, 2010 ([http://www.eoearth.org/article/Water\\_profile\\_of\\_Swaziland?topic=49483](http://www.eoearth.org/article/Water_profile_of_Swaziland?topic=49483)).

*Policies and plans*

26. In the absence of a water policy, the GoS began a process of developing a National Water Policy (NWP) in 2000 through the financial support of the UNDP. In 2001, a draft policy was produced and taken through an intensive stakeholder consultation process both within and outside of the government. However, the process was temporarily stopped to allow formulation of regional water policies at the SADC level to be first concluded. In 2007, the process was reinstated and the final draft approved by the NWA was released in June 2009<sup>60</sup>. The final draft NWP has been submitted to the Cabinet through the Portfolio Committee for the Ministry of Natural Resources and Energy (MNRE) and its adoption by Parliament is expected in the near future<sup>61</sup>. The NWP provides a framework and background within which the Water Act 2003 operates and provides further details on the management of water resources in the country. The overall goal of the NWP is sustainable development and management of water resources through integrated planning. An important element of the policy is the improvement of water availability for both social and economic productivity. Based on the concept of Integrated Water Resources Management (IWRM), the policy also provides clear demarcation of the responsibilities of the various stakeholders and institutions involved in the integrated development and management of water resources in the country<sup>62</sup>.
27. In conjunction with the development of the NWP, Swaziland is also in the process of developing an IWRMP as required by the Water Act 2003 (see paragraph 24). The draft version of the IWRMP was released in October 2010 and the review process is underway. The IWRMP as it currently stands, provides strategic guidance to decision-makers, policy-makers, water managers and water users on how best to develop and manage the country's water resource within the framework of the new legislation and policy (Water Act 2003 and draft 2009 NWP). The matters covered by the IWRMP include: i) increasing water availability within the river basins in Swaziland; ii) improving environmental protection; iii) promoting agricultural development within communities as well as at the commercial level to alleviate poverty; iv) focus on quality of life including poverty eradication; v) conserving water and land resources; vi) defining water allocation criteria; vii) promoting integrated water resources management (IWRM) and viii) improving provision of water to urban, rural and peri-urban areas. The IWRMP emphasises the fact that water resources management in Swaziland takes place entirely in a trans-boundary context with resulting potential limitations to the development and expansion of water resources use in the country.
28. Other related policy documents that guide water management in the country are the<sup>63</sup>:
- Comprehensive Agriculture Sector Policy (2007);
  - National Food Security Policy (2007);
  - Irrigation Policy (2007);
  - Forestry Policy (2007);
  - Soil Conservation Policy (2005);
  - Land Use Management Policy (2004);
  - National Energy Policy (2003);
  - Biodiversity Conservation and Management Policy (1999); and
  - The Draft National Land Policy (1999).

<sup>60</sup> National Water Policy, Final Draft June 2009, Government of Swaziland.

<sup>61</sup> Information obtained by the IC during a meeting with Mr. Obed Ngwenya, Director of the Department of Water Affairs, MNRE on 8 December 2010. See Annex 5 regarding stakeholder consultations.

<sup>62</sup> National Water Policy, Final Draft June 2009, Government of Swaziland.

<sup>63</sup> Information obtained during the project inception workshop held on the 18 November 2010 at the Royal Swazi Convention Centre, Ezulwini. See Annex 6 containing the Inception workshop report.

### *Institutions*

29. Swaziland's major institutions for water development and management are housed within the DWA of the MNRE and its parastatals. These are:
- The Water Resource Branch, which is responsible for stream flow observation, planning of water resources and control of pollution.
  - The Rural Water Supply Branch, which is responsible for water supply and sanitation in rural areas.
  - The Groundwater Unit of the Geological Surveys and Mines Branch, which is responsible for drilling boreholes and monitoring the withdrawal of underground water resources.
  - The Swaziland Water Service Corporation (SWSC), a parastatal organization, responsible for urban and peri-urban water supply and sanitation.
  - Swaziland Water and Agricultural Development Enterprises (SWADE): a parastatal institution, with a mission to empower local communities in designated areas to attain improved quality of life and be able to sustain it by: i) promoting the participation of smallholder farmer organisations in irrigated agriculture and ii) enhancing private sector development of small and medium enterprises (SMEs) in agricultural development. SWADE is currently running two large government projects, namely the Komati Downstream Development Project (KDDP) and the Lower Usuthu Smallholder Irrigation Project (LUSIP) (see Annex 7 for additional details).
30. Furthermore, since the adoption of the Water Act (2003), Swaziland has adopted a more decentralized designation of powers to guide the future of water development and management in the country with the establishment of new water institutions as required by the Act, including:
- The National Water Authority (NWA): a highly participatory body corporate for the overall management of water issues in Swaziland whose role is to supervise the activities of the Basin level structures described above and to provide policy advice to the DWA. The NWA is composed of nine representatives of four government ministries (MNRE, MOA, Ministry of Health (MOH), and Ministry of Economic Planning and Development (MEPD)) and five representatives for each RBA. The NWA provides policy advice to the DWA<sup>64</sup>.
  - Basin level structures: River Basin Authorities (RBAs), Irrigation Districts (IDs) and Water User Associations (WUAs). Currently, there are five RBAs: Lomati, Komati, Mbuluzi, Usuthu and Ngwavuma. The RBAs' mandate is to manage dams and river based resources by issuing water user permits amongst other responsibilities.
31. In addition, Swaziland has a non-governmental organisation (NGO), the Swaziland Water Partnership (SZWP)<sup>65</sup>, which is a neutral multi-stakeholder forum of partners in water management that facilitates the discussion of topics related to water in Swaziland. The SZWP facilitates sharing of ideas and allows for proposing means of improving water resource management in the country. The stakeholder forum is cross-sectoral and includes partners from government, parastatals, private companies, NGOs, farmers associations, consultants and capacity building institutions. The representation ensures the inclusion of small-scale water users in decision-making, basin coverage and water use. The SZWP and the NWA have worked together to develop the draft of the IWRMP (see paragraph 27). However, due to insufficient funding, the activities of the SZWP are stalled and are currently limited to the circulation of GWP newsletters to its members<sup>66</sup>.
32. The Swaziland Environment Authority (SEA), also plays an important role in the maintenance of water resources as a parastatal under the MTEA, responsible for environmental protection by

<sup>64</sup>Information obtained by the IC during a meeting with Mr. Obed Ngwenya, Director of the Department of Water Affairs, MNRE on 8 December 2010. See Annex 5 regarding stakeholder consultations.

<sup>65</sup>The Swaziland SZWP is linked to the Global Water Partnership (GWP) which is an international network development agencies, country members, NGOs and research organizations that offers practical advice for sustainably managing water resources at national and regional levels.

<sup>66</sup>Information obtained by the IC during a meeting with Dr Leonard Ndlovu, the representative of the Swaziland Royal Sugar Cane Corporation at the SZWP, on 13 December 2010. See Annex 5 regarding stakeholder consultations.

enforcing and monitoring pollution control and allocation of environmental compliance certificates. In addition, the MOA under its small irrigation unit, influences water resources in the country by constructing small earth dams and assisting farmers with the utilisation of water resources.

33. All of Swaziland's rivers are international rivers and consequently, the management of surface water resources in the country requires collaboration with its neighbours Mozambique and South Africa. The management and utilisation of the shared water sources is governed by the (revised) SADC Protocol on Shared Watercourses as a regional framework agreement and, in case of the Incomati and Maputo watercourses, by the basin-specific Interim Inco Maputo Agreement (IIMA)<sup>67</sup>. The IIMA contains detailed provision on water allocation between riparian countries (as well as use sectors within each country), broken down into specific allocations for each sub-catchment. Part of the allocation regime is a water use reduction regime designed for periods of extended drought, which stipulates the order in which water allocation to user sectors needs to be reduced.
34. Being an interim agreement, the IIMA is scheduled for revision. The process for negotiating the future Comprehensive Agreement(s) has been triggered in the second half of 2010 and formal negotiations/ drafting of the agreement(s) are expected to start in 2012. Similarly, negotiations between Swaziland and Mozambique on management and use of the Umbeluzi water resources are currently ongoing.

#### *Climate risks and climate change planning*

35. The Swaziland Climate Change Programme (SCCP) is being undertaken by the GoS as a means of addressing climate change impacts in the country and as a fulfilment to the country's commitments to the United Nations Framework Convention on Climate Change (UNFCCC) (see Section 2.2).
36. The National Meteorological Service (NMS), under the Ministry of Tourism and Environmental Affairs (MTEA), is the country's focal point for climate change, and as such is responsible for implementing the programme: "Enabling Activities for the Preparation of Swaziland's Second National Communication (SNC) to the UNFCCC". This programme is funded by the financial mechanism of the UNFCCC, the Global Environmental Facility (GEF), and is being implemented by the UNDP.
37. The National Climate Change Committee (NCCC) was informally established in June 2010 and comprises representatives from diverse government agencies (without representation from civil society or the private sector). The NCCC's main mandate is to provide overall coordination and guidance related to the development and implementation of strategies on climate change in the country. Furthermore, the NCCC is expected to carry out education and public awareness campaigns on climate change. At present, the NCCC has not yet been gazetted, but the process to legalise the committee has begun. The project will assist with improving the status of the NCCC and will assess options for its institutional development in order to strengthen its coordination function.
38. Climate change issues are not specifically mentioned in the existing policy framework, except for two policies, namely the 2007 Comprehensive Agricultural Sector Policy (CASP) and the 2007 National Food Security Policy (NFSP). Both the CASP and NFSP state that it is 'national policy

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<sup>67</sup>Formally named: Tripartite Interim Agreement (TIA) for cooperation on the protection and sustainable utilisation of the water resources of the Incomati and Maputo watercourses.



to develop climate change adaptation strategies to enhance food security, agricultural production and livelihoods’.

39. In brief, the strategies identified in CASP and NFSP to implement the policies include: i) to follow recommendations of the UNFCCC, UNCBD and UNCCD; ii) to investigate and monitor the impact of climate change on food security; iii) to investigate and assess relevant resilient ecosystems; iv) to introduce high yielding, drought and disease-tolerant varieties of crops and animals; v) to strengthen existing early warning capabilities and establish a practical climate information system for farmers; and vi) to establish efficient linkages between research, extension, NGOs, parastatals and other stakeholders. The CASP also notes that the importance of climate change is neglected in agricultural research and recommends setting up a database of climate change-related research.

#### *The National Disaster Management Agency (NDMA)*

40. NDMA is housed under the Office of the Deputy Prime Minister and co-ordinates programmes of preparedness and relief operations related to natural disasters. They are the only agency mandated to plan for and deal with natural disasters within Swaziland. The NDMA will play key role in climate change risk management due to the intrinsic link between climate change and national disasters (e.g. floods and drought).

### **Observed climate variability and hazards and their impacts in Swaziland**

#### *Observed climate variability and hazards*

41. The observed climate variability in Swaziland, as part of the southern Africa region, over the recent past includes the following:
- an increase in the number of warm spells over southern Africa, and a decrease in the number of extremely cold days between 1961 and 2000<sup>68</sup>;
  - an increase in temperature of approximately 1 °C with an average warming of 0.05 °C per decade between 1900 and the 1980s<sup>69</sup>;
  - a 12% increase in days with temperatures over 35 °C;
  - up to a 50% decline in rainfall during the months of September and October<sup>70</sup>;
  - an increased inter-annual variability of rainfall in the post-1970 period, with higher rainfall anomalies and more intense and widespread droughts<sup>71,72</sup>.
42. There is evidence of climate variability in the Lowveld region of Swaziland, which is the major sugarcane growing and ranching region in the country. Rainfall over a 45-year period (1961 – 2006) in this region shows high inter-annual variability with a steady decline in rainfall since 2004 (Figure 5). Indeed, within two years (2000 – 2002), rainfall changed from being the highest

<sup>68</sup> Boko, M., Niang, I., Nyong, A., Vogel, C., Githeko, A., Medany, M., Osman-Elasha, B. Tabo, R. and Yanda, P., 2007: Africa. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge UK: 433 – 467.

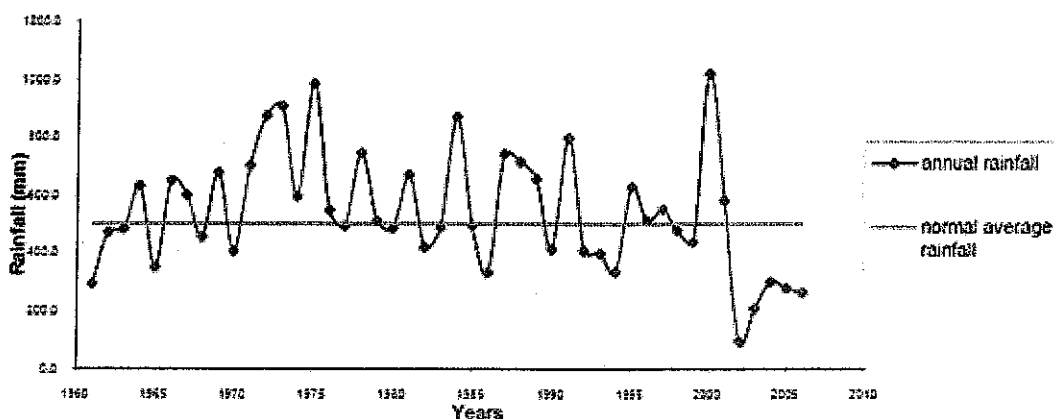
<sup>69</sup> Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

<sup>70</sup> National investment brief, Swaziland. 2008. Presented at the Water for Agriculture and Energy in Africa: the challenges of climate change. Sirte, Lybian Arab Jamahiriya, 15 – 17 December 2008. <http://www.sirtewaterandenergy.org/docs/reports/Swaziland-Draft2.pdf>

<sup>71</sup> Boko, M., Niang, I., Nyong, A., Vogel, C., Githeko, A., Medany, M., Osman-Elasha, B. Tabo, R. and Yanda, P., 2007: Africa. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge UK: 433 – 467.

<sup>72</sup> However, no long-term trend in rainfall across the country has been noted.

received in the 45-year period (more than 1,000 mm in 2000) to being the lowest in the 45-year period (approximately 100 mm in 2002)<sup>73</sup>.



**Figure 5:** Rainfall trend in the Lowveld region in Swaziland (1961 – 2006)<sup>74</sup>.

43. In 2010, a study was undertaken to determine how people from three rural communities representing the Middleveld, the Lowveld and the Lubombo physiographic regions, perceive climate variability and change<sup>75</sup>. Most of the 60 people interviewed (20 from each community) reported drought, poor rains, change in rainfall patterns and increase in temperature as observed signs of climate variability in the country.
44. The country is experiencing drought-related problems during years with low flows and flood-related problems during the summer months of wetter years. For instance, the following climate hazards were reported in Swaziland since 1980<sup>76</sup>:
- recurrent droughts in 1983, 1990, 1992, 1994, 1995, 2001, 2007 and 2008;
  - tropical cyclone (Domoina) in 1984; and
  - torrential rains led to flooding in 2000.

#### *Impacts of climate variability and hazards*

45. Current variability and occurrence of climate hazards already exert a strong influence on the day-to-day economic development of the Swaziland, particularly in terms of food security and livelihood, water, health and ecosystems<sup>77</sup>. The prolonged drought conditions between the period 1989 and 1992, for example, were cited as one of the major contributing factor to the reduction in the country's overall economic growth since 1980 (see paragraph 15). Additionally, such drought conditions have adversely affected communities and livelihoods. For example, severe droughts occurring in 1983, 1992, 2001, 2007 and 2008, affected more than 250,000 people each time (Figure 6), and over 500 people lost their lives due to the 1983 drought.

<sup>73</sup> Simelane, L. 2009. Adapting to climate change and variability in commercial agricultural production: the case of the sugar industry in Swaziland. MSc. Thesis School of Geography, Archaeology and Environmental Studies, Faculty of Science, University of Witwatersrand. <http://hdl.handle.net/10539/7258>.

<sup>74</sup> Simelane, L. 2009. Adapting to climate change and variability in commercial agricultural production: the case of the sugar industry in Swaziland. MSc. Thesis School of Geography, Archaeology and Environmental Studies, Faculty of Science, University of Witwatersrand. <http://hdl.handle.net/10539/7258>.

<sup>75</sup> Manyatsi, A.M, Mhazo, N., and Masariambi, M.T., 2010. Climate variability and change as perceived by rural communities in Swaziland. *Research Journal of Environmental and Earth Sciences* 2 (3): 164 – 169.

<sup>76</sup>Ibid.

<sup>77</sup>Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

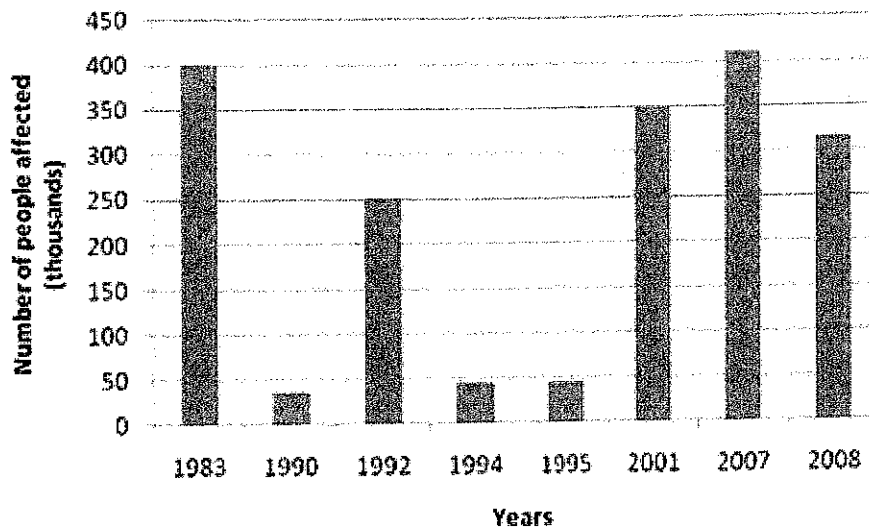


Figure 6: Drought in Swaziland and number of people affected<sup>78</sup>.

46. According to those interviewed (see paragraph 43), climate variability and hazards have resulted in an inadequate food supply related to poor crop yields, poor pastures and the death of their livestock. For example, in 1992, the country lost 20% of its total herd of cattle (approximately 90,000 animals) due to drought. In 2007, close to 50% of the population required food aid due to drought-induced crop failure<sup>79</sup>. Erratic weather (delayed rains and droughts) is also cited as one of the main contributing factors to the steady decline in the production of maize, the country's staple food since 2000. Prior to 2000, Swaziland was harvesting on average over 100,000 tonnes of maize per annum, but since then the average has dropped to approximately 70,000 tonnes. In some areas, total maize production dropped by 70%<sup>80</sup>.
47. Recurrent droughts in the country are also putting stress on the availability of water resources for hydro-electric power. The Swaziland Electricity Company's (SEC) capacity to generate hydro-electric power continues to be negatively affected by recurrent droughts. For example, the country experienced its lowest levels of water flows in the summer of 2003 and consequently the contribution from internal generation was reduced to 10% of normal generation<sup>81</sup>. Availability of potable drinking water is also largely reduced during floods and long periods of droughts.
48. In 1984, cyclone Domoina affected over 400,000 people (approximately 40% of the population) and caused damages worth US\$ 54 million to houses and agricultural fields, as well as infrastructure such as roads, electricity and telephone lines. In 2000, torrential rains led to flooding in many parts of the country, affecting an estimated total of 272,000 people<sup>82</sup>.
49. It has been noted that after heavy rainfall and flood events, there is also an increased prevalence of waterborne diseases, such as malaria, cholera and typhoid. Furthermore, it is suggested that the geographical distribution and range of plants in the country have been subject to change with changing climatic conditions and extremes in climate, such as drought<sup>83</sup>.

<sup>78</sup> Manyatsi, A.M, Mhazo, N., and Masariambi, M.T., 2010. Climate variability and change as perceived by rural communities in Swaziland. *Research Journal of Environmental and Earth Sciences* 2 (3): 164 – 169.

<sup>79</sup> Ibid.

<sup>80</sup> World Food Programme, Profile Swaziland: <http://www.wfp.org/countries/swaziland>.

<sup>81</sup> Mwendera, E.J., 2006. Available water for hydropower generation in Swaziland. *Physics and Chemistry of the Earth* 31: 952 – 959.

<sup>82</sup> Manyatsi, A.M, Mhazo, N., and Masariambi, M.T., 2010. Climate variability and change as perceived by rural communities in Swaziland. *Research Journal of Environmental and Earth Sciences* 2 (3): 164 – 169.

<sup>83</sup> Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

## **Climate change projections in Swaziland**

### *Predicted changes in temperature and rainfall*

50. The following climate change projections based on regional climate models for the southern African region have been made for Swaziland:
- an overall increase in annual temperature ranging from less than 1 °C to 3.5 °C by 2080<sup>84</sup>;
  - an increase in summer and winter mean surface air temperature of 3.7 °C and 4 °C, respectively, by 2080<sup>85</sup>;
  - an increase in summer rainfall in most parts of Swaziland by 2080<sup>86</sup>; and
  - a significant increase in extreme rainfall events and possible changes in the seasonality with a decrease in early summer rainfall and an increase in late summer rainfall<sup>87</sup>.
51. Projections for Swaziland based on downscaled climate models include the following changes in temperature and rainfall<sup>88</sup>:
- an increase in temperature in all months ranging from 0.5 °C to 4.3 °C by 2075;
  - a decrease in total annual rainfall in the range of 5% to 12% on average by 2075;
  - an increase in rainfall in the late spring to mid-summer (October to January), which is likely to lead to an increased flooding risk; and
  - a decrease in rainfall in the winter season, which is likely to lead to a higher frequency of drought events.
52. The eastern Lowveld region, particularly Mhlume, an area in which nearly half of the total area of irrigated sugarcane of the country is located, is expected to become hotter and drier. The following projections have been made for this region:
- an overall rise of temperature from a minimum of 2 °C to more than 4 °C by 2050<sup>89</sup>; and
  - a general decrease in monthly rainfall by up to 33% with high levels of evapo-transpiration by 2050<sup>90</sup>.

### *Predicted change in climatic zones*

53. Under climate change scenarios, major changes in the spatial distribution of climatic zones are predicted in Swaziland. Based on the Köppen's classification<sup>91</sup> of climate zones, the following predictions have been made for both a 3 °C and 6 °C rise in temperature (Table 4):
- the Highveld region currently with a Cwb climate (warm temperate rainy with dry winter and cool summer) is expected to become a Cwa climate (humid subtropical hot)<sup>92</sup>; and
  - the Upper Middleveld, the Lower Middleveld and the Lubombo, which are Cwa climate zones, are expected to change to BSh climate zones (hot steppe arid).

<sup>84</sup> Scholes, R.J. and Biggs, R. 2004. The regional scale component of the Southern African millennium vegetation assessment. Millennium Vegetation Assessment, CSIR, Pretoria, South Africa.

<sup>85</sup> Hudson, D.A. and Jones, R.D., 2002. Regional climate model simulations of present day and future climates of Southern Africa. Technical note 39, Hadley Centre, Blackwell.

<sup>86</sup> Hewiston, B.C. and Crane, R.G., 2006. Consensus between GCM climate change projections with empirical downscaling: precipitation over South Africa. *International Journal of Climatology* 26: 1315 – 1337.

<sup>87</sup> Tadross M., Jack, C. and Hewiston, B., 2005. On RCM-based projections of change in southern African summer climate. *Geophysical Research Letters* 32: L23713, doi:10.1029/2005GL024460.

<sup>88</sup> Matondo, J.I., 2010. Generating information required in climate change studies in Swaziland. *Water International* 35: 223 – 232.

<sup>89</sup> Knox, J.W., Diaz, R.J.A., Nixon, D.J. and Mkhwanazi, M., 2010. A preliminary assessment of climate change impacts on sugarcane in Swaziland. *Agricultural Systems* 103: 63 – 72.

<sup>90</sup> Ibid.

<sup>91</sup> Köppen's classification is a widely used vegetation-based empirical climate classification system developed by a Wladimir Köppen in 1900. The classification has five major terrestrial climates types represented by letters A, B, C, D, and E.

<sup>92</sup> Anonymous.

**Table 4: Projected changes of climatic zones in Swaziland<sup>93</sup>.**

Physiographic region	Current climate conditions				Projected climate zones	
	Mean Temperature (°C)			Köppen Class	Köppen class for a scenario of 3 °C rise in temperature	Köppen class for a scenario of 6 °C rise in temperature
	Annual	January	July			
Highveld	17	20	12	Cwb	Cwa	Cwa
Upper Middleveld	20	24	15	Cwa	Cwa	Cwa
Lower Middleveld	21	25	16	Cwa	BSh	BSh
Western Lowveld	22	26	18	BSh	BSh	BSh
Eastern Lowveld	22	27	17	BSh	BSh	BSh
Lubombo Ridge	21	26	17	Cwa	Cwa/BSh	BSh

54. Based on the Potential Soil Moisture Deficit (PSMD), agro-climate zones in the country currently show strong east-west delineation. PSMD is highest (700 – 800 mm) in the Lowveld region in the east around Big Bend and then declines westwards towards Malkerns in the Highveld (Figure 7). It is predicted that by the year 2050, under the Intergovernmental Panel on Climate Change (IPCC) Special Report Emissions Scenarios (SRES) A2<sup>94</sup> and B2<sup>95</sup> agro-climate zones will shift as follows (Figure 7):

- zones with PSMD levels higher than 800 mm will increase in area and magnitude, moving further north towards the sugarcane growing areas of Mhlume and Simunye in the Eastern Lowveld<sup>96</sup>; and
- zones with PSMD levels lower than 300 mm will reduce and become confined to the extreme west of the country<sup>97</sup>.

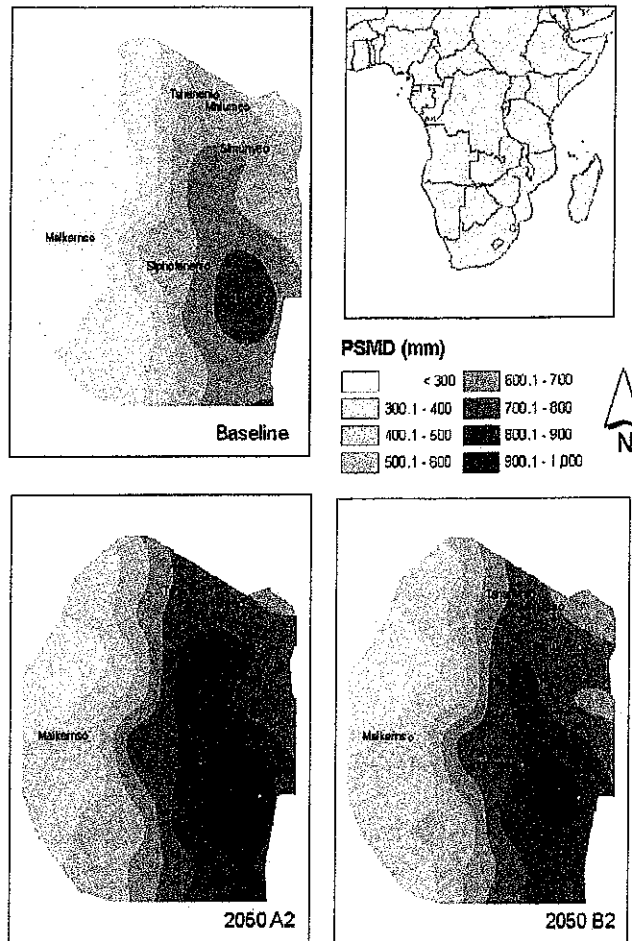
<sup>93</sup> Rimmelzwaal, 2006. Preparatory report for the formulation of an MSP proposal on adapting to climate change in the Lubombo-Lowveld Region (UNDP).

<sup>94</sup> A2 depicts a scenario of a regionally oriented economic development with predicted increase in temperature between 2.0 °C and 5.4 °C.

<sup>95</sup> B2 depicts a scenario of a local environmentally sustainable development with predicted increase in temperature between 1.4 °C and 3.8 °C.

<sup>96</sup> Knox, J.W., Diaz, R.J.A, Nixon, D.J., Mkhwanazi, M., 2010. A preliminary assessment of climate change impacts on sugarcane in Swaziland. *Agricultural Systems* 103: 63 – 72.

<sup>97</sup> Ibid.



**Figure 7:** Spatial variability in agroclimate zones based on PSMD for Swaziland<sup>98</sup>.

### **Predicted impacts of climate change in Swaziland**

55. The predicted impacts of climate change could have significant adverse influences on climate-sensitive sectors such as water, agriculture, ecosystems and health. This will further jeopardise development efforts in Swaziland which are already affected by factors such as: i) a high prevalence of HIV/AIDS; ii) a high poverty level and unemployment; iii) recurrent droughts; iv) land degradation; and v) a considerable dependence of the population on rain-fed agriculture (see paragraph 19).

#### *Climate change impacts on water resources*

56. The impact of climate change on hydrology and water resources has been evaluated for Swaziland in four catchments, namely: Usuthu, Mbuluzi, Komati and Ngwavuma. Simulations show that water resources in Swaziland are highly sensitive to expected changes in temperature and rainfall patterns. Current stream flows and water recharge are likely to change given climate change predictions. In terms of total annual runoff in the Usuthu River, different results of climate models under different scenarios predict an overall average reduction in runoff ranging from 2 to 6% in a normal year and to over 12% in dry years (which is equivalent to 134 million m<sup>3</sup>, see Figure 8)<sup>99</sup>. Simulations for the Ngwavuma catchment predict a reduction in annual runoff of between 4% and

<sup>98</sup> Knox, J.W., Diaz, R.J.A, Nixon, D.J., Mkhwanazi, M., 2010. A preliminary assessment of climate change impacts on sugarcane in Swaziland. *Agricultural Systems* 103: 63 – 72.

<sup>99</sup> Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

23%<sup>100</sup>. In the Mbuluzi catchment, changes in runoff are estimated to vary between an increase or decrease of 2% and in the Komati catchment, by an increase or decrease of 5%.

57. All models concur in predicting large seasonal variations in water availability in the country. For example, in the Usuthu Basin it is predicted that stream flow will be much higher in late spring to mid-summer due to flooding and will be reduced considerably during the winter droughts<sup>101</sup>. Simulation results show a water deficit from June to September in both the Komati and Ngwavuma catchments and from May to September in the Mbuluzi catchment<sup>102</sup>. As a result, water requirements in these catchments will barely be met during winter months. Furthermore, with more pronounced and frequent droughts projected in the future as a result of climate change, a reduction in rainwater infiltration and groundwater recharge is expected. The Swaziland's First National Communication (FNC, 2002) states that "Swaziland could experience a reduction in stream flows under all scenarios". It should be noted, however, that little recent and comprehensive research regarding climate change impacts on Swaziland's water resources has been undertaken to date. Additionally, downscaling results in uncertainty in the models and thus downscaled models will not necessarily provide sufficient information for decision-making related to adaptation. As such, there is currently insufficient data available in order to make definite predictions regarding the impact of climate change on Swaziland's water resources. The project will contribute to rectifying this situation by improving data collection.

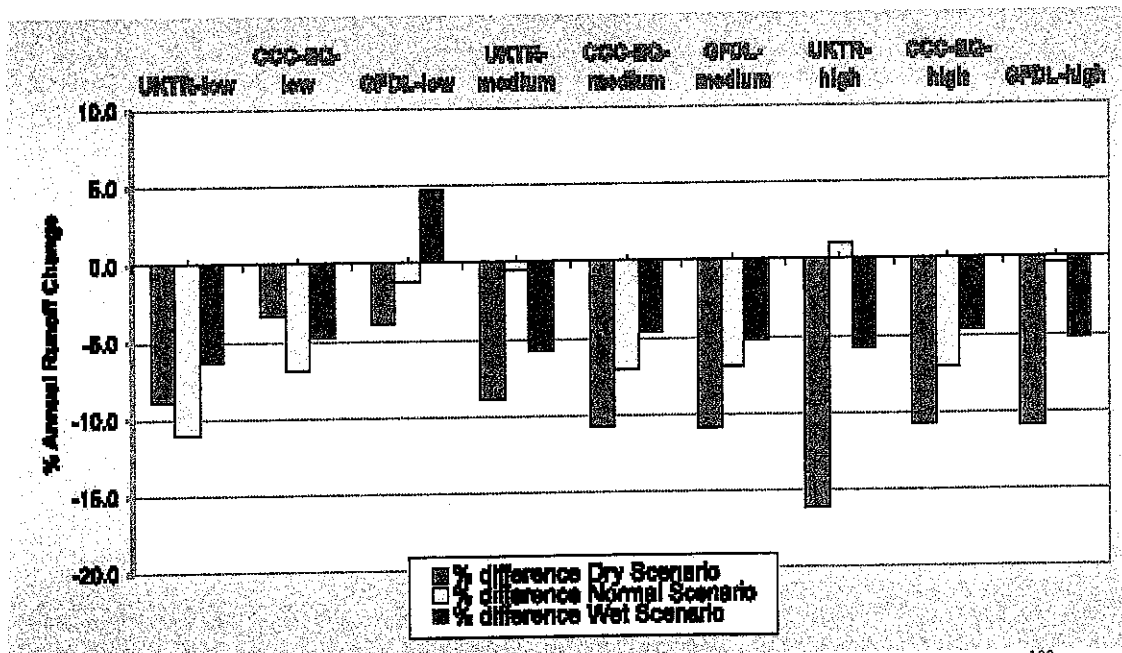


Figure 8: Average annual runoff change for Usuthu River under different scenarios<sup>103</sup>.

58. The impacts of the predicted seasonal changes in flow magnitudes (i.e. reduced flows in winter and increased flows in summer) are likely to make the joint management of water resources in the trans-boundary context (with Mozambique and South Africa) increasingly complex and challenging. Furthermore, the predicted variation in stream flows is likely to affect other sectors of the economy relying on water, particularly irrigated agriculture where large-scale irrigation of mono-crops (such as sugarcane) depend entirely on surface water. It is predicted that due to the impacts of climate change, irrigation demand within three sugarcane production areas (Mhlume, Simunye, and Big Bend, which represent 72% of total area) is projected to increase by 18% to

<sup>100</sup> Matondo, J.I., Peter, G. and Msibi, K.M., 2005. Managing water under climate change for peace and prosperity in Swaziland. *Physics and Chemistry of the Earth* 30 (2005): 943 – 949.

<sup>101</sup> Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

<sup>102</sup> Matondo, J.I., Peter, G. and Msibi, K.M., 2005. Managing water under climate change for peace and prosperity in Swaziland. *Physics and Chemistry of the Earth* 30 (2005): 943 – 949.

<sup>103</sup> Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

21% and the current peak capacity of existing irrigation schemes could fail to meet the predicted increases<sup>104</sup>. Therefore, without adequate adaptation to climate change in the water sector in Swaziland, water shortage-related problems could prevail by 2075 as a result of an expected growing population, raising water demand and decreasing stream flows.

#### *Climate change impacts on agriculture*

59. Agricultural production is very sensitive to variations in climate. The production of three important food crops (maize, sorghum and dry beans) has been assessed under the present climate as well as under projected future conditions in the year 2025<sup>105</sup>. The simulations were conducted for three sites; Big Bend, Malkerns and Mbabane, representing the Lowveld, Middleveld and Highveld respectively. The main results indicate an overall reduction in the yields of these three crops by 2025<sup>106</sup>. The yield of maize, the staple crop, is expected to decline by as much as about 60% in some areas and the Highveld may not be suitable for growing maize by the year 2025. However, the simulations show that if adaptation measures such as a change in planting dates are undertaken, maize yields may increase by as much as 35% in the Lowveld region. The simulations for sorghum indicate a decrease in the yield ranging from 8% to 78% across the regions with the exception for the Mbabane station in the Highveld, where the yield is expected to increase between 8% and 60%. For beans, a decrease in yield from 11% to 23% is also projected except at Malkerns in the Middleveld, where an increase from 38% to 191% is expected.
60. The predicted reduction in maize yields is likely to impact negatively on the country's capacity for food self-sufficiency and will therefore likely increase the need for highly priced imported maize. The poor are likely to find it increasingly difficult to access this staple crop, leaving them highly vulnerable to food insecurity. This situation is likely to increase the number of people depending on international food aid.
61. A preliminary assessment of the impacts of climate change on sugarcane production was undertaken in Mhlume, in the eastern Lowveld. The results indicated that sugarcane yields may increase by 15% in year 2050 compared to current levels<sup>107</sup> if the projected increase in irrigation demand is met (see paragraph 58).

#### *Climate change impacts on ecosystems*

62. The predicted warming and drying of Swaziland's climate is likely to result in detrimental changes to biodiversity and to the delivery of ecosystem services to local communities. A westward shift and shrinking in size of the regions presently covered by the subtropical moist forests (in the west) and subtropical dry forests (in the east) is projected. Furthermore, a tropical dry forest type is likely to emerge in the eastern flanks taking up as much as 20% of the total land area<sup>108</sup>. Stream flows, soil water content and ecosystem productivity are likely to decrease. This will reduce the supply of ecological goods and services (e.g. drinking water, wild fruits and vegetables, timber and medicinal plants). Enhancing ecosystem resilience to these predicted changes is of critical importance if the provision of ecological goods is to be maintained into the future.

<sup>104</sup> Knox, J.W., Diaz, R.J.A, Nixon, D.J. and Mkhwanazi, M., 2010. A preliminary assessment of climate change impacts on sugarcane in Swaziland. *Agricultural Systems* 103: 63 – 72.

<sup>105</sup> The Decision Support System for Agrotechnical Transfer (DSSAT3) comprehensive software system was used to simulate the yield of the three crops under present climatic conditions and under projected climatic and atmospheric conditions. Simulations were done using climatic patterns based on three climate simulation models; CCEQ, GFDL and UKTR.

<sup>106</sup> Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.

<sup>107</sup> Knox, J.W., Diaz, R.J.A, Nixon, D.J. and Mkhwanazi, M., 2010. A preliminary assessment of climate change impacts on sugarcane in Swaziland. *Agricultural Systems* 103: 63 – 72.

<sup>108</sup> Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002.



63. In a spatially explicit climate change impact assessment, future responses of the four major vegetation types in Swaziland (namely grassland, Lebombo Bushveld, Lowveld Bushveld and Sour Bushveld) were simulated. The results show that the projected spatial redistribution of the bioclimatic space appears to be considerable, particularly after 2050. Under the A2 and B2 (see paragraph 54) scenarios, more than 50% and more than a 25% of the total land area in Swaziland may experience warmer bioclimatic conditions towards the end of the 21<sup>st</sup> century, respectively. Grasslands and the Lebombo Bushveld appear to be particularly vulnerable to climate change. The Sour Bushveld is the only vegetation type that initially responds positively to warming but this will likely result in encroachment into the highly vulnerable grassland areas<sup>109</sup>. These changes are expected to have major negative impacts on biodiversity in the country.

#### *Climate change impacts on health*

64. The potential impact of climate change on health in Swaziland has not yet been modelled. However, it is well recognised that climate and weather are important components of complex ecosystems and with these changes; the dynamic balance between the living components of ecosystems is often disturbed. Ecosystem instability can result in changes in pathogen prevalence, altered pathogen transmission profiles, and increased host susceptibility. These instabilities can have dramatic effects on the health of humans and animals. Of great importance for Swaziland, are the projections of climate change scenarios for southern Africa that indicate an extension of malaria-prone areas, and, with summers lasting longer, more people could be exposed for longer periods to the risk of malaria. Furthermore, the prediction of higher frequency of heavy rainfall and floods events, particularly during summer, is also likely to increase the risk prevalence of waterborne diseases<sup>110</sup>.

#### **1.1 Climate change-induced problem**

65. Climate change is likely to place considerable strain upon Swaziland's water resources. Overall, a warmer and drier climate, with drier winters and wetter summers, coupled with the risk of more frequent and more intense floods and droughts, is predicted for Swaziland (see paragraphs 50 to 54). This changing climate will result in changes in stream flows and recharge rates, with large seasonal variations (see paragraph 56 to 58) and therefore have significant impacts on the quality and quantity of water in the country. As a result, hydro-electric power generation, agricultural production and sanitation will likely be directly affected with adverse consequences for food security, livelihoods, health and the country's overall economy. The agriculture sector has always been the dominant end-user of surface water (see paragraph 10). This pattern is likely to intensify with increasing requirements for irrigation brought on by higher temperatures and reduced rainfall, particularly with irrigated sugarcane (see paragraph 58). Furthermore, climate change-induced scarcity and variability of water resources has the potential to create competition among water-using sectors within the country and make trans-boundary water management increasingly challenging. As increasing variability and competing demands intensify under the effects of climate change, effective governance and planning for managing water demand for the sustainable use of water resources will become essential.
66. Against this background (see paragraph 65), the main climate change-induced problem facing Swaziland to be addressed by the project is that local communities, River Basin Authorities (RBAs) and national government institutions presently lack the technical capacity, climate change knowledge (including credible and verifiable data to demonstrate likely climate change impacts), management capacity as well as the physical and financial resources to overcome and withstand the anticipated climate change-related threats to water resources.

<sup>109</sup> Dlamini, W., 2010. Probabilistic spatio-temporal assessment of vegetation vulnerability to climate change in Swaziland. *Global Change Biology* 2010, doi: 10.1111/j.1365-2486.2010.02317.x.

<sup>110</sup> McMichael, A.J., Campbell-Lendrum, D.H., Corvalan, C.F., Ebi, K.L., Githeko, A.K., Scheraga, D.P., Woodward, A. (eds), 2003. Climate change and human health risks and responses. World Health Organisation, Geneva.

## **1.2. Root causes**

67. In addition to climate change being a major threat to water resources in Swaziland, a number of non-climate change-driven causes exist that are currently placing pressure on the availability of water resources in the country. Indeed, Swaziland faces a combination of factors that contribute to its vulnerability and weaken its adaptive capacity to current climate variability and climate change. These underlying causes of Swaziland's vulnerability are described below:

### **Non-climate change-driven root causes**

#### *Poverty*

68. Swaziland has high rates of poverty (approximately 63% of the population lives below the poverty line) and unemployment (approximately 40% of the Swaziland population is unemployed) (see paragraph 20). The majority of the rural poor have limited access to clean drinking water and adequate sanitation (see paragraph 10). It is the poor and marginalised communities which are the most vulnerable to climate change impacts because they are particularly sensitive to, and have the least capacity to adapt to, such impacts. For example, as traditional irrigation/water-collection methods fail, people from poor communities are not equipped with the resources to provide alternatives (such as drilling new boreholes or buying water from vendors). In addition, poverty prevents rural Swaziland communities from investing in appropriate adaptation practices and infrastructure (such as rainwater harvesting and drip irrigation technologies) in order to cope with expected climate change impacts. This inherently low capacity to adapt increases the vulnerability of Swaziland communities to climate change.

#### *HIV/AIDS and other diseases*

69. The spread of HIV/AIDS and other infectious diseases represents a key factor that is having a profound impact on communities and economic development in Swaziland. Not only has the HIV/AIDS epidemic resulted in a significant loss of human capital but it has also diverted resources (e.g. financial, technical), which could have been otherwise used to strengthen development in the country. For the period 2003 – 2011, it was projected that, as a consequence of HIV and AIDS, 13,000 teachers instead of the initially projected 5,093 would be required to maintain the 1997 education level, at an additional training cost exceeding US\$ 60 million<sup>111</sup>. In 2001, a study revealed that three ministries, namely the: i) Ministry of Finance (MOF); ii) Ministry of Economic Planning and Development (MOEPD); and iii) Ministry of Public Service and Information (MOPSI) will lose 32% of their work force to HIV/AIDS over the next 20 years and will therefore need to replace an additional 1.6% of their staff complement each year over the same period to maintain staffing levels<sup>112</sup>. Overall, by 2016, as much as 8% of Swaziland's GDP will be devoted to training workers to replace those who have died as a result of AIDS<sup>113</sup>.

70. The high prevalence rate of HIV/AIDS has reduced the productivity at both national and local levels. Through its influence on health and livelihoods, infectious diseases reduce the capacity to cope with and adapt to the impacts of climate change and consequently increase vulnerability. Indeed, HIV/AIDS has created a new category of highly vulnerable households, such as child-headed and elderly-headed households and as a result exacerbates the effects of drought on rural

<sup>111</sup> Government of Swaziland, Ministry of Education. 1999. Assessment of the impact of HIV/AIDS on the Education Sector. Mbabane.

<sup>112</sup> Government of Swaziland. 2002. Assessment of the Impact of HIV/AIDS on the Central Agencies of the Government of the Kingdom of Swaziland: Executive Summary. Mbabane.

<sup>113</sup> UNDAF Complementary Country Analysis. The Kingdom of Swaziland, 2009

communities by substantially increasing the number of households in need of food aid (see paragraph 15).

71. The devastating effects of HIV/AIDS are further exacerbated by poor public health care systems and by the spread of other diseases that are endemic to the region, particularly malaria. Furthermore, diseases which cause infant mortality in the country also constrain access to both safe water supply and improved sanitation<sup>114</sup>. Overall, the HIV/AIDS prevalence in Swaziland, whilst significantly affecting development, has reduced adaptive capacity and exacerbated inherent vulnerabilities to climate change impacts.

#### *Dependence on rain-fed agriculture*

72. At present, rain-fed agriculture, predominantly maize production is the main livelihood of the majority of rural households in Swaziland due to the lack of access to appropriate irrigation technologies. Maize production is therefore subjected to adverse weather conditions and is adversely affected during periods of drought and consequent water shortages during the dry season (see paragraph 46). As a result, a large number of rural households suffer from food insecurity and are reliant on food aid. Overall, the high dependence on rain-fed agriculture and the lack of appropriate irrigation technologies significantly limits agricultural productivity and contributes to the vulnerability of rural Swaziland communities to climate change.

#### *Land degradation*

73. Large-scale land degradation, which reduces water supply and quality, is widespread across the country but most particularly in the Upper Middleveld and the Lower Middleveld<sup>115</sup> and is attributable to episodes of heavy rainfall, steep slopes, over-grazing and consequent soil erosion. This situation is compounded by: i) the unsustainable activities undertaken by rural communities in Swaziland, such as the high levels of deforestation<sup>116</sup>; ii) the unsustainable agricultural techniques employed (e.g. absence of crop rotation, inadequate fallow period between crops as well as improper application of fertilizers, herbicides and insecticides); and iii) overgrazing. Land degradation also affects food security and livelihoods of Swaziland communities through the reduction of agricultural productivity, thereby rendering communities more susceptible to predicted climate change impacts.

### **1.3 Long-term solutions and barriers to achieving the solutions**

74. In the light of the above-mentioned climate change-induced problems and root causes, the preferred solutions (normative situation) for managing the likely consequences of climate change on water resources have been identified, as have the barriers that need to be overcome in order to achieve the normative situation. These are detailed below.

#### **Preferred solutions**

#### ***Institutional capacity for Integrated Water Resource Management (IWRM) in the context of climate variability and change is strengthened***

75. The preferred solution would see institutional capacity in Swaziland strengthened in order to facilitate effective adaptive management of the country's water resources under changing climatic

<sup>114</sup> Second progress report on the achievement of the Millennium Development Goals, Government of Swaziland, 2007.

<sup>115</sup> Swaziland Environmental Action Plan (SEAP) 1997. During the PPG Phase, extensive large areas of land degradation and soil erosion were observed in the sites visited, i.e. Mkhweni Inkhundla, KA-Shewula, Mananga (see Annex 9 for the field visit report).

<sup>116</sup> Swaziland Environmental Action Plan (SEAP) 1997. Nationwide, it is estimated that the total annual wood consumption exceeds the total sustainable wood supply by about 30%. Indiscriminate bush fires also exacerbate deforestation.

conditions. This would also ensure sustainable and equitable national and trans-boundary IWRM. This would entail undertaking extensive capacity building and awareness raising activities of the relevant ministries, government agencies, stakeholders and institutions involved at various scales (national, regional and local) in IWRM. Additionally, the preferred solution would also see the implementation of a national platform and coordinating mechanism that ensure that all relevant stakeholders are collaborating and sharing information/data for IWRM for the sustainable supply and quality of water resources in the country under a changing climate. Furthermore, the preferred solution would see climate change risks integrated into Swaziland's position on trans-boundary water resource management.

***Climate risks are integrated into local, national, regional policies, plans and legislation that affect IWRM***

76. The preferred solution would see that climate risk management is integrated into key policies, plans and legislation for a sustainable long-term solution to achieving adaptation in the water sector at local, national and regional levels. Specifically, the preferred solution would see: i) a National Climate Change Policy developed and ratified; and ii) the improved Chiefdom Development Plans (CDPs), SWADE Comprehensive Mitigation Plans (CMPs), National Water Policy, Integrated Water Resources Master Plan (IWRMP) and a land use planning policy adopted that fully account for climate change risks thereby climate-proofing the management of national and trans-boundary water resources.

77. The preferred solution would also entail the adoption of a flexible and adaptive management process whereby policies, plans and legislation are developed based on current knowledge of climate change risks. In addition, the preferred solution would ensure that provisions are made for review as and when information is updated and the understanding of climate change risk is deepened.

***Local capacity is strengthened to successfully respond to the climate change risks affecting water resources and agricultural production***

78. The preferred solution would see local capacity strengthened to effectively respond to and manage the climate change risks threatening water resources, agricultural production and livelihoods. Additionally, communities will be equipped with the knowledge of and appropriate infrastructure associated with innovative climate change adaptation responses (e.g. rainwater harvesting, sand dams and means to artificially increase rainwater infiltration rates), which will improve IWRM under a climate change scenario at a local level.

***Degraded ecosystems, including forests, are restored to improve water supply and quality***

79. The preferred solution would see forests and ecosystems restored through both an elimination of the anthropogenic pressure (inappropriate land uses) placed on them as well as through extensive restoration and re-planting in river basins. Newly established and restored riparian forests are able to effectively generate stream flows, protect water quality, and reduce erosion and flooding and thus facilitate appropriate river basin management and improve the resilience of basins to climate risks. Additionally, improving river basin management in such a way would enhance biodiversity conservation and also improve income generation of local communities. In so doing, restoration and rehabilitation activities will improve the resilience of communities to anticipated climate change impacts through the improvement of ecosystem services and income streams.

80. In order to achieve this, the preferred solution would see more awareness raising activities regarding the ecological importance of the restoring riparian forests within the communities dependent on forests, woodlands and watercourses. Additionally, alternative livelihoods would be introduced to improve community income streams and reduce the pressure placed on the forests.

## **Barriers**

### ***Limited knowledge and capacity to fully assess risks posed by climate change to water resources in Swaziland***

81. At present, information related to the likely impacts of climate change on Swaziland's water resources is insufficient to allow for adaptive planning and management. Although climate change is recognised as a major impediment to successful development, the existing information base on which the government can make adaptation decisions is limited. There have been a few preliminary assessments to understand the impact of climate change on the hydrological regimes (see paragraph 56) but they were based on a limited database and provide generic findings. Additional in-depth studies are required to further specify the climate change risks to water supply and quality throughout the country. Additionally, Swaziland does not have a clear policy on how to manage impacts of climate change within the water sector.
82. Institutional and technological capacity within government agencies to cope with climate change risks is generally inadequate<sup>117</sup>. Furthermore, all major development projects run by the various government agencies fail to integrate climate change risks because of the lack of knowledge and awareness of climate change impacts<sup>118</sup>. Thus, there has been little progress to build the adaptive capacity of communities to cope with current climate variability or the risks associated with future climate change impacts.
83. Under the Water Act and draft Water Policy, Swaziland has, in line with internationally accepted IWRM principles, shifted to a more decentralised approach to water management. The RBA's (established in 2009) have a far-reaching mandate for water resources management in their respective catchment areas, including the issuing, renewal, amendment or suspension of water permits. This puts the RBAs at the heart of critical planning and allocation decisions over the country's water resources. At present, the RBAs lack the necessary financial and technical capacity to effectively integrate projected climate change impacts on the country's water resources into long-term planning (and hence allocation decision-making).
84. With all of Swaziland's surface water resources being in basins shared with neighbouring Mozambique and South Africa, long-term water security in Swaziland depends on the sustainable management of the resources at trans-boundary level. At present, the projected climate change impacts on the shared resources have been only inadequately considered, if at all. Further increased flow variability or overall reduction in flows due to climate change, combined with the growing demands for water in all three countries, is likely to reduce the basket of options for water allocation and sharing between the riparian states. A sound understanding of climate change impacts and the resulting consequences for trans-boundary water management options is therefore critical. However, at present there is no coherent long-term trans-boundary water management strategy for Swaziland in general and climate change tends to be inadequately considered in trans-boundary water resources planning and agreement negotiations.

### ***Poor quality of hydrological and climate-related data***

85. There is lack of a centralised water resource management information unit and system to ensure efficient and integrated data capture, storage, sharing and management. Additionally, hydrological data is limited for effective analysis of projected climate change impacts. The country has limited updated database and information for: i) groundwater resource availability, ii) rural water supply

<sup>117</sup>Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002. Additionally, information was obtained during consultations of key government departments from 8<sup>th</sup> October 2010 to 9<sup>th</sup> November 2010 (see Annex 5).

<sup>118</sup> Information obtained during consultations of key government departments from 8<sup>th</sup> October 2010 to 9<sup>th</sup> November 2010.

and sanitation schemes; and iii) land use mapping. This is a major limiting factor in producing effective analyses of available information to establish trends and forecasts for informed decision-making and for better understanding of the impacts of climate change<sup>119</sup>.

86. Swaziland does not have sufficient historical climate data to reliably construct past climates<sup>120</sup> and therefore the effectiveness of assessments of climate change and downscaled projections are limited. Weather stations are not adequately distributed in the country to provide localized and accurate information to all communities<sup>121</sup>.

### ***Limited national dialogue dedicated to addressing water needs under changing climatic conditions***

87. Currently, there is very little focused dialogue in Swaziland within national institutions on expected climate change impacts on water resources or on the combined impact of current development plans and climate change on water resources. As a result, climate risks have not been adequately integrated into national plans and policies regarding IWRM, and effective adaptation, at all levels, has hindered and institutional capacity for IWRM remains low.

## **2. Strategy**

### **2.1. Project rationale and policy conformity**

#### *Project rationale*

88. Swaziland's FNC (2002) highlights that water resources, particularly those in river basins shared with neighbouring countries, are highly vulnerable to the negative impacts from climate change. Additionally, a present government priority is supporting policy interventions and strategies that address climate change through an IWRM approach. The project will focus on addressing the 'additionalities' that emerge in the face of climate change and plan to integrate them into ongoing IWRM implementation efforts by the GoS. Overall, the project will contribute to minimising the expected adverse impacts of climate change on the country's water resources as well as on the livelihoods of local communities. This will occur via the implementation of a set of measures and activities that promote the adoption and implementation of sustainable and equitable national and trans-boundary IWRM that takes into consideration current climate variability and projected climate change. The project will achieve this by: i) promoting informed and inclusive national dialogue focused on water needs, vulnerability to climate change and water allocation in Swaziland; ii) integrating climate change risk management into the implementation of national policies and water and agricultural programmes to promote adaptation on a wider scale; and iii) integrating climate change risks into Swaziland's position on trans-boundary water management for the Incomati, Maputo and Umbeluzi<sup>122</sup> river basins. In so doing, the project will also increase knowledge and awareness on the efficacy of innovative water management techniques, practices and tools under climate change conditions and therefore strengthen adaptive capacity at both the national and local levels in Swaziland. Additionally, the project will contribute to strengthening the climate risk management capacity of local level users as well as decision-makers both at the community and RBA<sup>123</sup> level. This will be achieved through climate change-related training

<sup>119</sup>Information obtained during the meeting between NC and Mr. Dlamini Emanuel, Director of the National Meteorological Services on the 8<sup>th</sup> November 2010 (see Annex 5).

<sup>120</sup>Swaziland's First National Communication to the United Nations Framework Convention on Climate Change, 2002

<sup>121</sup>The closest station to the LUSIP project communities in Ngwavuma Basin is at Big Bend which was found to be too far downstream with very different conditions to the LUSIP site (information gathered in a meeting with SWADE and LUSIP on the 6<sup>th</sup> December 2010; see Annex 5).

<sup>122</sup>This is the terminology under which these shared river basins are internationally known. Internally, Swaziland divides these three basins into the seven sub-basins referred to in other sections of this project document.

<sup>123</sup>Under the Swaziland Water Act in future, all licensing decisions will be made through the RBAs.

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activities and practical demonstration projects and will enable informed decision-making on the management and use of water resources.

89. Outcome 1 will contribute towards strengthened institutional capacity for climate change adaptation and the integration of climate change risks into key national policy documents by:

- Defining strategic knowledge gaps on climate change impacts on the water sector and carrying out targeted research to fill the identified knowledge gaps.
- Identifying a set of tailor-made climate change response measures related to national and trans-boundary water management in Swaziland and integrating it into key national level policies
- Identifying institutional needs to inter-sectoral coordination through a series of policy dialogues and strengthened the capacity of strategic institutions through targeted training.

90. Under Outcome 2, the project will integrate climate change risk management into key strategic national water and agricultural programmes as well as implement priority adaptation measures in demonstration sites to pilot risk management measures on the ground. This will be achieved partly through the demonstration of appropriate IWRM-related adaptation measures in order to catalyse policy implementation. Key activities include:

- Developing guidelines for mainstreaming climate change risks into key national policies
- Developing toolkits on practical application of climate change response measures
- Integrating tailor-made climate change response measures into major management/investment plans
- Strengthening the capacity of stakeholders by incorporating modules on climate change risks/ response measures into ongoing training programmes.
- introducing rainwater harvesting techniques in demonstration sites; and
- increasing rainwater infiltration through improved land use practices and water basin management.

91. Outcome 3 will assist Swaziland's negotiators in trans-boundary water negotiations in defining the long-term trans-boundary water management objectives of the country giving full consideration to climate change aspects and in developing scientifically informed positions for the forthcoming negotiations. Key activities include:

- undertaking a targeted assessment of climate change impacts on trans-boundary water management;
- developing a strategy paper mapping out short-, mid-, and long-term objectives of Swaziland with respect to trans-boundary water management in the light of changing climatic conditions;
- developing a position paper informing Swaziland delegations to Incomati/ Maputo and Umbeluzi negotiations (respectively) on options for integrating climate change aspects into agreement negotiations;
- developing targeted information briefs on projected climate change impacts on trans-boundary water resources management for relevant decision-makers at technical and political levels across all relevant sectors; and
- developing awareness raising material for relevant stakeholder (user) groups on short-, mid- and long-term impacts of climate change on trans-boundary water management and allocation regime.

92. A particularly innovative on-the-ground demonstration (Outcome 2) to integrate climate risk management into river basin management practices will be restoring degraded sub-catchments by planting multi-use indigenous trees to ultimately form hyper-beneficial, and biodiversity rich

forests<sup>124</sup>. The forests will be hyper-beneficial in that they will provide additional fruit, fiber, fodder, timber and medicinal plants relative to natural forests. They will be exceptionally biodiversity rich because of the wide range of species planted. And they will provide all the normal water-related benefits of a forest such as stabilising soils and promoting infiltration of rainwater. As a result, erosion will be reduced and water quality in rivers will be improved as a result of reduced silt loads. Tree species selected for the restoration will be chosen based on their utility for communities, but also for their drought resilience, carbon sequestration rates and capacity to bind soil in the face of intense rainfall events. In this way, the forest restoration will be tailored to mitigate the expected negative impacts of climate change on movement of water across the landscape and into soil profiles. It will consequently be a model example of ecosystem-based adaptation<sup>125</sup>, improving biodiversity levels as well as availability of water to local communities, despite climate change impacts. The potential opportunity of generating carbon income streams via carbon sequestration in these forests will also be investigated within the project.

93. The on-the-ground demonstrations will be used to train local communities on appropriate adaptation interventions that reduce the climate change risks and consequently the vulnerability of communities. This will be via increased awareness of climate change impacts. In addition, lessons learned from the demonstrations will be used to inform mainstreaming of adaptation into policy implementation at a national level. The results from the demonstrations will be disseminated to the NCCC/NMS/SEA to inform policy across the full range of relevant line ministries. In this way, the NCCC will promote the development of dynamic, learning organisations that respond to new and updated information in an effective and rapid manner. Climate change information and knowledge on how to adapt is evolving rapidly and consequently this type of rapid adaptive management is of the utmost importance.
94. By promoting climate-resilient development of the water sector within Swaziland, with positive impacts for the country's agriculture sector, the project will directly contribute to the achievement of Swaziland's MDGs, particularly Goal 1 (extreme poverty and hunger eradication), and Goal 7 (environmental sustainability).

#### *Policy conformity*

95. The Swaziland Draft Water Policy (NWP, 2009) is the central water-related policy in the country, which together with the IWRMP and Swaziland Water Act guides all water resources management and planning in the country. The draft NWP recognises that "sustainable development and management of water resources shall take cognisance of likely effects and impacts of climate change". The policy calls for *inter alia*:
- conducting research to determine effects and impacts of climate change on water resources;
  - integrating into water resources planning outputs of research on climate change; and
  - developing appropriate integrated adaptation strategies for climate change.
96. The project directly responds to the above in supporting research and data gathering to address gaps in available climate and hydrological data and modelling. In supporting the strengthening of the NCCC and water management bodies at different levels, including community level, the

<sup>124</sup> Hyper-beneficial and biodiversity-rich forests include a variety of tree species that provide not only the ecological benefits of natural landscape but also a large variety of food, fruits, timber, medicine and spices for the livelihoods of the communities. There are examples of successful implementation by local communities over hundreds of years in Sri Lanka and in South America. (see Hochegger, K. (1998). *Farming like the forest: Traditional home garden systems in Sri Lanka*. Tropical Agroecology 191, Margraf Verlag, Weikersheim, Germany, 203pp or Halladay, P. and D.A. Gilmour (Eds.) (1995). *Conserving biodiversity outside protected areas: The role of traditional agroecosystems*. IUCN, Gland, Switzerland, and Cambridge, UK, pp. viii + 229pp.)

<sup>125</sup> Ecosystem-based adaptation: An approach for building resilience and reducing risk for local communities and ecosystems, 2008. A submission by IUCN to the Chair of the AWG-LCA with respect to the Shared Visions and Enhanced Action on Adaptation. Available from: <http://unfccc.int/resource/docs/2008/smsn/igo/029.pdf>



project corresponds to the policy's call for integrating climate-related information into water resources planning in practice. In particular, the project supports the development of coherent trans-boundary water management objectives for Swaziland and a strategy to integrate climate change consideration into trans-boundary water resources agreement negotiations. These research and management related aspects are complemented by the development and implementation (in demonstration sites) of practical climate change adaptation measures as called for by the Draft Water Policy.

97. In addition to the Draft Water Policy, the project is in line with a range of other development and national resources management policies in Swaziland, which directly or indirectly promote the greater integration of climate change aspects into resources management and development planning (e.g. the Poverty Reduction Strategy; Agriculture Sector Policy, Food Security Policy and National Disaster Risk Management Policy). In supporting the improved integration of climate change aspects into an IWRM based water management framework, the project encourages improved cross-sectoral planning and management of water and related natural resources such as land and contributes to improved climate resilience at local, national and trans-boundary level.

#### **SCCF conformity**

98. The SCCF was created to address the needs of developing countries under the UNFCCC with the overall objective of funding long-term adaptation measures that increase the resilience of national development sectors to the impacts of climate change. The project conforms to the SCCF's eligibility criteria, namely: i) country-drivenness; ii) additionality; iii) catalytic nature of work; and iv) capacity building as described below:
- **Country-drivenness:** By contributing to the adoption and implementation of improved IWRM practices and thereby reducing vulnerability to climate change, the project is fully in line with the national priorities of GoS as set in many of the country's policies (see above). In particular, the project contributes to the achievement of the overall country sustainable development aspirations as stated in the NDS (1999). Additionally, to ensure country ownership of the project, a participatory approach was undertaken through extensive stakeholders' consultations in order to select appropriate activities for the project. (Minutes of the meetings conducted with stakeholders can be found within Annex 5. The Inception Workshop report is contained within Annex 6 and the field mission report is in Annex 9. Additionally, the project was validated through a validation workshop with relevant stakeholders, the minutes of which are contained within Annex 10.)
  - **Additionality:** The project is designed to remove key barriers and constraints which are currently hindering adaptation to climate change within Swaziland's water sector. Importantly, the focus of the project is to address the additional cost of ensuring that climate risk management is integrated into key sector policies, systems and practices. In particular, the project will contribute to integrating climate change risks into the ongoing IWRM implementation underway by the GoS as well as into the negotiations on trans-boundary water management with neighbouring countries. At present, water and land management programmes do not specifically address climate change adaptation. The project will also contribute to the integration of climate change risks into key local, national and regional policies, plans by improving awareness regarding climate change risks and thereby assist vulnerable populations in building their resilience to anticipated climate change impacts.
  - **Catalytic nature of work:** The project's interventions are built around three key strategic investments plans (namely KOBWA, LUSIP and KDDP) which provide entry points for integrating climate risk management into current and future planning and investment plans. Additionally, interventions will be monitored and their success will be documented and disseminated in order to catalyse up-scaling within Swaziland and, indeed, neighbouring countries. The capacity building efforts to be undertaken by the project will aid in the up-scaling and replicating of successful project interventions.

- **Capacity building:** The project supports capacity building, including institutional strengthening, and awareness raising around the likely implications of climate change for Swaziland's water resources and ways in which to adapt effectively to the likely impacts. Capacity building will be undertaken for the following stakeholders: i) key government agencies including: MNRE (DWA, NWA), MTE (NCCC, METS) and MOA (SWADE), SEA, NDMA; ii) decentralized water institutions including SZWP, RBAs, IDs, and WUAs; and iii) local communities.

### **Overall GEF conformity**

99. The project has been designed to meet the following overall GEF requirements in terms of implementation and design:

- **Sustainability:** The project's activities are designed to improve the generation of information critical for decision-making and policy dialogue related to climate change adaptation in the water sector as well as to strengthen institutional capacity and improve coordination for IWRM of government institutions involved in water management. Furthermore, the project supports on-the-ground demonstrations of innovative climate-proof water management practices. In so doing, the project will contribute to building adaptive capacity at all levels and developing the evidence base to make the case for greater levels of investments in adaptation. This is consequently beneficial beyond the project lifetime for the sustainable management of water resources as well as for future projects within Swaziland. In addition, the project is aiming to adjust regulatory tools and policies for water resources management that will catalyse adaptation action by the private sector. Furthermore, schools are the selected sites for the demonstrations activities, which will build the awareness of future generations on climate change impacts and effective adaptation (see Section 2.7 on Sustainability for more information).
- **Replicability:** The project will generate important documentation of studies, analyses and best practices, which will be widely disseminated through workshops and existing knowledge networks in the country. Additionally, best practices and documentation from the entire project will be disseminated globally via the UNDP's Adaptation Learning Mechanism (ALM) and wikiADAPT, which will facilitate the replication of the project's successes at the national, regional and global levels. Furthermore, the extensive training and capacity building of local communities and technical staff regarding adaptation measures undertaken by the project will contribute to ensuring the success of the project interventions into the future and will make it more likely that they will be replicated and/or up-scaled (see Section 2.8 on Replicability for more information).
- **Monitoring and evaluation (M&E):** The project design includes an effective M&E framework, which will enable ongoing monitoring of the project's activities, ensure that lessons learned are disseminated by producing regular progress reports for stakeholders. See Section 6 M&E for more information.
- **Stakeholder involvement:** The project design was formulated as a result of extensive stakeholder consultations (minutes of the meetings conducted with stakeholders can be found within Annex 5. The Inception Workshop report is contained within Annex 6 and the field mission report is in Annex 9) and will ensure the involvement of stakeholders during project implementation and monitoring (see the Stakeholder Involvement Plan in Annex 2).
- **Gender equality:** The project will pursue a gender-sensitive approach in all aspects of the project's activities and management. The conscious representation of women in the project's community-based activities, including training, and in the introduction of adaptation measures for water management will be encouraged. In addition, to monitor the effective mainstream of gender in the project, gender-disaggregated indicators for the project monitoring will be developed and used where relevant (see the Project Results Framework, Section 3).

### **2.2. Country ownership: country eligibility and country drivenness**

100. Swaziland ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 7 October 1996 and is classified as a Non-annex 1 country. The country

submitted its FNC in May 2002, and the preparation of the Second National Communication (SNC) began in January 2007. As a result, the country is eligible for financial support under Annex 1 of the UNFCCC, and technical assistance from UNDP. The country is also a signatory to the United Nations Convention to Combat Desertification (UNCCD), and the United Nations Convention on Biological Diversity (UNCBD).

101. Under these multilateral environment agreements (MEAs), Swaziland is committed to implementing environmentally sound policies and practices for sustainable development. To honour Swaziland commitments, the GoS developed its long-term development strategy (NDS, 1999) and its environment action plan (SEAP, 1997) to ensure the integration of environmental concerns into the main policies and sectors. At present, policies and regulatory mechanisms related to the management of natural resources (e.g. land, water and forests), i.e. those potentially critical for achieving environmentally and socially sustainable development, are at varying stages of revision.

#### *Linkages with CP/GCF/RCF, CCA and UNDAF*

102. This project is designed to be strongly linked to one of the four programme areas of UNDP's Global Cooperation Framework (GCF), namely 'environment and energy'. UNDP GCF's main goal under this programme is centred on achieving MDG 7 ('ensure environmental sustainability') by promoting the integration of the principles of sustainable development into country policies, and programmes in order to reverse the loss of environmental resources and biodiversity. In addition, the project is consistent with the UNDP Country Programme (CP) aimed at strengthening national capacity to develop and coordinate a multi-sectoral response to the impacts of climate change within Swaziland. The Swaziland Complementary Country Analysis (CCA) recognizes that the country is facing increasing water shortages and that climate change is likely to further exacerbate this problem. As a result, the United Nations (UN) in Swaziland will support the country, through the United Nations Development Assistance Framework (UNDAF) (2011 – 2015), in a number of areas, including climate change adaptation. The project will contribute to Outcome 2 of the UNDAF, namely 'increased and more equitable access of the poor to assets and other resources for sustainable livelihoods', as well as to Outcome 3 of Swaziland's Country Programme, namely 'environmental sustainability improved'.

### **2.3. Design principles and strategic considerations**

#### *Linkages to national policy processes*

103. The project is linked to the Swaziland IWRM policy process, marked by the adoption of the new Water Act in 2003 which sets out a participatory and decentralised structure of decision-making to facilitate delivery and management of water resources in the country (see paragraph 24). To date, the national IWRM policy process is advanced to a point where: i) a draft National Water Policy (NWP) is expected to be accepted by parliament in the near future; ii) an Integrated Water Resources Master Plan (IWRMP) is also expected to be accepted in the near future; and iii) the NWA and river basin institutions (RBAs, IDs, WUAs) have been established. In addition, Swaziland is also engaged in trans-boundary water management negotiations with neighbouring countries for: i) the revision of the 2002 Interim Inco Maputo Agreement (IIMA) which governed the use of the Incomati and Maputo Rivers; and ii) a new agreement on management and use of the Umbeluzi water resources (paragraph 33).
104. The project is supporting the IWRM policy process to ensure that informed national policy dialogue regarding IWRM that takes into consideration climate change risks takes place. Through Outcome 1 and Outcome 2, the project will contribute to strengthening institutional capacity to facilitate effective adaptive management of the country's water resources under changing climatic conditions at all levels. In addition, the project will support on-the-ground demonstrations of effective and efficient water management techniques through Outcome 2, to

contribute to improving the resilience of vulnerable rural communities. Lessons from these demonstrations will inform policies developed by the NCCC. The project, through Outcome 3 will further ensure that Swaziland develops a coherent short-, mid-, and long-term position on trans-boundary water resources that adequately integrates climate change considerations.

*Project linkages with ongoing country interventions*

105. The project will work in conjunction with and benefit from other ongoing project interventions in Swaziland in order to avoid the duplication of project efforts and to benefit from synergies. Of particular relevance are the following projects:

- **Komati Downstream Development Project (KDDP):** KDDP is an irrigation project underway in the northern semi-arid Lowveld region of Swaziland, implemented by SWADE. The overall objective of the KDDP is to alleviate poverty and improve the livelihoods of rural communities by providing irrigation water for the development of 7,400 ha of irrigated farms downstream of the Komati River for the production of sugarcane (5,500 ha) as well as fruits and vegetables (1,900 ha), using water from the Maguga dam (See Annex 7 for further information). The project cost is US\$ 78 million and is funded by the Government of Swaziland, participating smallholder farmers and the private sector.
- **Lower Usuthu Smallholder Irrigation Project (LUSIP):** With an overall budget of US\$ 122 million, the LUSIP is also implemented by SWADE and aims to support the development of irrigated farms on 11,500 ha through the construction of three dams to form an off-river reservoir to store water diverted from floods in the wet season in the Usuthu River. During Phase 1, the dams will be constructed and 6,500 ha of agriculture land will be irrigated. Phase 2 will involve the development of an additional 5,000 ha of irrigated land through the extension of the irrigation canal system in the Matata area. (See Annex 7 for further information).
- **Lower Usuthu Smallholder Irrigation Project-GEF (LUSIP-GEF):** The LUSIP-GEF builds onto the LUSIP by focusing mainly on the area close to LUSIP, which will remain rain-fed and potentially at risk of exacerbated degradation due to the consequences of the LUSIP. The objectives of the LUSIP-GEF are to reduce land degradation, biodiversity loss and mitigate climate change through the application of sustainable land management (SLM) practices, which will in turn contribute to adaptation to and mitigation of climate change. The project has a budget of just under US\$ 11 million and started in 2011 for a period of four years. The International Fund for Agricultural Development (IFAD) is the GEF executing agency and the national implementing partners are MOA and SWADE (See Annex 7 for further information).

106. Key entry points for collaboration with the abovementioned projects are as follows:

- **Capacity building:** The project intends to strengthen technical capacity on the impacts of climate change on water and agriculture and how to maximise efficiency in irrigation infrastructure and technology under climate change to technical personnel, such as engineers involved in both the KDDP and LUSIP projects.
- **Training of trainers:** The project also proposes to provide all extension and training officers within both KDDP and LUSIP with extensive training on climate change awareness and adaptation. This is expected to facilitate the integration of climate change on all training modules within these projects.
- **Facilitation of the integration of climate risks into local development plans:** Comprehensive Mitigation Plans (CMPs), which are predominately environmental management plans, are being prepared under KDDP and LUSIP. The LUSIP-GEF project is expected to develop Chiefdom Development Plans (CDPs) in areas not covered by LUSIP. The project intends to team up with these initiatives to facilitate the integration of climate change risks and IWRM principles into the CMPs and CDPs.

107. At the outset of the project, a project managers' coordination working group will be established comprising managers from the abovementioned projects in order to coordinate efforts, develop synergies and avoid overlap. Such a working group will meet on an annual basis during project implementation.
108. Furthermore, the following will serve as parallel co-financing for the project. Co-financing letters are included within Annex 11.
- **KDDP, LUSIP, and LUSIP-GEF (SWADE):** These projects will undertake capacity building to enable communities to deal with the changing physical environment by building coping and adaptation skills and mechanisms. Additionally, the projects will provide potable water at the household level and improve sanitation and environmental management practices within the project areas. The co-financing amount will be quantified as much as possible as the project implementation progress.
  - **KOBWA:** The Komati Basin Water Authority (KOBWA) has set aside funds to implement initiatives aimed at empowering and building capacity in communities in the Komati Basin to enable communities to actively participate in water and environmental management activities. These initiatives will be supporting the project in particular by creating awareness of climate change in schools within the Komati River Basin and by empowering basin stakeholders to withstand climate change risks (e.g. flooding risks) through the development and implementation of community preparedness and action plans. Parallel co-financing from KOBWA of US\$34,000 will be allocated to the project.
  - **DWA:** The DWA is to allocate funds towards strengthening river basin institutional capacity to competently manage water resources, finalise the water policy and IWRMP as well as ensure effective and sustainable water resource management in the country. Parallel co-financing from the DWA of US\$4,530,900 will be allocated to the project.
  - **UNDP:** The UNDP Country Office (CO) within Swaziland is presently supporting the development of Swaziland's National Climate Change Strategy. The budget for this is US\$60,000. Additionally, the UNDP-CO is supporting the GoS to strengthen four sectors, namely: water and water sanitation, agriculture, health and education. In addition to this, the UNDP-CO will be building capacity for poverty reduction monitoring and the attainment of development targets (e.g. the MDGs). Parallel co-financing of US\$ 1.06 million will be allocated to the project. (This is in addition to the cash contribution of UNDP Swaziland CO to the project allocated for the project management activities.)

#### *Demonstration site selection*

109. The project will implement priority interventions at specific locations within the three international river basins in the country. The demonstration sites were identified through an extensive consultative process held at both the national and community levels. During the Inception Workshop (held on 18 November 2010 in Ezulwini), participants were divided into three groups representing the three international river basins (namely Maputo, Umbulezi and Incomati) to identify a list of potential demonstration sites for the project and rank these sites according to importance (See Annex 6 for the Inception Workshop Report).
110. During the ranking exercises at the workshop, ten criteria were used to assess the vulnerability to climate for the selection of the demonstration sites, namely: i) poverty level ii) access to safe drinking water; iii) reliance on rain fed agriculture; iv) frequency of floods; v) frequency of droughts; vi) land degradation; vii) presence of aquatic alien plants; viii) presence of terrestrial alien plants; ix) incidence malaria and waterborne diseases; and x) ongoing relevant projects. The Maputo River Basin group recommended both the Lusufu and Ngwavuma River Basins. The Umbulezi River Basin Group identified five sites without a specific recommendation. The Incomati River Basin Group also proposed five sites in the Lomati and Komati River Basins without recommendations (See Annex 6 for the Inception Workshop Report).

111. Additionally, the national consultant undertook preliminary visits on all proposed sites from the workshop to evaluate the appropriateness of the sites to the project in terms of: i) physical feasibility of adaptations interventions; ii) local interest; iii) synergies with existing interventions; iv) land degradation; v) water availability; and vi) population in the proposed sites that will benefit from the adaptation projects.
112. The demonstration sites selected based on these assessments were as follows: i) Mkhweni Inkhundla for the Umbulezi River Basin; ii) Kashewula also in the Umbulezi River Basin ; iii) Komati River Basin for the Incomati River Basin; and iv) Ngwavuma River Basin for the Maputo Basin. (See Annex 9 for the field visit report). The project intends to undertake demonstrations activities at pilot schools, clinics, Tinkhundla's centres<sup>126</sup> and Neighbourhood Care Points (NCP<sup>127</sup>) for the selected areas.

*Project conformity with SCCF adaptation portfolio*

113. The project is designed to align comprehensively to the following SCCF adaptation outcomes:
- Under Outcome 1, the project will improve vulnerability assessments in the water sector and generate information which will remove barriers related to data availability. Presently, such barriers hinder the appropriate consideration of climate risks in water resource management in the country. Outcome 1 is therefore predominantly aligned with SCCF Outcome 2.1 in the SCCF Results Based Management Framework (RBM), namely: 'Increased knowledge and understanding of climate variability and change-induced threats at country level and in targeted vulnerable areas'. Additionally, the project's Output 3.1 is aligned with Outcome 2.1 within the SCCF RBM.
  - Under Outcome 2, the project will contribute to integrating climate risk management into the implementation of key strategic national programmes as well as policies and investments plans. In so doing, the project is consistent with SCCF Outcome 1.1: 'Mainstreamed adaptation in broader development frameworks at county level and in targeted vulnerable areas'. Additionally, the project will build local community level capacities to better manage climate change risks through Outcome 2 by implementing innovative water management adaptation techniques in the demonstration sites. This is aligned with the SCCF Outcome 3.1: 'Successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas'.
  - Additionally, by undertaking the proposed climate change awareness and training activities for key government institutions, local level users and decision-makers both within the community as well as RBAs, the project is aligned with SCCF Outcome 2.2: 'Strengthened adaptive capacity to reduce risks to climate-induced economic losses' and SCCF Outcome 2.3: 'Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level'.

*National and local benefits*

114. Amongst other benefits, the project will deliver adaptation benefits in relation to water resources management that are sustainable in the face of expected climate change. Adaptation benefits will also arise through the protection of livelihoods from adverse climate change impacts on water resources. Additionally, through its activities, the project will contribute to the preservation and conservation of nationally important ecosystems. The three river basins included in the project area, for example, cover a wide variety of natural habitats, such as grasslands, bushveld with mixed tree types (broad-leafed and thorny species), evergreen forest (including riverine forest), and aquatic habitats for a wide variety of species, including those

<sup>126</sup> Tinkhundla centres are communities centers at local government level.

<sup>127</sup> NCPS are centres where orphaned and vulnerable children get at least one meal a day, informal education, life skills, medical attention and basic supplies like soap.

classified as threatened. Some species provide essential economic and social services, including those to the poor. The Incomati, for example, provides refuge to at least 40 threatened bird species, 11 threatened terrestrial mammal species, 12 threatened fish species, and eight threatened reptile and amphibian species, which are all wholly or partly dependent on water and/or riverine vegetation. In the Lower Usuthu river basin in Swaziland, 200 water-bird species were recorded. In addition, there are conservation areas of particular importance within the basins such the Kruger National Park.

115. The project will also promote rainwater harvesting technologies and techniques through which to improve rainwater infiltration rates in demonstration sites. These on-the-ground activities are likely to provide benefits such as: i) improving access to water for sanitation and drinking purposes; ii) preventing the decline of the water table, iii) reducing pumping costs; and iv) improving agricultural productivity by increasing the availability of water for irrigation purposes (with positive consequences for food security and income streams). The project's restoration and reforestation activities will increase vegetation cover over the soil, thereby resulting in an improvement in rainfall infiltration and retention as well as a reduction in soil erosion and siltation of dams and reservoirs. Furthermore, reforestation with indigenous species will provide significant biodiversity benefits. The project's restoration and reforestation activities will also provide local communities with medicinal plants, wild fruits and timber.

#### *UNDP's comparative advantage*

116. UNDP's role in Swaziland, in line with its mandate set internationally, is to support the implementation of the national poverty reduction strategy. This includes supporting the integration of the environment into development planning, and building capacity to reduce the risks of disasters. Among other comparative advantages that the UNDP has in the context of the climate change adaptation, the following stand out:
- Strong country presence: UNDP has worked and supported numerous projects on poverty reduction, disaster risk reduction, environment, energy and capacity development in Swaziland. In particular, UNDP has just completed a project in July 2010 aimed at strengthening national and local resilience to disaster risks within the context of sustainable development. In addition, UNDP is the implementing agency for the programme "Enabling Activities for the Preparation of Swaziland's Second National Communication (SNC) to the UNFCCC" and was the implementing agency for the development of Swaziland's INC in 2000. Additionally, UNDP supported the process to ensure Swaziland's compliance to the Montreal Protocol, which is the terminal phasing out of ozone depleting substances (2009-2011). UNDP was also integral in the implementation of two disaster risk reduction projects within Swaziland, supported by resources from the Bureau for the Crisis Prevention and Recovery (BCPR) and target for resource assignments from the core (TRAC). As a result of these projects, a National Disaster Risk Management Strategy was developed.
  - The provision of cross-sectoral capacity and expertise, with experience and innovation in climate risk management. As such, UNDP is able to draw on its experience in helping African governments develop adaptation projects in the water and agriculture sectors.
  - A well-established capacity to mobilise resources for development at the multi-country and national levels.
  - Access to global information networks, experience and knowledge that can be used to strengthen the implementation of the programme.
117. Overall, UNDP is well positioned to provide implementation support to the design and implementation of the adaptation measures at the community level, and on policy and institutional mainstreaming of adaptation. This is largely owing to its country presence, its coordination mandate, its established networks and its working relationships in-country.

#### **2.4. Project Objective, Outcomes and Outputs/activities**

118. The goal of the project is to ensure that the management of Swaziland's water resources is adapted to take into account the anticipated impacts of climate change. The objective of the project is to promote the implementation of national and trans-boundary IWRM that is sustainable and equitable given expected climate change.

**Outcome 1: Institutional capacity for climate change adaptation strengthened through the integration of climate change risks into national water resources management policies and the establishment of inter-sectoral-coordination mechanisms based on inclusive and informed national dialogue**

Co-financing amounts for Outcome 1: US\$ 2,745,385.

DWA (MNRE): US\$ 1,430,900

UNDP: US\$ 1,000,000

SCCF project grant requested: US\$ 314,485.

*Without SCCF intervention (baseline)*

119. Swaziland's FNC (2002) highlights that water resources particularly in international shared basins are highly vulnerable to the negative impacts from climate change. Consequently, supporting the integration of climate change risks into IWRM policy interventions and strategies is a government priority. Despite this, there is presently very little dialogue within national institutions within Swaziland dedicated to the expected impacts of climate change on water resources, mitigating these impacts and the consequences for such impacts on trans-boundary water management.
120. Whilst climate change adaptation is identified as a national priority in policies, such as the Comprehensive Agriculture Sector Policy (2007) (CASP) and the National Food Security Policy (2007) (NFSP), there has been minimal dialogue in relation to IWRM which impacts on all sectors. During policy revision processes leading to the development of both the draft National Water Policy (NWP) and the draft Integrated Water Resources Master Plan (IWRMP), climate change was one of many foci, and was consequently not awarded the focused dialogue required for appropriate climate change targeted decision-making on policy and development pathways. In addition, little dialogue has taken place in relation to integrating climate change risks into other sectoral and cross-sectoral policies, such as the draft Land Use Planning Policy.
121. In order to enable well-informed policy dialogue that results in effective decision-making, certain factors need to be in place. These include widely available information on climate change risks, informed and well-coordinated stakeholders and forums for national dialogue. At present, these factors are lacking, thereby preventing the integration of climate change risks into the water and agriculture sectors within Swaziland. For example, adaptation planning within the water sector is hindered by the fact that there is insufficient information on groundwater quality and quantity in the country, as well as insufficient monitoring of such resources. In addition, detailed information on the vulnerability of Swaziland's water sector as a whole to climate change is lacking. Whilst a preliminary vulnerability assessment has been undertaken, the findings are considered very generic<sup>128</sup>.
122. Another information deficit relates to the potential for using different crops and a more diverse array of crops under a changing climate. As a result, the vulnerability of the agriculture

<sup>128</sup> This information was obtained by the IC during a meeting with Dr Mxolisi Shongwe, Director of the NCCC, on 6 December 2010. See Annex 5 regarding stakeholder consultations.



sector to climate change impacts and adequate adaptation measures are not prioritised within national dialogues at present.

123. The NCCC is the coordinating committee informally established to ensure a coordinated approach in managing the cross-sectoral nature of climate change impacts within Swaziland. There are several shortcomings that need to be addressed in order to strengthen the committee's function<sup>129</sup>. Currently, certain key stakeholders groups are not represented by the NCCC (e.g. the private sector). In addition, the NCCC does not have specific working groups established to focus on specific topics, such as water<sup>130</sup>. Furthermore, and importantly, there are no permanent staff members dedicated to the NCCC (such as a secretariat), which means there is little continual work being undertaken for the NCCC. Additionally, the NCCC is not yet a gazetted committee, although the process to gazette the committee is underway<sup>131</sup>. The committee is thus yet to be legalised and its reporting requirements require clarification.
124. Capacity constraints within the country are one of the main factors preventing effective adaptation within the water and agriculture sectors. For example, the Swaziland Trust Commission has funding available for undertaking environmental projects, which is an opportunity for accessing funding for ecosystem-based adaptation (EBA) to improve watershed management. However, very few people or organisations are able to access this funding due to a lack of capacity on procedures to be followed to apply for the funding<sup>132</sup>. Additionally, there is limited capacity for integrating climate change risks into development planning at both local and national levels in Swaziland. In particular, much of what has been undertaken is focused on reactive emergency relief rather than on forward-looking risk reduction, preparedness and adaptation. In addition, few people within local communities understand the risks associated with following specific development pathways. Without sufficient information available upon which they can make decisions or persuade decision-makers to support their needs, local communities will remain at risk.
125. Through this outcome, the project will bolt onto the ongoing activities of: i) key government agencies MNRE (NWA, DWA), MTEA (NCCC, NMS), NDMA and MOA; ii) decentralized water institutions (RBAs, IDs, WUAs); and iii) existing non-governmental actors water forums (e.g. SZWP).

*With SCCF intervention (adaptation alternative)*

126. Through this outcome, the project will address the abovementioned barriers (see Section 1.3) that hinder adaptation action on IWRM by: i) generating new and revised information regarding projected climate change impacts on water resources; ii) strengthening national coordinating mechanisms for managing climate change and IWRM; iii) strengthening capacity to undertake climate change risk training and to integrate climate change risks into development programmes; and iv) facilitating national policy dialogue on integrating climate change risks into water resource management.
127. In addition, information critical for decision-making and policy dialogue related to climate change adaptation in the water sector will be generated, including: i) information related to the impacts of floods across sectors in Swaziland under different climate change scenarios (to understand and assess flooding risks); ii) improved vulnerability assessment of the water sector; iii) gap analysis of groundwater resources data; and iv) analysis of potential diversification measures in agriculture to improve IWRM under a changing climate. The generation of the

<sup>129</sup>Ibid.

<sup>130</sup>Ibid.

<sup>131</sup>This information was obtained by the NC during a meeting with Dr Mxolisi Shongwe, on 3 March 2011. Dr Shongwe has resigned from government, however, and will be stepping down in March 2011.

<sup>132</sup>Information obtained by the IC during a meeting with the Ngwavuma River Basin Authority, on 14 December 2010. See Annex 5 regarding stakeholder consultations.

abovementioned information will be undertaken in close collaboration with the key government agencies including: MNRE (DWA), MTEA (NMS) and MOA (SWADE). These agencies will be capacitated through this process and will provide the information which will assist in improved decision-making and policy dialogue with regards to managing climate change risks. Capacity building related to integrating climate change risks into effective water resource management will utilise Cap-Net<sup>133</sup>, which has both the materials and networks in place to support such activities.

128. In order to further reinforce the work described above, the institutional framework for inter-sectoral cooperation will be strengthened through an in-depth analysis of what institutional arrangements and procedures should be in place for effectively integrating climate change aspects into planning and management across sectors. In addition to this institutional analysis, key institutional actors will be strengthened through capacity building on mobilising both national and international sources of funding for climate change adaptation measures.
129. All of the above will contribute towards improved and informed policy dialogue on IWRM and the integration of climate change risks into IWRM. This dialogue will be facilitated through a series of workshops and working group sessions that will focus on the Integrated Water Resources Master Plan, the National Water Policy and the National Climate Change Policy).

### ***Outputs and activities***

*Output 1.1: Key scientific knowledge gaps on climate change impacts within the water sector defined, targeted research to fill knowledge gaps carried out, climate change response options identified, and main findings and strategic recommendations disseminated to at least twenty (20) relevant organisations across sectors (incl. KOBWA, MNRE, MoA, MoEPD, MoF, MoH, MoPSI, MTEA, NCCC, NDMA, NMS, NWA, RBAs, SEA, SWADE, SZWP, TPTC)*

### **Indicative activities and sub-activities:**

- 1
  - 1.1.1 Update and increase the scope/depth of the existing climate change vulnerability assessment of the water sector and its infrastructure.
    - 1.1.1.1 Undertake co-ordinated multi-sectoral research on flooding events under climate change scenarios as a component of the above vulnerability assessment.
    - 1.1.1.2 Produce and disseminate policy briefing notes summarizing main findings and recommendations.
  - 1.2
    - 1.1.2 Identify current knowledge and data gaps in groundwater resource databases and propose measures for optimising groundwater use within the IWRM framework.
    - 1.1.3 Develop national feasibility map for alternative water supply options.
    - 1.1.4 Undertake a study to show potential opportunities and constraints of crop diversification in the face of climate change in the agriculture sector in order to develop resilience.

<sup>133</sup>Capacity Building for Integrated Water Resources Management) is a UNDP initiative (<http://www.cap-net.org/>).

*Adapting national and trans-boundary water resource management in Swaziland to manage the expected impacts of climate change.*

*Output 1.2: A set of tailor-made climate change response measures related to national (and trans-boundary) water management identified and integrated into at least three (3) national level policies related to water resources management (e.g. NWP, IWRMP, draft National Climate Change Policy) through a series of national policy dialogue workshops (incl. with organisations listed under Output 1.1 and using strategic recommendations from that output)*

**Indicative activities:**

*1.2.1 Conduct series of national policy dialogue workshops with relevant actors (incl. KOBWA, MNRE, MoA, MoEPD, MoF, MoH, MoPSI, MTEA, NCCC, NDMA, NMS, NWA, RBAs, SEA, SWADE, SZWP, TPTC) to identify tailor-made climate change responses.*

*1.2.2 Facilitate integration of identified climate change responses into key national level policy documents.*

1.2

*Output 1.3: Institutional needs for inter-sectoral cooperation identified (through national dialogue - Output 1.2), appropriate national inter-sectoral coordination mechanism clearly defined, establishment/ strengthening of national coordination mechanism supported and capacity of key staff/ stakeholders strengthened through at least three (3) targeted training courses on inter-sectoral coordination*

**Indicative activities:**

1.3.1. Carry out institutional needs assessment for inter-sectoral cooperation and coordination (through national policy dialogue listed under Output 1.2)

1.3.2 Support establishment/ strengthening of inter-sectoral coordination mechanism through development and implementation of targeted capacity building and training.

1.3

**Outcome 2: Climate change risk management measures integrated into national water and agricultural programmes and implemented in pilot projects to promote adaptation on the ground.**

Co-financing amounts for Outcome 2: US\$ 3,182,315

DWA (MNRE): US\$ 2,000,000

KOBWA: US\$ 34,000

UNDP: US\$ 60,000

UNDP CO: US\$ 100,000

SCCF project grant requested: US\$ 988,315.

**Without SCCF intervention (baseline)**

130. Presently, national policies and programmes related to water and land use in Swaziland contain limited information related to climate change risk management. This is partly due to a lack of accessible information and guidelines on best practice for integrating climate change risk considerations into irrigation and water infrastructure planning. Thus their success and

effectiveness is likely to be jeopardised given predicted climate change impacts. This prevents effective adaptation at all scales.

131. In many parts of the country, inadequate water supplies are a seriously impediment to intensified and diversified agriculture. As a result, a large number of rural households are rain-fed, small-scale farmers, exposed to poverty, food insecurity and in many cases reliant on food aid. Water availability is mostly constrained by the following: i) adverse weather conditions with recurrent droughts and floods (see Section 1.1); and ii) deteriorating soil moisture contents caused by high levels of deforestation, unsustainable farming practices and overgrazing. This significantly jeopardizes the likelihood that rural communities in Swaziland will be able to overcome or adapt to the impacts climate change are expected to have on water supply and quality. Indeed, poverty limits the ability of communities to change present behaviour and adopt new approaches to overcome climate variability and climate change impacts. Many communities therefore rely solely on government interventions to improve water supply and quality as well as agricultural productivity.
132. The Government of Swaziland has made significant investments in irrigation infrastructure to encourage smallholder farmers to engage in commercial farming and increase productivity for poverty alleviation through programmes such as KDDP and LUSIP (see Section 2.3 and Annex 7 for additional information). However, information related to climate change risks and the expected consequences for water resources is not included into the training provided to rural farmers through such programmes. As a result, the success and the long-term sustainability of such programmes and indeed of agricultural productivity related to such programmes, is at risk of being threatened by predicted climate change impacts.
133. Without the implementation of adaptation measures to improve water quantity and quality under climate change conditions, the combined impacts of the lack of access to water, and depleting local water supplies due to unsustainable land management and climate change impacts will significantly increase vulnerability to climate change, particularly for rural communities depending on natural resources for their livelihoods.
134. There is high variability of micro-climates across the country and the current geographical distribution of weather stations is currently insufficient to effectively capture this variability in climate. This hinders effective weather forecasting and monitoring<sup>134</sup>. As a result, farmers and communities are unable to plan<sup>135</sup> effectively and as a result are more vulnerable to current weather anomalies. This vulnerability is likely to be exacerbated under climate change conditions, and it will become increasingly important that improved weather forecasting (both long- and short-term) is available in order to effectively adapt to changing climatic conditions.
135. Through this outcome the project will bolt onto the following (see Section 2.3 and Annex 7 for additional details):
- the two SWADE projects, LUSIP and KDDP, particularly for integrating climate change risks into the CMPs;
  - KOBWA, for climate-proofing their emergency response flood plans;
  - the LUSIP-GEF Smallholder Irrigation Project to integrate climate change risks into Chiefdom Development Plans (CDPs); and
  - ongoing activities of: i) key government agencies MNRE (NWA, DWA), MTEA (NCCC, NMS), NDMA, SEA and MOA; ii) decentralized water institutions (RBAs, IDs, WUAs); and iii) existing non-governmental actors water forums (e.g. SZWP).

<sup>134</sup> Information obtained by the IC during a meeting with the Ngwavuma River Basin Authority, on 14 December 2010. See Annex 5 regarding stakeholder consultations.

<sup>135</sup> Planning here refers to planting dates and the crop types to be planted.

***With SCCF intervention (adaptation alternative)***

136. Through this outcome, the project will facilitate the integration of climate risk management into key strategic national programmes as well as policies related to IWRM in Swaziland. This will be achieved firstly by designing guidelines and tools that provide stakeholders with the necessary information for integrating climate change risks into the National Water Policy, IWRMP, Land Use Planning Policy and specific aspects of IWRM. Secondly, the project will pilot small-scale adaptation measures in order to demonstrate practices to improve IWRM in the face of climate change and variability in the three different trans-boundary river basins within Swaziland, which will in turn catalyse policy reform. Thirdly, the project will bolt onto existing development programmes in order to integrate climate change risks into their activities.
137. A dedicated climate change policy has yet to be developed for Swaziland<sup>136</sup>. A significant amount of policy dialogue has taken place in Swaziland in order to advance the draft NWP to a point where it is about to be accepted by parliament. In addition, the IWRMP is at an advanced level and is also likely to be accepted in the near future. . Additionally, the IWRMP will be updated regularly in order to allow for adaptive management. Consequently, there is scope to propose amendments related to adaptation within the water sector based on the project's findings. The draft NLUP is an additional important policy document with regards to managing climate change in the water sector. However, there are still a significant number of political processes to be followed before this policy is formally accepted by government. There is thus also scope for the project to provide input into this policy preparation phase.
138. There are three key strategic entry points for integrating climate risk management into current and future planning and investment plans (namely KOBWA, LUSIP and KDDP, see Section 2.3 and Annex 7 for additional details). Both LUSIP and KDDP undertake Comprehensive Mitigation Plans (CMPs) with all farmers in their programmes. CMPs are effectively environmental management plans to mitigate any harmful impacts of the programme's activities on land resources. The CMPs are a suitable entry point for the integration of climate change risks into current large scale investment plans in the agricultural sector. The LUSIP-GEF Smallholder Irrigation Project provides a further entry point for integrating climate change risks into community development plans.
139. Key activities to be undertaken by the project that will contribute towards integrating climate change risks into policies, including developing best practice guidelines for improving agriculture- and water-related infrastructure as well as for integrating climate risk considerations into the rural water supply programme and other IWRM-related policies, guidelines and tools. This will facilitate the climate-proofing of key areas related to IWRM (i.e. agricultural practices, water supply, and other land use changes).
140. Further to the above, an understanding of climate change risks is required at the local and national government levels in order to improve national dialogue related to IWRM under a changing climate. In order to integrate climate change risks into planning on a local level existing training programmes that focus on emerging farmers in SWADE (LUSIP and KDDP) development programmes will be bolted onto and revised where feasible. At both a local and national level, the following bodies involved in IWRM will be trained in climate risk management: NWA, DWA, SZWP, SEA, RBAs, WUAs, IDs, the NDMA and the NMS. In addition to increasing the understanding, key technical personnel such as engineers who undertake planning for SWADE will be trained and their technical capacity on how to integrate climate change risks into their projects, and how to maximise efficiency in the technology used for irrigation under climate change improved.

<sup>136</sup> Information obtained by the IC during a meeting with Dr Mxolisi Shongwe, Director of the NCCC, on 6 December 2010. See Annex 5 regarding stakeholder consultations.

141. In order to assist vulnerable communities in Swaziland to adapt to climate change impacts on water supply and quality, as well as to capitalise on potential positive impacts emerging through climate change<sup>137</sup>, two key areas of adaptation measures will be pursued, namely: i) introducing rainwater harvesting; and ii) increasing rainwater infiltration through improved land use practices. Annex 8 contains additional information and examples of these measures. Additionally, by piloting such adaptation measures, communities will be better equipped to manage climate risks and information will be generated to assist with adaptation planning and climate risk management. Of the rainwater harvesting options, the potential for sand dams in Swaziland is currently unknown as their success is specific to geology, substrate and slopes, and thus they are only successful in specific contexts. The information as to where sand dams may be appropriate in Swaziland is currently unavailable and is therefore required in order to inform decision-making on this potential adaptation measure. Rainwater harvesting will allow water-stressed communities to capitalise on episodes of increased rainfall as a result of climate change. The second adaptation measure can be implemented through a combination of the following two approaches: i) soft landscape engineering in agricultural and/or rangeland contexts; and ii) reforestation and ecosystem restoration in watersheds, resulting in ecosystem-based adaptation (EBA). The first approach should preferably be undertaken in agricultural environments in order to showcase the success of elevated water tables through improved crop success. Elevations in water tables can also be monitored through borehole monitoring where boreholes exist.

Demonstration sites have been selected close to an existing borehole in order to facilitate monitoring of the impacts of the adaptation measures on rainwater infiltration rates. The adaptation measures to be implemented by the project will be tested at the demonstration sites to identify the measures that can be up-scaled to other sites and Tinkhundla's based on their demonstrated success and cost-effectiveness. Furthermore, the project aims to build adaptive capacity within communities through the implementation of the adaptation measures to ensure that the measures are sustainable beyond the project lifespan. In order to increase the exposure of the adaptation measures to as many stakeholders as possible, key community hubs will be selected as intervention hubs, such as schools/clinics/Tinkhundla centres/NCPs.

142. An improvement in rainwater infiltration rates will be demonstrated both directly and indirectly by the project. The project will directly improve rainwater infiltration rates by implementing techniques such as flooding, ditches and furrows (see Annex 8 for further details). Additionally, the project will indirectly contribute to improving rainwater infiltration rates within the demonstration sites by piloting EBA through reforestation and the restoration of degraded ecosystems. In so doing, rainfall infiltration rates will be improved, as will river baseflow. Furthermore, soil erosion will be reduced with a consequent reduction in river and dam sedimentation levels as well as soil conservation benefits with additional positive effects on both water supply and agricultural production. EBA will also have positive livelihood impacts through ecosystem engineering, where indigenous plant and tree species with benefits for local communities can be selected to be replanted (e.g. fodder, timber, fibre, fruit-bearing and nitrogen-fixing species). Importantly, drought-resilient trees will be selected as will those that are particularly adept at binding soils (and thus will contribute to reducing soil erosion in the event of flooding). As a result, conservation and biodiversity benefits will arise through the restoration of degraded ecosystems.

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<sup>137</sup>For example, increased episodes of heavy rainfall could be capitalised on to improve water availability.

*Adapting national and trans-boundary water resource management in Swaziland to manage the expected impacts of climate change.*

*Output 2.1: Guidelines for mainstreaming climate change risks into key national policies (NWP, IWRMP, NCCP) developed, toolkits on practical application of climate change response measures (identified through Output 1.2) developed and at least five (5) targeted training courses on toolkit application delivered*

**Indicative activities and sub-activities:**

- 2.1.1. Develop guidelines for mainstreaming climate change risks into key national policies and plans
- 2.1.2. Develop toolkits for practical implementation of climate change response measures.
- 2.1.3. Develop and deliver targeted training courses based on developed toolkits.

*Output 2.2: Programme/ project specific climate change risks and tailor-made response measures identified and integrated into at least three (3) major management/ investment plans implemented in Swaziland (incl. KDDP, LUSIP and CDPs developed under the GEF SLM programme implemented by SWADE)*

**Indicative activities:**

- 1.1
- 2.2.1. Review and climate-proof the KOBWA emergency response flood plans where necessary based on research undertaken in Activity 1.1.1.
- 2.2.2. Integrate climate change risks into KDDP and LUSIP Phase I and Phase II CMPs.
- 2.2.3. Integrate climate change risks and IWRM principles into the CDPs being developed in 15 chiefdoms under the GEF SLM programme.

*Output 2.3: Capacity of key stakeholders and water resources management and/or agricultural development practitioners to integrate climate change risks into their activities strengthened by incorporating the climate risks/responses measures (identified under Output 2.2) into the ongoing training courses offered as part of ongoing national programmes (e.g. KDDP, LUSIP).*

**Indicative activities:**

- 1.4
- 2.3.1. Develop climate change adaptation modules for (existing) SWADE train-the-trainers courses train trainers in SWADE (LUSIP and KDDP) to improve their technical capacity on the impacts of climate change on water and agriculture and to contextualise this in their extension work with farmers<sup>138</sup>.
- 2.3.2. Integrate climate change risks into all LUSIP and KDDP training modules. These include: i) water management; ii) sugar cane productions; iii) environmental policy; iv) agri-business; and v) employment regulation.
- 2.3.3. Train community environmental officers who have been appointed for each farmers' association in KDDP and LUSIP on climate change impacts, and the relationship between such impacts and different baseline land use practices.

<sup>138</sup> Training will also involve information concerning adaptation measures applicable to the water and agriculture sectors. Training will be targeted towards the Planning and Institutions Development Unit (PIDU) as well as all units that undertake training or extension work with communities and farmers. The PIDU interacts with the traditional leaders, thus providing a key entry point to mainstreaming climate change into local decision-making.

- 2.3.4. Undertake climate change risk training based on a capacity needs assessment in order to integrate climate change risks into decision-making within NCCC, SEA, NWA, DWA, SZWP, RBAs, WUAs, IDs, NDMA, and NMS.
- 2.3.5. Undertake workshops with the technical staff and engineers of SWADE to assist them in increasing their capacity to include climate change considerations in their development plans.
- 2.3.6. Train water user associations and RBAs and the NMS to: i) manage weather stations installed in the demonstration sites (see Activity 2.4.7) to improve the long-term monitoring of climate change in Swaziland; ii) collect data; and iii) transfer data to the NMS office and ensure the appropriate storage of the data.

*Output 2.4: Community based climate resilience projects implemented in pilot sites, including the installation of rainwater harvesting systems in at least four (4) identified communities/ areas and rainwater infiltration improvement schemes (incl. reforestation) in at least four (4) communities/areas*

**Indicative activities:**

- 2.4.1. Install rainwater harvesting systems to provide water for domestic use and/or vegetable gardens at the following sites:
  - i. Komati River Basin at pilot schools enrolled in the KOBWA programme (building on from KOWBA modules);
  - ii. Mkhiweni Inkhudla (Kutsimuleni, Dvokolako and Mbelebeleni) in the Umbulezi River Basin at pilot schools/clinics/Tinkhundla's/NCPs;
  - iii. Kashewula community in the Umbulezi River Basin at pilot schools/clinics/Tinkhundla's/NCPs;
  - iv. Ngwavuma River Basin in the Maputo Basin at pilot schools/clinics/Tinkhundla's/NCPs.
- 2.4.2. Determine feasible sites for the installation of sand dams.

**Indicative activities:**

- 2.4.3. Demonstrate appropriate techniques to directly improve rainwater infiltration rates in vulnerable communities at the following sites:
  - i. Komati River Basin at pilot schools enrolled in the KOBWA programme (building on from KOWBA modules);
  - ii. Mkhiweni Inkhudla (Kutsimuleni, Dvokolako and Mbelebeleni) at pilot schools/clinics/Tinkhundla's/NCPs;
  - iii. Kashewula community at pilot schools/clinics/Tinkhundla's/NCPs;
  - iv. Ngwavuma River Basin at pilot schools/clinics/Tinkhundla's/NCPs.
- 2.4.4. Train stakeholders from Mkhiweni Inkhudla on reforestation techniques, including: i) basic horticultural practices; ii) nursery maintenance; iii) transfer of saplings to sites; iv) alien clearing best practices; and v) appropriate practices for establishing the saplings in the degraded ecosystem.
- 2.4.5. Undertake reforestation and ecosystem restoration in Mkhiweni Inkhudla.
- 2.4.6. Install basic weather stations (i.e. to collect rainfall, wind, temperature) at the demonstration sites as well as at LUSIP (Phase 1) and KDDP sites (if not included in the above pilot).
- 2.4.7. Develop water resource management and climate change high school modules with KOBWA for schools in the Komati River Basin. This will include a module on how to enhance rainwater infiltration.
- 2.4.8. Train community members to build simple rainwater harvesting systems and raise awareness of the benefits associated with rainwater harvesting.



- 2.4.9. Train community members on techniques to enhance rainwater infiltration and raise awareness of the benefits associated with enhancing rainwater infiltration.
- 2.4.10. Produce a lessons learned document on both rainwater harvesting and rainwater infiltration pilots and present findings to NCCC, the NWA, DWA, SZWP, RBAs, WUAs, IDs, the NDMA, the NMS and donor agencies to motivate for up-scaling where successful.
- 2.4.11. Document lessons-learned from the project on a continual basis and compile the results of adaptation measures under Outcomes 2. Present the lessons in a summary document that is distributed to all stakeholders. In addition, collate and submit all technical reports and documents on lessons-learned to the ALM and WikiADAPT.

**Outcome 3: Negotiations on trans-boundary water management for the Incomati, Maputo and Umbeluzi river basins informed by climate change risk analysis.**

Co-financing amounts for Outcome 3: US\$ 800,200

DWA (MNRE): US\$ 600,000

SCCF project grant requested: US\$ 200,200.

***Without SCCF intervention (baseline)***

143. All of Swaziland's water resources are shared with neighbouring countries (Mozambique and South Africa). The allocation of the shared water resources between the basin states is regulated through a number of international agreements. Trans-boundary water management on the Incomati and Maputo Rivers is governed by the Interim Inco Maputo Agreement (IIMA) of 2002. This agreement is scheduled for revision and the process for negotiating the future Comprehensive Agreement(s) has been triggered in the second half of 2010 and formal negotiations/ drafting of the agreement(s) are expected to start in 2012. Similarly, negotiations between Swaziland and Mozambique on management and use of the Umbeluzi water resources are currently ongoing.
144. Largely due to a lack of information on the long-term impacts of climate change on the water resources of Swaziland's shared basins as well as due to limited awareness, climate change considerations do not feature high (if at all) in the agreement negotiations. There is therefore a risk that climate change impacts on the shared water resources are under- (or over-) estimated leading to an inadequate allocation and management regime at trans-boundary level with possible long-term implications on development.

***With SCCF intervention (adaptation alternative)***

145. Through this outcome, the project will ensure that Swaziland develops a coherent short-, mid-, and long-term position on trans-boundary water resources that adequately integrates climate change aspects based on the scientific information and analysis carried out under Outcomes 1 and 2. An informed and technically sound position will enable the Swaziland delegation to the trans-boundary negotiation(s) introduce climate change aspects into the negotiation process. This in turn improves the likelihood of developing and integrating appropriate adaptive (legal, regulatory and technical) mechanism into the agreements that will govern the management of the three basins in the future and thereby improving the long-term management of the basins. It should be noted that the activities within this outcome will be focused on Swaziland's delegation to the Joint Water Commission (JWC) and Tripartite Permanent Technical Committee (TPTC) and not on South Africa's and Mozambique's delegations as this is outside the scope of this project.
146. In parallel to the development of the above, the project will through this outcome develop targeted information and awareness raising material for relevant (to trans-boundary negotiations) Swaziland decision-makers across relevant sectors as well as for the main stakeholder (user)

groups impacted by the trans-boundary water allocation and management regime. This will assist the stakeholders to consider possible changes to the trans-boundary water allocation regime (and the resulting changes at national level) into their long-term management planning and thus contribute to improving their adaptive capacity with respect to climate change impacts.

### **Outputs and activities**

*Output 3.1: Climate change impacts on trans-boundary water resource management (TBWRM) and negotiation options assessed, tailor-made (short-, mid- and long-term) TBWRM strategy paper for Swaziland developed through consultations with key stakeholders (as integral part of national policy dialogue - Output 1.2) and position paper for Swaziland TBWRM negotiation team(s) jointly developed (with negotiators)*

#### **Indicative Activities:**

- 3.1.1. Undertake targeted assessment of climate change impacts on trans-boundary water management based on vulnerability assessment carried out under Output 1.1.
- 3.1.2. Develop strategy paper mapping out short-, mid-, and long-term objectives of Swaziland with respect to trans-boundary water management in the light of changing climatic conditions.
- 3.1.3. Develop a position paper informing Swaziland delegations to Incomati/Maputo and Umbeluzi negotiations (respectively) on options for integrating climate change aspects into agreement negotiations including possible adaptive management tools for integration into the forthcoming agreements.

*Output 3.2: Targeted information briefs on projected climate change impacts on TBWRM developed and disseminated to senior decision-makers in at least twenty (20) relevant organisations, including key water user groups*

#### **Indicative Activities:**

- 3.2.1. Develop targeted information briefs on projected climate change impacts on trans-boundary water resources management for relevant decision-makers at technical and political level across all relevant sectors.
- 3.2.2. Develop awareness raising material for relevant stakeholder (user) groups on short-, mid- and long-term impacts of climate change on trans-boundary water management and allocation regime.

### **2.5. Key indicators, risks and assumptions**

147. The project indicators will rely largely on Vulnerability Reduction Assessments<sup>139</sup> (VRA), which is an important element of UNDP's "Monitoring and Evaluation Framework for Climate Change Adaptation". This has been implemented in a growing number of GEF initiatives under UNDP's Community Based Adaptation (CBA) Programme. The VRA is a perception-based approach, to complement quantitative indicators that measure project results. The VRA directly asks communities if CBA activities are correctly targeted in reducing vulnerability. Additionally, project progress will be monitored using the Adaptation Monitoring and Assessment Tool (AMAT), which will be conducted three times during the project's lifetime<sup>140</sup>. The project

<sup>139</sup> Droesch, A.C. Gaseb, N. Kurukulasuriya, P. Mershon, A. Moussa, K.M. Rankine, D. and Santos, A. 2008. A guide to the Vulnerability Reduction Assessment. United Nations Development Programme Community-Based Adaptation Programme.

<sup>140</sup> Further details are available at [http://www.thegef.org/gef/tracking\\_tool\\_LDCF\\_SCCF](http://www.thegef.org/gef/tracking_tool_LDCF_SCCF).

indicators are impact and performance indicators as described in the UNDP's "Monitoring and Evaluation Framework for Climate Change Adaptation".

The Project Results Framework in Section 3 details indicators, baseline, targets and sources of verification at the Outcome level.

148. At the level of the three outcomes, the indicators are as follows:

**Outcome 1: Institutional capacity for climate change adaptation strengthened through the integration of climate change risks into national water resources management policies and the establishment of inter-sectoral coordination mechanisms based on inclusive and informed national dialogue**

**Indicators:**

1.1: Key scientific knowledge gaps on climate change impacts within the water sector defined, targeted research to fill knowledge gaps carried out, climate change response options identified, and main findings and strategic recommendations disseminated to at least twenty (20) relevant organisations across sectors (incl. KOBWA, MNRE, MoA, MoEPD, MoF, MoH, MoPSI, MTEA, NCCC, NDMA, NMS, NWA, RBAs, SEA, SWADE, SZWP, TPTC)

1.2: A set of tailor-made climate change response measures related to national (and trans-boundary) water management identified and integrated into at least three (3) national level policies related to water resources management (e.g. NWP, IWRMP, draft National Climate Change Policy) through a series of national policy dialogue workshops (incl. with organisations listed under Output 1.1 and using strategic recommendations from that output)

1.3: Institutional needs for inter-sectoral cooperation identified (through national dialogue - Output 1.2), appropriate national inter-sectoral coordination mechanism clearly defined, establishment/strengthening of national coordination mechanism supported and capacity of key staff/ stakeholders strengthened through at least three (3) targeted training courses on inter-sectoral coordination

**Outcome 2: Climate change risk management measures integrated into national water and agricultural programmes and implemented in pilot projects to promote adaptation on the ground**

**Indicators:**

2.1: Guidelines for mainstreaming climate change risks into key national policies (NWP, IWRMP, NCCP) developed, toolkits on practical application of climate change response measures (identified through Output 1.2) developed and at least five (5) targeted training courses on toolkit application delivered

2.2: Programme/ project specific climate change risks and tailor-made response measures identified and integrated into at least three (3) major management/ investment plans implemented in Swaziland (incl. KDDP, LUSIP and CDPs developed under the GEF SLM programme implemented by SWADE)

2.3: Capacity of key stakeholders and water resources management and/or agricultural development practitioners to integrate climate change risks into their activities strengthened by incorporating the climate risks/responses measures (identified under Output 2.2) into the ongoing training courses offered as part of ongoing national programmes (e.g. KDDP, LUSIP).

2.4: Community based climate resilience projects implemented in pilot sites, including the installation of rainwater harvesting systems in at least four (4) identified communities/ areas and rainwater infiltration improvement schemes (incl. reforestation) in at least four (4) communities/areas.

**Outcome 3: Negotiations on trans-boundary water management for the Incomati, Maputo and Umbeluzi river basins informed by climate change risk analysis.**

**Indicators:**

3.1: Climate change impacts on trans-boundary water resource management (TWRM) and negotiation options assessed, tailor-made (short-, mid- and long-term) TWRM strategy paper for Swaziland developed through consultations with key stakeholders (as integral part of national policy dialogue - Output 1.2) and position paper for Swaziland TWRM negotiation team(s) jointly developed (with negotiators).

3.2: Targeted information briefs on projected climate change impacts on TWRM developed and disseminated to senior decision-makers in at least twenty (20) relevant organisations, including key water user groups.

149. Key assumptions underlying the project design include:

- Stakeholders such as key government agencies including: MNRE (DWA, NWA), MTEA (NCCC, METS) and MOA (SWADE), NDMA and decentralized water institutions including SZWP, RBAs, IDs, and WUAs remain committed to implementing baseline activities complemented by the additionality interventions the project aims to implement.
- Demonstration sites are best placed to demonstrate the benefits of measures to adapt to climate change.
- The major implementing agents at the community level (extension workers and community workers) remain committed to the project during the project lifetime.
- Climate change concerns are not overshadowed by other emergency matters or urgent projects.
- Government commits itself to incorporate climate change adaptation into its policy documents as a matter of priority.
- Information on water sector vulnerability assessments and adaptation options is available.
- Targeted institutions are willing to participate in training.

150. Risks and countermeasures are tabulated in the Risk log matrix included in Annex 1.

**2.6. Cost-effectiveness**

151. The project will, among other things, inform and modify baseline investments amounting to more than US\$250 million in irrigation expansion and integrated water resource management within Swaziland (i.e. the KDDP and the LUSIP). The success of these projects is likely to be hindered by anticipated climate change impacts due to the fact that climate change considerations are presently not integrated in these projects. The economic impact of the project's activities related to these baseline projects is, therefore, potentially much higher than its initial investment and thus very likely to be cost-effective.

152. Cost information was determined for the small-scale, on-the-ground adaptation measures identified as a result of the consultations undertaken during the PPG Phase and, based on this, the activities were deemed cost-effective. Where actual techniques are to be identified by community members and stakeholders in the inception phase (following research into various techniques), cost-effectiveness will be a key factor taken into consideration. In addition, the effectiveness of

these activities in increasing resilience to climate change will be tested and measured during the course of the project. This will be achieved through an economic analysis and cost-benefit analyses to ascertain whether each activity is an economically viable option given climate change conditions. The most successful activities will be prioritised for up-scaling to neighbouring communities and details regarding their implementation will be disseminated widely at the workshops/training events undertaken by the project.

153. The adaptation measures to be piloted by the project, particularly the reforestation and restoration activities (see paragraph 92), will have multiple benefits for a wide-range of beneficiaries. Measures such as the introduction of rainwater harvesting techniques will allow communities to capitalise on episodes of increased rainfall as a result of climate change using relatively low-cost equipment. Additionally, utilising improved land use practices to showcase enhanced rainwater infiltration rates will improve the adaptive capacity of community members. Such measures are also relatively inexpensive and are likely to be readily adopted by community members, which will catalyse adaptation in areas neighbouring the project's demonstration areas.

## **2.7. Sustainability**

154. The sustainability of the project's benefits will depend on the willingness of stakeholders to adopt interventions and continue with them beyond the duration of the project lifetime, and the long-term political and financial commitment of policy-makers to provide enabling investment environments for scaling up of successful adaptation measures. Adequate technical, legal and institutional capacity and expertise (all part of adaptive capacity) is required at the national and local levels for sustainability. As such, the project will strengthen adaptive capacity at all levels by *inter alia*:
- improving the generation of information critical for decision-making and policy dialogue related to climate change adaptation in the water sector;
  - strengthening institutional coordination of all relevant stakeholders involved in IWRM in Swaziland;
  - improving knowledge related to the opportunities and constraints of crop diversification given climate change;
  - facilitating an assessment to strengthen the coordinating function of the national climate change coordinating body, the NCCC;
  - improving knowledge and skills related to mobilising national and international funding for adaptation;
  - building awareness and a greater understanding of climate change risks and adaptation benefits at all levels (i.e. from community members at the local level to policy-makers at national level);
  - raising awareness within communities of the benefits associated with increasing rainwater infiltration, rainwater harvesting, and reforestation;
  - improving the technical capacity of trainers in SWADE to integrate climate change considerations into their extension services; and
  - developing the evidence base to make the case for greater levels of investments in adaptation.
155. To further strengthen within-country capacity to facilitate the development and adoption of effective adaptation measures across Swaziland, the project will place emphasis on employing and capacitating national consultants to assist with project interventions where possible, with international consultants being employed only where the necessary capacity is lacking in Swaziland. National consultants will work closely with international consultants in order to encourage knowledge sharing and improve the capacity of the national consultants. This, too, will contribute to the sustainability of project interventions. Overall, people in Swaziland (including the consultants, government staff and local communities) will be capacitated through the project's implementation, which will also improve the sustainability of the project beyond the project lifetime.

156. In addition, sustainability will also be improved through the facilitation of the integration of climate risk management into key strategic regional, national and local programmes as well as policies related to IWRM in Swaziland. This is likely to provide an enabling environment that will catalyse adaptation action. Overall, the project's activities will improve awareness regarding climate change impacts, particularly in the water sector, and effective means to adapt to such impacts. In so doing, the project will make the case for the project's adaptation measures to stakeholders at all levels and thereby ensure their sustainability after the project lifetime.
157. Furthermore, the project will build upon current projects in Swaziland (see Section 2.3). In this way, the project will follow successful methods and avoid pitfalls experienced by previous projects. Additionally, the project will benefit from the strong network and relations established by SWADE with local communities through the KDDP and LUSIP projects, which will also ensure that the project's adaptation measures are successful and that tangible benefits arise through their implementation. Such activities will remain successful beyond the project lifetime and may potentially be up-scaled to neighbouring communities/Tinkhundlas. Importantly, the project was developed in close collaboration with government, community leaders as well as with community members and national-level stakeholders, in order to ensure ownership of the project's activities. This too will contribute to ensuring the sustainability of the project's activities.

## **2.8. Replicability**

158. The project is being implemented in selected communities representing the three international rivers basins within Swaziland. There is thus considerable potential for widespread replication of the interventions at a larger basin scale. Local-level stakeholders will be capacitated and involved in implementing the project's activities thereby ensuring that the project delivers tangible benefits. This will improve the likelihood of replication of such activities in additional sites as stakeholders will be capacitated with the skills to replicate activities and will be exposed to the benefits associated with successful activities. The project will generate important documentation of studies and analyses which will be widely disseminated through workshops and existing knowledge networks. Importantly, the project will ensure that project lessons emerging from key project activities, such as rainwater harvesting, rainwater infiltration and reforestation are documented. Furthermore, best practices and documentation from the project will be disseminated globally via the UNDP's Adaptation Learning Mechanism (ALM) and wikiADAPT.
159. The close involvement of key government institutions and all relevant stakeholders in water resource management in the project's development and implementation promises potential for future incorporation of the project's approaches into ongoing government planning and strategies. Additionally, it is expected that the strengthening of capacities among key government stakeholders will enable continued mainstreaming of climate considerations into water resources management planning and decision-making.
160. Furthermore, the extensive training and capacity building of local communities and technical staff regarding adaptation measures and effective climate risk management will contribute to climate-proofing future endeavours related to water. In so doing, project interventions will be ensured into the future and are more likely to be replicated and/or up-scaled. The adaptation measures that promote EBA will by design contribute to better basin management and have the potential to be replicated elsewhere in the country (or beyond) where more decentralised approaches to basin management is promoted through IWRM implementation. This, too, will contribute to ensuring the sustainability and replicability of the project's activities beyond the project's lifetime.

*Adapting national and trans-boundary water resource management in Swaziland to manage the expected impacts of climate change.*

**3. Project Results Framework**

**This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: CPAP (2011-2015) Outcome 3: National institutions have the capacity and provide guidance on the utilisation of natural resources in a sustainable and equitable manner.**  
**Country Programme Outcome Indicators:**  
 Enhanced national capacity to put in place environmentally friendly and sustainable development.  
**Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one):**  
**1. Mainstreaming environment and energy OR 2. Catalyzing environmental finance OR 3. Promote climate change adaptation OR 4. Expanding access to environmental and energy services for the poor.**  
**Applicable GEF Strategic Objective and Programme:**  
 CCA-1: Reducing Vulnerability; CCA-2: Increasing Adaptive Capacity; and CCA-3: Adaptation Technology Transfer<sup>141</sup>  
**Applicable SCCF Expected Outcomes:**  
 Outcomes 1.1, 2.1, 2.2, 2.3 and 3.1.  
**Applicable GEF Outcome Indicators:** Indicators 1.1.1, 2.1.1, 2.2.1, 2.3.1, and 3.1.1.  
**Project Objective:** Promote the implementation of national and trans-boundary integrated water resource management that is sustainable and equitable given expected climate change.

Outcome	Indicator	Baseline	Targets End of Project	Source of verification	Risks and Assumptions
<b>Outcome 1:</b> Institutional capacity for climate change adaptation strengthened through the integration of climate change risks into national water resources management policies and the establishment of inter-sectoral coordination mechanisms based on inclusive and informed national dialogue	<b>1.1: Key scientific knowledge gaps on climate change impacts within the water sector defined, targeted research to fill knowledge gaps carried out, climate change response options identified, and main findings and strategic recommendations disseminated to at least twenty (20) relevant organisations across sectors (incl. KOBWA, MNRE, MoA, MoEPD, MoF, MoH, MoPSI, MTEA, NCCC, NDMA, NMS, NWA, RBAs, SEA, SWADE, SZWP, TPTC)</b>	<b>1.1</b> Information in Swaziland on climate change risks and possible impacts is scarce, particularly regarding flood vulnerability, groundwater potential and crop diversification options	<b>1.1:</b> Key scientific knowledge gaps on climate change impacts within the water sector defined, targeted research to fill knowledge gaps carried out, climate change response options identified, and main findings and strategic recommendations disseminated to at least twenty (20) relevant organisations across sectors (incl. KOBWA, MNRE, MoA, MoEPD, MoF, MoH, MoPSI, MTEA, NCCC, NDMA, NMS, NWA, RBAs, SEA, SWADE, SZWP, TPTC)	<b>1.1.1</b> Flood vulnerability assessment report  <b>1.1.2</b> Report on assessment of groundwater potential and optimising groundwater use in the IWRM framework  <b>1.1.3</b> National feasibility map for alternative water supply options, e.g. rainwater harvesting, sand dam construction  <b>1.1.4</b> Assessment	<b>Risk:</b> Difficulty in accessing existing baseline data from government departments

<sup>141</sup>This is from the SCCF RBM Framework.



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	<p><b>1.2:</b> A set of tailor-made climate change response measures related to national (and trans-boundary) water management identified and integrated into at least three (3) national level policies related to water resources management (e.g. NWP, IWRMP, draft National Climate Change Policy) through a series of national policy dialogue workshops (incl. with organisations listed under Output 1.1 and using strategic recommendations from that output)</p>	<p><b>1.2:</b> A set of tailor-made climate change response measures related to national (and trans-boundary) water management identified and integrated into at least three (3) national level policies related to water resources management (e.g. NWP, IWRMP, draft National Climate Change Policy) through a series of national policy dialogue workshops (incl. with organisations listed under Output 1.1 and using strategic recommendations from that output)</p>	<p><b>1.2.1</b> Revised/ updated policy documents with specific sections on climate change adaptation</p> <p><b>1.2.2</b> Policy dialogue workshop reports &amp; attendance lists</p>	<p><b>Assumption:</b> Government remains committed to incorporating climate change adaptation into its policy documents as a matter of priority</p> <p><b>Risk:</b> Policy adoption process gets obstructed by external (political) factors</p>
	<p><b>1.3:</b> Institutional needs for inter-sectoral cooperation identified (through national dialogue – Output 1.2), appropriate national inter-sectoral coordination mechanism clearly defined, establishment/ strengthening of national coordination mechanism supported and capacity of key staff/ stakeholders strengthened through at least three (3) targeted training courses on inter-sectoral coordination</p>	<p><b>1.3:</b> Institutional needs for inter-sectoral cooperation identified (through national dialogue – Output 1.2), appropriate national inter-sectoral coordination mechanism clearly defined, establishment/ strengthening of national coordination mechanism supported and capacity of key staff/ stakeholders strengthened through at least three (3) targeted training courses on inter-sectoral coordination</p>	<p><b>1.3.1</b> Policy dialogue workshop reports &amp; attendance lists</p> <p><b>1.3.2</b> Institutional needs assessment report with recommendations for institutional strengthening</p> <p><b>1.3.3</b> Government Gazette with formal inter-sectoral coordination mechanisms, minutes of committee meetings</p>	<p><b>Risk:</b> Lack of government commitment to formalised inter-sectoral coordination mechanism. Divergent sector stakeholder interests undermine effective inter-sectoral coordination</p>



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<p><b>Outcome 2:</b> Climate change risk management measures integrated into national water and agricultural programmes and implemented in pilot projects to promote adaptation on the ground</p>	<p><b>2.1:</b> Guidelines for mainstreaming climate change risks into key national policies (NWP, IWRMP, NCCP) developed, toolkits on practical application of climate change response measures (identified through Output 1.2) developed and at least five (5) targeted training courses on application delivered</p>	<p><b>2.1:</b> Key national policies do not, or consider climate change and inadequate knowledge on practical implementation of climate change response measures</p>	<p><b>2.1:</b> Guidelines for mainstreaming climate change risks into key national policies (NWP, IWRMP, NCCP) developed, toolkits on practical application of climate change response measures (identified through Output 1.2) developed and at least five (5) targeted training courses on toolkit application delivered</p>	<p><b>1.3.4</b> Training course reports, attendance lists and completed evaluation forms</p> <p><b>2.1.1</b> Guideline and toolkit documents</p> <p><b>2.1.2</b> Training course reports, attendance lists and completed evaluation forms</p>	<p><b>Risk: (Some) relevant stakeholders do not view climate change as a priority issue</b></p>
<p><b>2.2:</b> Capacity of key stakeholders and water resources management and/or agricultural development practitioners to integrate climate change risks into their activities strengthened by incorporating the climate risks/responses measures (identified under Output 2.2) into the ongoing training courses offered as part of</p>	<p><b>2.2:</b> Programme/project specific climate change risks and tailor-made response measures identified and integrated into at least three (3) major management/ investment plans implemented in Swaziland (incl. KDDP, LUSIP and CDPs developed under the GEF SLM programme implemented by SWADE)</p>	<p><b>2.2</b> Climate change risks and possible response measures at present not considered in national management/ investment plans</p>	<p><b>2.2:</b> Programme/project specific climate change risks and tailor-made response measures identified and integrated into at least three (3) major management/ investment plans implemented in Swaziland (incl. KDDP, LUSIP and CDPs developed under the GEF SLM programme implemented by SWADE)</p>	<p><b>2.2.1</b> Programme specific climate change risk assessment/ response options reports</p> <p><b>2.2.2</b> Revised management/ investment plans</p>	<p><b>Risk: (Some) relevant stakeholders do not view climate change as a priority issue</b></p>
<p><b>2.3:</b> Capacity of key stakeholders and water resources management and/or agricultural development practitioners to integrate climate change risks into their activities strengthened by incorporating the climate risks/responses measures (identified under Output 2.2) into the ongoing training courses offered as part of</p>	<p><b>2.3:</b> i) Climate change adaptation modules developed for train-the-trainers courses based on risks/responses identified under Output 2.2 to raise trainers awareness and capacity on CCA, ii) at least two forthcoming training courses are strengthened through the inclusion of CCA modules in the training materials, and iii)</p>	<p><b>2.3</b> Knowledge and awareness of climate change risks is very low and climate change risk is not adequately considered in ongoing implementation of ongoing activities</p>	<p><b>2.3:</b> i) Climate change adaptation modules developed for train-the-trainers courses based on risks/responses identified under Output 2.2 to raise trainers awareness and capacity on CCA, ii) at least two forthcoming training courses are strengthened through the inclusion of CCA modules in the training materials, and iii)</p>	<p><b>2.3.1</b> Climate change adaptation modules for ToT courses</p> <p><b>2.3.2</b> Training course reports, attendance lists and completed evaluation forms</p>	<p><b>Assumption: Relevant stakeholders are willing to participate in training Risk: (Some) relevant stakeholders do not view climate change as a priority issue</b></p>

	<p>ongoing national programmes (e.g. KDDP, LUSIP).</p> <p><b>2.4:</b> Community based climate resilience projects implemented in pilot sites, including the installation of rainwater harvesting systems in at least four (4) identified communities/ areas and rainwater infiltration improvement schemes (incl. reforestation) in at least four (4) communities/areas</p>	<p><b>2.4</b> Climate change risk awareness and adaptation capacity at community level is very low</p>	<p>strengthened training courses offered to build awareness and capacity of practitioners</p> <p><b>2.4:</b> Rainwater harvesting systems installed and rainwater infiltration measures (reforestation etc.) applied at the following four sites: i. Komati River Basin at pilot schools enrolled in the KOBWA programme ii. Mkiweni Inkhudla in the Umbulezi River Basin at pilot schools/clinics/Tinkhundla s/N CPs; iii. Kashewula community in the Umbulezi River Basin at pilot schools/clinics/Tinkhundla s/N CPs; iv. Ngwavuma River Basin in the Maputo Basin at pilot schools/clinics/Tinkhundla s/N CPs.</p>	<p><b>2.4</b> Site visits to pilot sites in Komati Basin, Mkiweni, Kashewula and Ngwavuma</p>	<p><b>Assumption:</b> Selected communities are committed to participating in the pilot projects as decalred during the PPC field visits</p> <p><b>Risk:</b> Competing activities for land use could cause disagreement in relation to implementation of adaptation measures; project installation (rainwater harvesting tanks, planted trees etc.) affected by vandalism, theft</p>
<p><b>Outcome 3:</b> Negotiations on trans-boundary water management for the Incomati, Maputo and Umbeluzi river basins informed by climate change risk analysis.</p>	<p><b>3.1:</b> Climate change impacts on trans-boundary water resource management (TWRM) and negotiation options assessed, tailor-made (short-, mid- and long-term) TWRM strategy paper for Swaziland developed through consultations with key stakeholders (as integral part of national policy dialogue - Output 1.2); and position paper for Swaziland TWRM negotiation team(s) jointly developed (with negotiators)</p>	<p><b>3.1</b> Present water agreements (on Incomati, Maputo) do not adequately address climate change and adaptation</p>	<p><b>3.1:</b> Climate change impacts on trans-boundary water resource management (TWRM) and negotiation options assessed, tailor-made (short-, mid- and long-term) TWRM strategy paper for Swaziland developed through consultations with key stakeholders (as integral part of national policy dialogue - Output 1.2); and position paper for Swaziland TWRM negotiation team(s) jointly developed (with negotiators)</p>	<p><b>3.1.1</b> TWRM strategy for Swaziland with explicit consideration of climate change risks/ impacts</p> <p><b>3.1.2</b> Negotiation position paper for Swaziland</p>	<p><b>Assumption:</b> Other riparian countries accept consideration of climate change risks/impacts as negotiation subject (it has been identified as priority at Tripartite (TPTC) level)</p>



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**4. Total Budget and Workplan**

Award ID:	00061373	Project ID(s):	00077723											
Award Title:	Adapting national and trans-boundary water resource management in Swaziland to manage the expected impacts of climate change													
Business Unit:	SWZ10													
Project Title:	Adapting national and trans-boundary water resource management in Swaziland to manage the expected impacts of climate change													
PIMS no.	3603													
Implementing Partner (Executing Agency)	Department of Water Affairs, Ministry of Natural Resources and Energy													
SOF (e.g. GEF) Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)	See Budget Note:			
<b>OUTCOME 1:</b> Institutional capacity for climate change adaptation strengthened through the integration of climate change risks into national water resources management policies and the establishment of inter-sectoral-coordination mechanisms based on inclusive and informed national dialogue	DWA	62180	GEF (SCCF)	71300	Local consultants	23 193	9 413	5 622	5 522	43 750	a			
				71400	Contractual Services - Individ.	9 500	9 500	9 500	9 500	38 000	b			
				74500	Miscellaneous	100	100	50	50	300	c			
				74200	Audio-visual & printing products	1 000	1 110	1 110	750	3 970	d			
				75700	Workshops & Training	4 552	7 052	5 297	3 199	20 100	e			
				71200	International consultants	68 796	52 416	18 018	24 570	163 800	f			
				71600	Travel	17 100	15 449	7 500	4 516	44 565	g			
								<b>GEF Subtotal OUTCOME 1</b>	<b>124 241</b>	<b>95 040</b>	<b>47 097</b>	<b>48 107</b>	<b>314 485</b>	

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<p><b>OUTCOME 2:</b> Climate change risk management measures integrated into national water and agricultural programmes and pilot projects to promote adaptation on the ground</p>	DWA	62180	GEF (SCCF)	71300	Local consultants	69 402	76 693	27 545	4 860	178 500	h
				71400	Contractual Services - Individ.	10 314.5	10 314.5	10 314.5	10 314.5	41 258	i
				72200	Equipment	142 343	82 172	13 306	2 179	240 000	j
				72300	Materials & Goods	35 657	17 828	5 694	5 321	64 500	k
				74500	Miscellaneous	100	50	50	50	250	l
				75700	Workshops & Training	22 748	18 525	8 723	2 454	52 450	m
				74200	Audio-visual & printing products	9 203	6 275	2 677	1 045	19 200	n
				72100	Contractual Services Companies	9 500	11 500	9 800	7 200	38 000	o
				71200	International consultants	85 043	105 062	75 271	20 224	285 600	P
				71600	Travel	21 827	23 500	16 230	7 000	68 557	q
								<b>GEF Subtotal</b>	<b>406 137.5</b>	<b>351 919.5</b>	<b>169 610.5</b>
<p><b>OUTCOME 3:</b> NEGOTIATIONS ON TRANS-BOUNDARY WATER MANAGEMENT FOR THE INCOMATI, MAPUTO AND UMBELUZI RIVER BASINS INFORMED BY CLIMATE</p>	DWA	62180	GEF (SCCF)	71300	Local consultants	10 000	10 000	10 000	10 000	40 000	r
				71400	Contractual Services - Individ.	8 000	8 000	8 000	8 000	32 000	s
				74500	Miscellaneous	50	50	50	50	200	t
				75700	Workshops & Training	10 000	20 000	5 000	5 000	40 000	u
				74200	Audio-visual & printing products	1 000	1 000	1 000	1 000	4 000	v
				71200	International consultants	27 500	19 310	8 190	11 000	66 000	w

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CHANGE RISK ANALYSIS.	DWA	62180	GEF (SCCF)	71600	Travel	6 000	6 000	3 000	3 000	18 000	x
				GEF Subtotal OUTCOME 3	64 360	35 240	38 050	200 200			
PROJECT MANAGEMENT UNIT	DWA	62180	GEF (SCCF)	Contractual Services Individ.	-	21 000	20 000	19 000	85 000	y	
				Professional services	74100	10 000	15 000	27 000	67 000	z	
				Equipment	72200	2 000	1 000	500	4 500	aa	
				Miscellaneous	74500	100	50	50	300	ab	
				Office supplies	72500	2 000	1 500	500	4 500	ac	
				Travel	71600	1 500	1 500	1 200	5 700	ad	
				<b>Total Management</b>		<b>40 600</b>	<b>40 100</b>	<b>38 050</b>	<b>167 000</b>		
<b>PROJECT TOTAL</b>				<b>633 528.5</b>	<b>551 419.5</b>	<b>289 997.5</b>	<b>195 055.5</b>	<b>1 670 000</b>			

**Summary of funds:**

	Amount Year 1 (US\$)	Amount Year 2 (US\$)	Amount Year 3 (US\$)	Amount Year 4 (US\$)	Total (US\$)
GEF	633 528.5	551 419.5	289 997.5	195 054.5	1 670 000
DWA (MNRE)	1 721 742	1 495 197	770 253	543 708	4 530 900
KOBWA	13 940	11 900	5 780	2 380	34 000
UNDP CO (TRAC 1.1)	424 000	318 000	159 000	159 000	1 060 000
UNDP CO (TRAC 1.1)	50 000	50 000	50 000	50 000	200 000
<b>TOTAL</b>	<b>2 843 210.5</b>	<b>2 426 516.5</b>	<b>1 275 030.5</b>	<b>950 142.5</b>	<b>7 494 900</b>

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**Budget notes:**

**Table 5.** Budget notes for Outcome 1: Institutional capacity for climate change adaptation strengthened through the integration of climate change risks into national water resources management policies and the establishment of inter-sectoral- coordination mechanisms based on inclusive and informed national dialogue

Budget Note	Description of cost item
<b>a.</b>	<p>Thirteen different National Consultants (NCs) will be contracted to work closely with ICs to support the assessments and training activities to be undertaken as part of Outcome 1 for a total cost of US\$43,750 (175 days at US\$250/day). These NCs are as follows:</p> <ul style="list-style-type: none"> <li>• Activity 1.1.1: hydrologist (14 days); socio-economist (10 days); GIS specialist (5 days); and policy expert (2 days);</li> <li>• Activity 1.1.2: groundwater specialist (20 days);</li> <li>• Activity 1.1.3: water expert (10 days);</li> <li>• Activity 1.1.4: crop production specialist (18 days) and policy expert (2 days);</li> <li>• Activity 1.1.6: geologist/soil scientist (15 days) and GIS specialist (10 days);</li> <li>• Activities 1.2.1 and 1.2.2 and 1.3.1: national institutional arrangements facilitator (35 days);</li> <li>• Activities 1.2.1 and 1.2.2: workshop facilitator (18 days);</li> <li>• Activities 1.3.1 and 1.3.2: climate change expert (8 days) and training facilitator (8 days).</li> </ul> <p>Funds are earmarked for 20.5% of the costs of the project management unit staff. Total cost is estimated at US\$38,000.</p>
<b>b.</b>	Funds are earmarked for: i) telephone, internet costs and electricity; and ii) contingencies, including unforeseen expenses incurred by currency fluctuations. Total cost is estimated at US\$300.
<b>c.</b>	Funds are earmarked for the dissemination of all assessments to stakeholders. Total cost is estimated at US\$3,970.
<b>d.</b>	Funds are earmarked for: i) the organisation of stakeholder meetings and working sessions (average 15 participants at unit cost of US\$30 for 15 days, costs estimated at US\$6,750); ii) organisation of forums and workshops (average 40 participants at unit cost of US\$30 for 10 days, costs estimated at US\$12,000); iii) training sessions (average 15 participants at unit cost of US\$30 for 3 days, costs estimated at US\$1,350). Total cost is estimated at US\$20,100.
<b>f.</b>	<p>Eight international consultants (ICs), including a Technical Advisor (TA), are to be hired by the project under Outcome 1 over the four year period for a total cost of US\$163,800 (273 days at US\$600/day). The ICs will be contracted to work closely with NCs to support the studies and training activities as follows:</p> <ul style="list-style-type: none"> <li>• Activity 1.1.1: water resource modeller (25 days) and natural resource economist (15 days);</li> <li>• Activity 1.1.4: agricultural economist (30 days);</li> <li>• Activity 1.1.1 and 1.1.2.: water expert (10 days);</li> <li>• Activity 1.1.6: sand dams expert (30 days);</li> <li>• Activities 1.1.1 - 1.1.4: climate change adaptation expert (25 days);</li> </ul>

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	<ul style="list-style-type: none"> <li>• Activity 1.2.2, 1.3.1 and 1.3.2: policy expert (18 days). A TA will be hired at a cost to Outcome 1 of US\$72,000 (120 days at US\$600/day) over the four years. The TA is expected to work with and advise the PM on: i) quality assurance and technical review of project outputs (e.g. studies and assessments); ii) drafting TORs for technical consultancies and supervision of consultants work; iii) monitoring the technical quality of project M&amp;E systems, including annual workplans, indicators and targets; iv) providing best suitable approaches and methodologies for achieving project targets and objectives; v) the work carried out by the other technical assistance consultants hired by the project; and vi) knowledge management, communications and awareness raising.</li> </ul>
g.	<p>Travel costs include travel of ICs to Swaziland and travel undertaken by all consultants in the country. The cost for an international trip is estimated at US\$1,500 with maximum trips of 13 over the four years, resulting in an estimated cost of US\$19,500. Additionally, daily subsistence allowance (DSA) estimated at US\$236/day for a total of 85 days is included in this figure (DSA cost at US\$20,060). Local trips for both NCs and ICs are estimated at US\$20 per 100 km. For an estimated mileage of 25,025 km over the four year duration of the project the cost is US\$5,005. Total cost is estimated at US\$44,565.</p>

**Table 6.** Budget notes for Outcome 2: Climate change risk management measures integrated into national water and agricultural programmes and implemented in pilot projects to promote adaptation on the ground

Budget Note	Description of cost item
h.	<p>Thirteen different National Consultants (NCs) will be contracted to work closely with ICs to support the implementation of and drafting of recommendations for national policies and programmes related to water and land use (NWP, IWRMP, land use planning) as well as key local level management and investments plans (KOBWA, CMPs, CDPs). This will be for a total cost of US\$178,500 (714 days at US\$250/day). These NCs are as follows:</p> <ul style="list-style-type: none"> <li>• Activity 2.1.1 and 2.1.2: water expert (42 days);</li> <li>• Activity 2.1.2: land use planner (22 days);</li> <li>• Activity 2.1.4: workshop facilitator (7 days) and policy expert (7 days);</li> <li>• Activity 2.1.5: crop production specialist (22 days);</li> <li>• Activity 2.1.6: water expert (12 days);</li> <li>• Activity 2.2.1: policy expert (7 days);</li> <li>• Activity 2.2.2: agricultural extension specialist (17 days); climate change expert (17 days) and land use planner (12 days);</li> <li>• Activity 2.2.3: climate change expert (22 days) and water expert (22 days);</li> <li>• Activities 2.3.1; 2.3.3; 2.3.4; 2.3.5 and 2.3.6: workshop facilitator (44 days)</li> <li>• Activity 2.3.2: agricultural extension specialist (30 days);</li> <li>• Activity 2.4.1: water expert (60 days);</li> <li>• Activity 2.4.2: climate change expert (12 days);</li> <li>• Activity 2.4.3: soil conservation specialist (60 days);</li> <li>• Activities 2.4.4 and 2.4.5: reforestation technician (70 days);</li> <li>• Activity 2.4.6: meteorologist (45 days);</li> </ul>



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	<ul style="list-style-type: none"> <li>• Activity 2.4.7: education specialist (12 days) and water expert (12 days);</li> <li>• Activity 2.4.8: workshop facilitator (20 days) and water expert (60 days); and</li> <li>• Activity 2.4.9: workshop facilitator (20 days) and soil conservation specialist (60 days).</li> </ul> <p>Funds are earmarked for 22 % of the costs of the project management unit staff. Total cost is estimated at US\$41,258.</p>
i.	<p>Funds are earmarked for the purchase of equipment for the implementation of on-the-ground adaptation measures (e.g. installation of rainwater harvesting systems, demonstrating rainwater infiltration techniques, installing basic weather stations and undertaking reforestation and restoration activities) in demonstration sites, as follows:</p> <ol style="list-style-type: none"> <li>1. <i>Rainwater harvesting</i>: The cost of the equipment (e.g. rainwater harvesting tanks) required for the installation of rainwater harvesting systems is US\$72,000 for the four demonstrations sites (US\$18,000 for each site).</li> <li>2. <i>Rainwater infiltration</i>: The cost of the equipment required for rainwater infiltration techniques is US\$72,000 for the four demonstrations sites (US\$18,000 for each site).</li> <li>3. <i>Small-scale weather stations</i>: The cost of the weather station equipment is US\$96,000 for two weather stations (US\$48,000 each). Total cost is estimated at US\$240,000.</li> </ol> <p>Funds are earmarked for the purchase of materials and goods for the following activities related to the reforestation activities: i) establishment of a nursery; and ii) clearing of AIPs and planting at Mkhwiwmi Inkhudla. Total cost is estimated at US\$64,500.</p> <p>Funds are earmarked for: i) telephone, internet costs and electricity; and ii) contingencies, including unforeseen expenses incurred by currency fluctuations. Total cost is estimated at US\$250.</p>
k.	<p>Funds are earmarked for the purchase of materials and goods for the following activities related to the reforestation activities: i) establishment of a nursery; and ii) clearing of AIPs and planting at Mkhwiwmi Inkhudla. Total cost is estimated at US\$64,500.</p>
l.	<p>Funds are earmarked for: i) telephone, internet costs and electricity; and ii) contingencies, including unforeseen expenses incurred by currency fluctuations. Total cost is estimated at US\$250.</p>
m.	<p>Funds are earmarked for: i) conducting workshops and working group sessions for the revision of policies, KOBWA flood management plans, SWADE CMPs and CDPs at a cost of US\$25,500 (30 days, US\$850/day); and ii) disseminating project outputs and lessons at a cost of \$10,900; iii) organising four workshops to dissemination projects outputs and lessons at a cost of US\$4,800 (US\$1,200 each); and iv) training sessions at a cost of US\$11,250 (average 15 participants, for 25 days, US\$30/day). Total cost is estimated at US\$52,450.</p>
n.	<p>Funds are earmarked for the dissemination of projects outputs and lessons learned. This includes development of newsletters, newspaper articles, booklets and pamphlets highlighting lessons learned and sensitizing the public on climate change adaptation Total cost is estimated at US\$19,200.</p>
o.	<p>Funds are earmarked for contractual labour for the implementation of on-the-ground adaptation measures in demonstration sites (approximately 3,617 man/days, 12/day). Total cost is estimated at US\$38,000.</p>
p.	<p>Ten ICs, including a Technical Advisor (TA), are to be hired by the project under Outcome 2 over the four year period for a total cost of US\$285,600 (476 days at US\$600/day). The ICs will help in supporting the implementation of and drafting of recommendations for national policies and programmes related to water and land use (NWP, IWRMP, land use planning) as well as key local level management and investments plans (KOBWA, CMPs, CDPs). Furthermore, they will provide technical assistance in implementing the selected on-the-ground adaptation measures at demonstration sites. The ICs will be contracted to work closely with NCs to support the studies and training activities as follows:</p> <ul style="list-style-type: none"> <li>• Activity 2.1.1 and 2.1.2 : policy expert (12 days);</li> <li>• Activity 2.1.3 and 2.1.4: climate change adaptation expert (16 days);</li> <li>• Activity 2.1.5: irrigation expert (20 days) and water expert (20 days);</li> <li>• Activity 2.1.6: water expert (25 days);</li> <li>• Activity 2.2.1: flood management expert (16 days);</li> <li>• Activity 2.2.2: environmental specialist (12 days) and climate change adaptation expert (30 days);</li> </ul>

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	<ul style="list-style-type: none"> <li>• Activity 2.2.3: climate change adaptation expert (40 days);</li> <li>• Activity 2.3.1; 2.3.2; 2.3.3; 2.3.4; and 2.3.5: climate change adaptation expert (54 days);</li> <li>• Activity 2.3.6: meteorologist: small weather stations expert (8 days);</li> <li>• Activities 2.4.1 and 2.4.3: water expert (24 days);</li> <li>• Activity 2.4.2: sand dams expert (10 days);</li> <li>• Activity 2.4.5: forest/landscape restoration expert (15 days);</li> <li>• Activity 2.4.6: meteorologist (16 days);</li> <li>• Activity 2.4.7: climate change adaptation expert (8 days); and</li> <li>• Activities 2.4.8 and 2.4.9: water expert (40 days).</li> </ul> <p>The TA will be hired at a cost of US\$66,000 (110 days at US\$600/day) over the four years.</p>
q.	<p>Travel costs include travel of ICs to Swaziland and travel undertaken by all consultants in the country. The cost for an international trip is estimated at US\$1,500 with maximum trips of 13 over the four years, resulting in an estimated cost of US\$19,500. Additionally, daily subsistence allowance (DSA) estimated at US\$236/day for a total of 122 days is included in this figure (DSA cost at US\$28,792). Local trips for both NCs and ICs are estimated at US\$20 per 100 km. For an estimated mileage of 101325 km over the four years duration of the project the cost is US\$20,265. Total cost is estimated at US\$68,557.</p>

**Table 7.** Budget notes for Outcome 3: Negotiations on trans-boundary water management for the Incomati, Maputo and Umbeluzi river basins informed by climate change risk analysis.

Budget Note	Description of cost item
r.	<p>Four different National Consultants (NCs) will be contracted to work closely with ICs to strengthen climate awareness of the Swaziland delegations and the development of a coherent, climate change-conscious strategy for Swaziland for the forthcoming agreement negotiations and long-term basin management. This will have a total cost of US\$40,000 (160 days for US\$250/day). These NCs are as follows:</p> <ul style="list-style-type: none"> <li>• Activity 3.1.1: hydrologist ( 30 days);</li> <li>• Activity 3.1.2 and 3.1.3: water expert (70 days);</li> <li>• Activity 3.2.1: policy expert (30 days); and</li> <li>• Activity 3.2.2: climate change expert (30 days).</li> </ul>
s.	<p>Funds are earmarked for 17 % of the costs of the project management unit staff. Total cost is estimated at US\$ 32,000.</p>
t.	<p>Funds are earmarked for: i) telephone, internet costs and electricity; and ii) contingencies, including unforeseen expenses incurred by currency fluctuations. Total cost is estimated at US\$200.</p>
u.	<p>Funds are earmarked for: i) meetings and working groups' sessions related to the development of strategic and position papers, estimated at US\$17,000 (20 days, US\$850/day); ii) community meetings at each of the five river basins at a cost of US\$10,000 (US\$2,000 each); and iii) two workshops for the validation and dissemination of strategic and positions paper which include participants from neighbouring countries at an estimated cost of US\$13,000 (US\$6,500 each). Total cost is estimated at US\$40,000.</p>

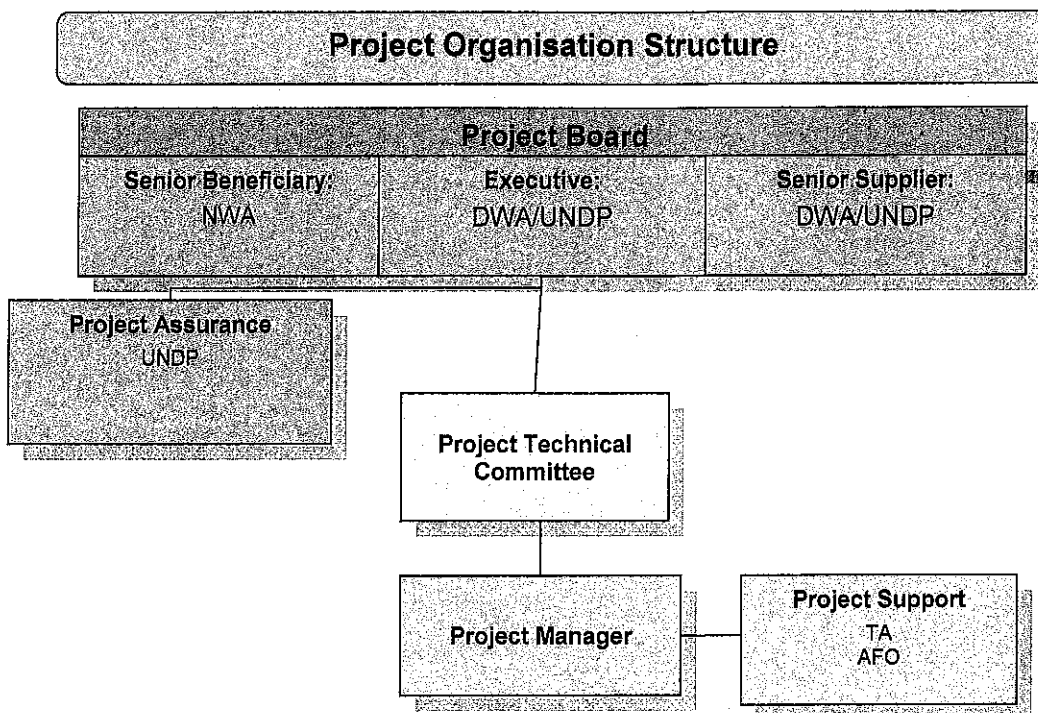
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v.	Funds are earmarked for audio-visual equipment which is required for workshops, working groups and communities meetings. The cost of this equipment is estimated at US\$2,000. Additionally, US\$2,000 is earmarked for the production of all documents for the awareness material (booklets, pamphlets, etc.). Total cost is estimated at US\$4,000.
w.	<p>Three ICs, including a Technical Advisor (TA), are to be hired by the project under Outcome 3 over the four year period for a total cost of US\$66,000 (110 days at US\$600/day). The ICs will be contracted to work closely with NCs to support the studies and training activities as follows:</p> <ul style="list-style-type: none"> <li>• Activity 3.1.1: water resource modeler (35 days);</li> <li>• Activity 3.1.2 and 3.1.3: policy expert (40 days);</li> </ul> <p>A Technical Advisor (TA) will be hired at a cost to the Outcome 3 of US\$21,000 (35 days for US\$600/day) over the four years.</p>
x.	Travel costs include travel of ICs to Swaziland and travel undertaken by all consultants in the country. The cost for an international trip is estimated at US\$1,500 with a maximum number of 4 trips over the four years, resulting in an estimated cost of US\$6,000. Additionally, daily subsistence allowance (DSA) estimated at US\$236/day for a total of 35 days is included in this figure (DSA cost at US\$8,260). Local trips for both NCs and ICs are estimated at US\$20 per 100 km. For an estimated mileage of 18,700 km over the four years duration of the project the cost is US\$3,740. Total cost is estimated at US\$18,000.

**Table 8.** Budget notes for Outcome 4: Project management and M&E.

Budget Note	Description of cost item
y.	Funds are earmarked for 17 % of the costs of the project management unit staff. Total cost is estimated at US\$73,700.
z.	M&E costs of US\$80,000 (see M&E workplan and budget).
aa.	Funds are earmarked for computer hardware and software and other equipment. Total cost is estimated at US\$4,500.
ab.	Funds are earmarked for contingencies, including unforeseen expenses incurred by currency fluctuations. Total cost is estimated at US\$300.
ac.	Funds are earmarked for: i) fuel costs; ii) services, office maintenance and supplies; iii) security and insurance costs; and iv) banking costs and incidental expenses. Total cost is estimated at US\$4,500.
ad.	Funds are earmarked for travel for senior PMU staff for preparatory and monitoring visits to demonstration sites. Total cost is estimated at US\$4,000.

## 5. Management Arrangements



161. The project will be implemented following the National Implementation (NIM) modality, over a four year period approximately three months following CEO Endorsement. This three month period will allow time for recruitment of project staff. The MNRE (DWA) will be the implementing partner of the project. DWA will collaborate with the MTEA (NMS) and the MOA (SWADE) to implement project activities. UNDP, to which the DWA will be accountable, will support the project implementation and oversight, according to the UNDP regulations and procedures.

162. The DWA will appoint a responsible person (i.e. the Project Board Executive) to supervise and coordinate the government's contribution to the project. Such a person will work in close collaboration with the Project Management Unit and will be responsible for processing the requests for advance and the production of financial reports, in compliance with the rules and procedures of UNDP. The appointee is anticipated to be a senior executive of the MNRE.

163. The management arrangements will seek to establish a bridge between: i) national authorities responsible for formulating and integrating climate change policies; ii) national, regional and local authorities responsible for project implementation; and iii) on-the-ground practitioners of IWRM. Continuous monitoring of project progress at all levels will ensure that the project's activities are always aligned with the project's goal and objective. The project will be managed as follows:

### Project Board

164. The PB is the highest decision making body for the project, and will be responsible for high-level, strategic direction of the project, approves the project budget and work plan, ensures that the project positively impacts on the growth and development objectives of the country. The PB also ensures the project activities and expected impacts are effectively mainstreamed in the

relevant national policies and strategies. The PB will meet at least once a year, and will meet more often as deemed necessary. As the implementing partner, the DWA will ensure that this committee is kept up-to-date with developments. Meetings of the PB will be chaired by a representative of the MNRE.

165. The PB will be responsible for the overall supervision of project implementation and will form the main decision-making body of the project. It will therefore provide guidance to project implementation and ensure realisation of the project's objective. It will also guide and oversee the progress of the project and review delivery targets and budgetary issues. The PB will play a critical role in project monitoring and evaluation by assuring the quality of these processes and products, and using evaluations for performance improvement, accountability and learning. Furthermore, the PB will ensure that required resources are committed and will arbitrate on any conflicts within the project or negotiate solutions to any problems encountered with external bodies. The PB will also consider and approve the Annual Work Plans and approve any deviations from the original plans, if deemed necessary. Furthermore, the PB will oversee that all the ministries and departments are complying with the project commitments. PM will serve as a secretariat to the PB.
166. In order to ensure UNDP's ultimate accountability for the project results, the PB's decisions will be made in accordance with standards that ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. If consensus cannot be reached within the PB, the final decision shall rest with the UNDP Regional Technical Advisor.
167. Membership and Terms of Reference for the PB will be reviewed during the inception period and recommended for approval during the first PB meeting. Representatives of other stakeholders can be included in the PB as appropriate. The PB contains four distinct roles, including:
- **An Executive:** the individual/institution representing the government's ownership of the project. The executive will likely be a member of the DWA or UNDP.
  - **Senior Supplier:** the individual/institution representing the interests of the parties who will be providing funding for specific cost sharing projects and/or technical expertise to the project. The Senior Supplier's primary function within the PB is to provide guidance regarding the technical feasibility of the project. The Senior Supplier will likely be a member of the DWA, other government partners who are responsible for the co-financing projects/programmes and/or UNDP.
  - **Senior Beneficiary:** the group of individuals or institutions representing the interests of those who will ultimately benefit from the project. The Senior Beneficiary's primary function within the Board is to ensure the realisation of project results from the perspective of project beneficiaries. The Senior Beneficiary will likely be the NWA.
  - The individuals/institutions that will fulfil the **Project Assurance** role will support the Project Board Executive by carrying out objective and independent project oversight and monitoring functions. The Project Assurance role will be carried out by the UNDP.

#### **Project Technical Committee**

168. The project will be guided in its technical work by a multi-stakeholder Project Technical Committee (PTC) which will be established as an advisory body at the outset of the project. The PTC will draw its representation from a number of stakeholder institutions and will report to the

project's executive body, the PB. The composition of the PTC will include members from *inter alia* MOA, MEPA, MTEA, NDMA, NWA, MNRE and SWADE. The PTC will be responsible for making technical recommendations for the project, in particular when guidance is required by the Project Manager (PM), who will serve as the secretary to the PTC. The PTC will meet once per quarter or more frequently if deemed necessary by the DWA and UNDP CO. The membership and the Terms of Reference of the PTC will be reviewed during the inception phase and recommended for approval during the first PB meeting.

### **The project team**

169. The project team will be housed within the DWA (MNRE) and responsible for a day-to-day management of the project. The project team is responsible to produce quarterly progress and financial reports and keep the DWA and PB updated with the project progress. It also needs to alert them when there are any risks emerging which affect the project's ability to achieve its intended objective and outcomes. The project team is responsible to submit any other information that will allow PB and PTC to function effectively on their Terms of References. The project team will comprise the following individuals:

#### **Project Manager (PM)**

170. The PM has the authority to run the project on a day-to-day basis on behalf of the Implementing Partners within the boundaries laid down by the PB. The PM's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The PM will also be responsible to ensure required inputs are procured in a timely manner so that the approved work plan will be implemented as scheduled. Clear communication channels and reporting lines need to be established to guarantee that the decentralised design of this project will be successful. It is important that the implementation experiences from the regions feed into the national level activities of the project. The PM will be responsible for overall management, reporting and financial management according to UNDP guidelines. The PM will guide and supervise the work to be conducted by national and international consultants, who will be hired to support project implementation. Importantly, the PM will liaise with both the PTC and the DWA's technical personnel where necessary to ensure technical integrity of the project in the context of Swaziland.

#### **Technical Advisor (TA)**

171. A TA will be hired on a part-time basis to provide technical advice on the implementation of the project to the PM. The TA will also assist the PM in leading the project. The TA will fulfil the following functions: i) quality assurance and technical review of project outputs (e.g. studies and assessments); ii) assistance in drafting TORs for technical consultancies and supervision of consultants work; iii) assistance in monitoring the technical quality of project M&E systems, including annual workplan and indicators and targets in the log-frame; iv) advice provision on best suitable approaches and methodologies for achieving project targets and objectives; v) technical supervision of the work carried out by the other technical assistance consultants hired by the project; and vi) assistance in knowledge management, communications and awareness raising.

#### **The Administrative and Financial Officer (AFO)**

172. The AFO will work under the direct supervision of the PM and will be based at the national coordination office. She/he will be responsible for the administrative and financial matters related to the project's implementation, including *inter alia*: i) preparing budgetary revisions where necessary; ii) preparing the annual work plans in Atlas format; iii) standardising and undertaking the project's accounting procedures; and iv) preparing status, progress and other financial reports. As such, she/he will assist the PM in the effective execution of the project.

173. Terms of Reference (TOR) for the committees and positions critical for the management of the project are included in Annex 3. Additionally, the stakeholder involvement plan is included in Annex 2.

### **Working with river basin institutions**

174. River Basin Authorities (RBAs) will be consulted and involved in almost all the components of the project. RBAs are represented in the NWA, and the DWA is the secretariat to the NWA. The DWA therefore know and work with all chairpersons of the RBA. The Water Control Section of the DWA also works with all the RBAs and is responsible for the allocation and management of water resources in the different basins, and will therefore know the key contacts in each river basin. Where feasible, a RBA will assign a staff member to work with the project in delivering an activity in their area. The project's progress will be reported in the meetings of the RBAs. This will also ensure that implementation of the project is not detached from institutional set up established by the Water Act, and could enhance follow-up and up-scaling of activities. The RBAs and WUAs are also the immediate institutions that can benefit from the lessons from the application of each activity in their respective areas.

## **6. Monitoring Framework and Evaluation**

175. The project will be monitored through the following M&E activities:

### **Project start:**

176. A Project Inception Workshop will be held within 2 months after the PMU is established, with participation of a wide range of stakeholders, those with assigned roles in the project organisation structure, UNDP. The Inception Workshop is crucial to building ownership for the project results, sensitize the stakeholders about the project objective and outcomes, and to facilitate further inputs in the project's overall work plan to ensure that the project will fit sufficiently within the current context of Swaziland and its overall development plans and strategies.
177. The Inception Workshop should address a number of key issues including:
- Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of the Government, the Project Team, and UNDP. Discuss the membership, roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms.
  - Review the project log-frame and agree on the indicators, targets and their means of verification, and review and revises assumptions and risks if necessary.
  - Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements for UNDP-GEF projects. The M&E work plan and budget should be agreed upon and scheduled.
  - Discuss financial reporting procedures and obligations, and arrangements for annual audit.
  - The Audit will be conducted in accordance with UNDP Financial Regulations and Rules and applicable audit policies on UNDP projects.
  - Based on the project results framework and the relevant GEF Tracking Tool as appropriate, review the first annual work plan.
  - Agree on a set of recommendations to be tabled at the PB meeting. The first PB meeting should be held soon after the inception workshop to review a set of recommendations from the inception workshop and make necessary decisions for the project.

178. An Inception Workshop report as well as the minutes from the first PB meeting are key reference documents and must be prepared and shared with participants to formalise various agreements and plans decided during the project's inception phase.

**Quarterly:**

- Progress and Financial Report will be prepared by the Project Team and submitted to UNDP via the Implementing Partner (DWA/MNRE). Quarterly Reports is prepared in the format advised by UNDP and should contain sufficient information to keep track of the project progress in the various monitoring mechanisms, including the following:
- Progress will be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high.
- Based on the information recorded in ATLAS, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor *inter alia* issues, lessons learned. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

**Annually:**

- Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period. The APR/PIR combines both UNDP and GEF's annual reporting requirements.

The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative).
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- Financial delivery status. For mid-term and final PIR, the co-financing information will be also included.
- Risk and adaptive management.
- ATLAS QPR.
- Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

**Periodic monitoring through site visits:**

179. UNDP will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the PB may also join these visits. A Field Visit Report/BTOR will be prepared by UNDP and circulated no less than one month after the visit to the project team and Project Board members.

**Mid-term of project cycle:**

180. The project will undergo an independent Mid-Term Evaluation (MTE) at the mid-point of project implementation. The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. The relevant Tracking Tools will also be completed during the MTE exercise. Findings from this evaluation will be incorporated as recommendations for enhanced implementation during the remaining project's implementation period. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance



from the UNDP-GEF Regional Coordinating Unit and finalized through consultation among the parties to the project document. UNDP is responsible to develop a management response once the final MTE Report is submitted. The MTE Report as well as the management response will be uploaded to UNDP corporate systems (the UNDP Evaluation Office Evaluation Resource Center (ERC)) and GEF website.

**End of Project:**

181. An independent Final Evaluation will take place three months prior to the project's operational closure and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of climate change adaptation benefits that the project aims to achieve. The relevant Tracking Tools will also be completed during the final evaluation. The TOR for this evaluation will be prepared by the UNDP CO based on guidance from the UNDP-GEF Regional Coordinating Unit and finalized through consultation among the parties to the project document.

182. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

183. During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

**Learning and knowledge sharing:**

184. Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and fora. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyse, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Finally, there will be a two-way flow of information between this project and other projects of a similar focus in southern Africa or beyond.

**M&E workplan and budget**

Type of M&E activity	Responsible Parties	Budget/US\$ <i>(excluding project team staff time)</i>	Time frame
Inception Workshop and Report	<ul style="list-style-type: none"> <li>▪ Project Manager</li> <li>▪ UNDP CO, UNDP CCA</li> </ul>	Indicative cost: US\$8,000	Within first two months of project start up
Measurement of Means of Verification of project results.	<ul style="list-style-type: none"> <li>▪ UNDP CCA RTA/PM will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members</li> </ul>	Gender sensitive and Vulnerability assessments: US\$ 13,000	Start, mid and end of project (during evaluation cycle) and annually when required
Measurement of Means of	<ul style="list-style-type: none"> <li>▪ Oversight by PM</li> <li>▪ Project team</li> </ul>	To be determined as part of the Annual Work	Annually prior to ARR/PIR and to

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Type of M&E activity	Responsible Parties	Budget US\$ <i>(including travel and other expenses)</i>	Time frame
Verification for Project Progress on <i>output and implementation</i>		Plan's preparation.	the definition of annual work plans
ARR/PIR	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ UNDP CO</li> <li>▪ UNDP RTA</li> <li>▪ UNDP EEG</li> </ul>	None	Annually
Periodic status/ progress reports	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> </ul>	None	Quarterly
Mid-term Evaluation	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ UNDP CO</li> <li>▪ UNDP RCU</li> <li>▪ External Consultants (i.e. evaluation team)</li> </ul>	Indicative cost: US\$ 25,000	At the mid-point of project implementation
Final Evaluation	<ul style="list-style-type: none"> <li>▪ Project manager and team,</li> <li>▪ UNDP CO</li> <li>▪ UNDP RCU</li> <li>▪ External Consultants (i.e. evaluation team)</li> </ul>	Indicative cost : US\$ 25,000	At least three months before the end of project implementation
Project Terminal Report	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ UNDP CO</li> <li>▪ local consultant</li> </ul>	None	At least three months before the end of the project
Visits to field sites	<ul style="list-style-type: none"> <li>▪ UNDP CO</li> <li>▪ UNDP RCU (as appropriate)</li> <li>▪ Government representatives</li> </ul>	For GEF supported projects, paid from IA fees and operational budget	Yearly
<b>TOTAL indicative COST</b> Excluding project team staff time and UNDP staff and travel expenses		US\$ 80,000	

## **7. Legal Context**

185. This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA (signed on 28 October 1977) and all CPAP provisions apply to this document. Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

186. The implementing partner shall:

- a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- b) assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

187. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

188. The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999).

189. The Audit will be conducted in accordance with UNDP Financial Regulations and Rules and applicable audit policies on UNDP projects.

## 8. Annexes

### Annex 1. Risk analysis

#	Description of the risk	Potential consequence	Countermeasures / Mng't response	Type (Risk category)	Probability & Impact (1-5)
1	The NCCC may remain a committee which is not gazetted.	This may impact the effectiveness of NCCC as an inter-sectoral forum for policy dialogues.	A central component of the project is to strengthen the capacity of the NCCC, and in particular, analyse options for its institutional development in order to strengthen its coordination function. While the project will, during its implementation, assist the government to enhance the legal status of the NCCC, if the required gazetting process is deemed very slow, then the project will need to determine whether NCCC will remain the best forum to work with or the project will have to identify another coordination forum to achieve the project outcomes. The project steering committee will advise the project on this point.	Political	P=3 I=2
2	Lack of involvement and co-operation of stakeholders to provide the project team with data.	This will result in incomplete data collection and/or duplication of efforts, which may lead to delays in the completion of the outputs.	Clear commitment of the relevant ministries and other stakeholders regarding data collection and sharing of data will be sought through PSC members and meetings.	Operational	P=2 I=4
3	Lack of clarity among stakeholders as regards to roles in the project.	This will lead to an uncoordinated approach to tackling climate change, which will be a threat to successful project implementation.	Stakeholder roles are detailed clearly in the stakeholder involvement plan. This plan will be presented, discussed and confirmed during the Inception Workshop.	Operational	P=2 I=2
4	Lack of political will to support the project at the highest decision making level	This will threaten the project's sustainability.	Project Steering Committee is constituted at sufficiently high level of government representation to ensure the engagement of high level policy makers in the project implementation.  Awareness will be raised among the decision-makers. Leaders/champions for climate change will be identified and developed.	Political and strategic	P=1 I=3

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			<p>A strong stakeholder involvement plan has been developed (and will be confirmed during the Inception Workshop) to provide support to the project.</p> <p>Support will be given to government to organise consultations on project progress at key stages in order to maintain government ownership and commitment to the project.</p>		
5	Communities may not adopt reforestation activities and other adaptations measures (e.g. rainwater harvesting, rainwater infiltration techniques).	This will serve as a threat to the implementation and success of project activities.	<p>On-the-ground adaptation measures were selected through consultations with communities and hence are likely to be readily adopted. Throughout the project lifetime, the project will avoid a 'top down' approach and seek to create community ownership of all adaptations measures through participatory planning.</p> <p>Raising the awareness of communities of the benefits associated with reforestation and adaptation measures is central to the activities piloted by the project.</p> <p>The project team will build on experiences from other projects undertaking similar activities to promote good practice, and reduce this risk.</p>	Operational	P=2 I=4
9	High turnover of staff members in implementing agencies may negatively impact on project deliverables.	This will threaten the timely implementation of activities.	The project will build partnerships between government and non-government agencies (e.g. SWADE) to ensure continuity.	Political and organisational	P=3 I=2
10	Competing activities for land use could cause disagreement with regards to the implementation of adaptation measures.	This will hinder the implementation of identified adaptation measures.	The project will, through the collaboration with SWADE, work in close collaboration with the local communities and accepted traditional leaders (chiefs) to avoid disagreements over land use.	Operational and political	P=2 I=3
11	Trees planted by the project are cut down by the communities.	This will hinder the success of reforestation and restoration activities under Outcome 2 and their ability to showcase adaptation-related benefits.	Community involvement (i.e. 'bottom up' approach) and awareness-raising will be undertaken to avoid this risk.	Operational	P=2 I=3

## **Annex 2. Stakeholder involvement plan**

At its meeting in April 1996, the GEF Council approved the principles of public involvement in the design, implementation, and evaluation of GEF-financed projects. The Council stressed that when applying the principles, there should be emphasis on local participation and local stakeholder<sup>142</sup>. When done appropriately, public or stakeholder involvement improves the performance and impact of projects by:

- enhancing stakeholder ownership of, and accountability for, project outcomes;
- addressing the social and economic needs of affected people;
- building partnerships among project executing agencies and stakeholders; and
- making use of skills, experiences, and knowledge, in particular, of non-governmental organizations (NGOs), community and local groups, and the private sector in the design, implementation, and evaluation of project activities.

Public involvement consists of three related, and often overlapping, processes: information dissemination, consultation, and "stakeholder" participation. Stakeholders are the individuals, groups, or institutions that have an interest or stake in the outcome of a GEF-financed project<sup>143</sup>. The Project Identification Form (PIF) clearly identifies key implementation stakeholders for the present project as being the MNRE, MTEA (Department of Meteorology) and the MOA (SWADE). Stakeholder consultation has revealed that there are many other stakeholders who will play pivotal roles in delivering the desired project outcomes and outputs.

Some of the proposed interventions are pitched at a strategic level while others are for local areas, but with a view to learn from their implementation for further up-scaling of the successful ones. In broad terms, the project stakeholders can also be grouped as i) implementers; or ii) beneficiary stakeholders. In many instances the implementers are also beneficiaries.

Amongst the beneficiary stakeholders there are those who are directly impacted and those who are indirectly impacted. Some are part of the input while others are part of the process that generates the output. Others are an output /product of this process while others are beneficiaries of the product. An institution such as the proposed water Working Group to support the work of the NCCC is an example such a product/output of the system. The beneficiary stakeholder may also be part of the input or the process (although in practice the process may be non-linear and iterative). Stakeholder involvement will therefore be based on the understanding of the role that the concerned stakeholder can play in each of the phases of implementation of the planned activity. Figure 1 below is a visual presentation of such a system.

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<sup>142</sup> [http://www.thegef.org/gef/public\\_involvement](http://www.thegef.org/gef/public_involvement)

<sup>143</sup> [http://www.thegef.org/gef/public\\_involvement](http://www.thegef.org/gef/public_involvement)



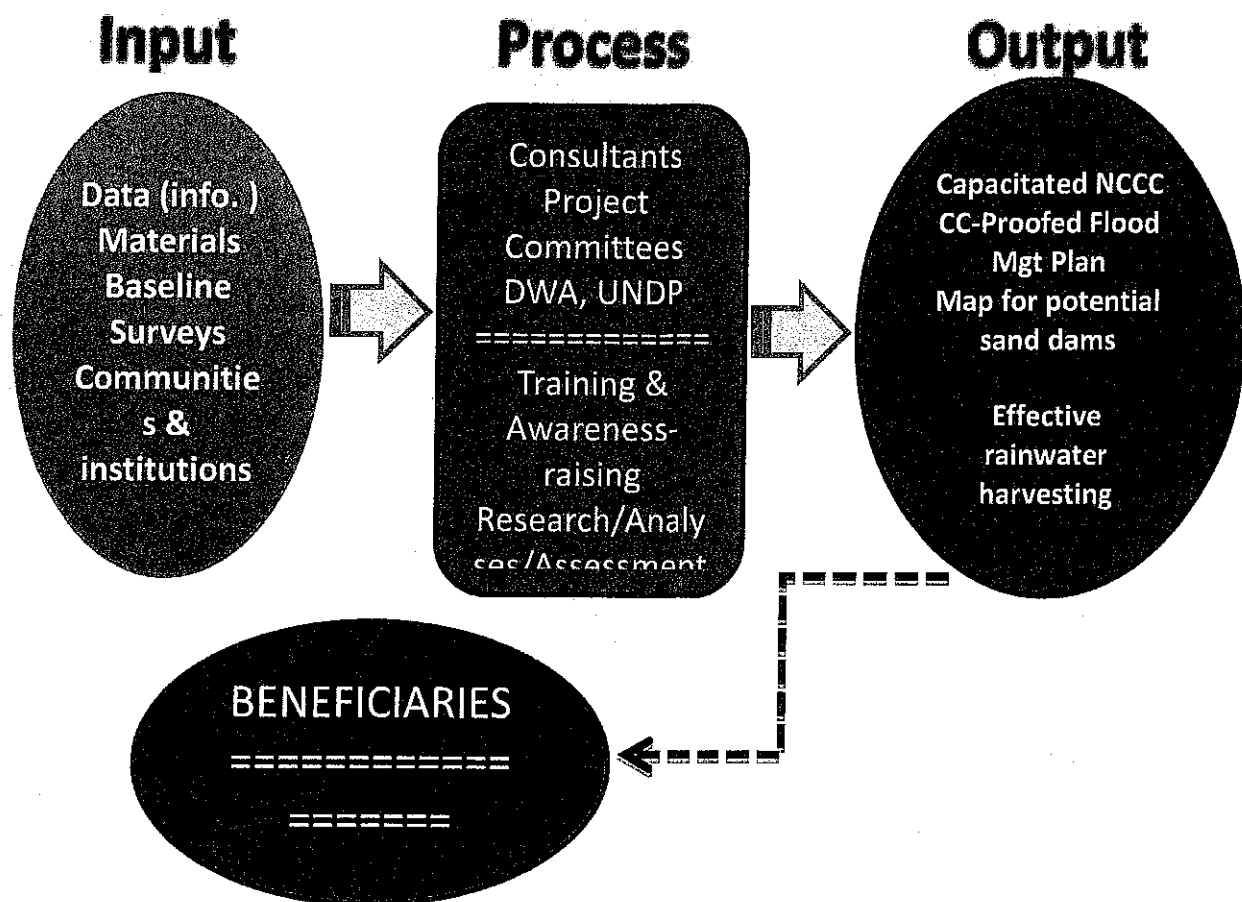


Figure 1: Stakeholder consultation process in a system perspective.

A wide range of other government institutions will be involved where necessary and possible, particularly for their scientific and technical background. It is important that the various outputs that will be delivered under the various project outcomes fully integrate the expertise available in the country and improve upon what is presently available, whilst also providing a platform for knowledge exchange and mutual learning.

The table below details the institutions and stakeholders involved in each particular project output.

Outcome	Output	Stakeholders involved
Outcome 1: Institutional capacity for climate change adaptation strengthened through the integration of climate change risks into national water resources management policies and the establishment/strengthening of inter-sectoral- coordination mechanisms based on inclusive and informed national dialogue	Output 1.1: Key scientific knowledge gaps on climate change impacts within the water sector defined, targeted research to fill knowledge gaps carried out, climate change response options identified, and main findings and strategic recommendations disseminated to at least twenty (20) relevant organisations across sectors (incl. KOBWA, MNRE, MoA, MoEPD, MoF, MoH, MoPSI, MTEA, NCCC, NDMA, NMS, NWA, RBAs, SEA, SWADE, SZWP, TPTC)	Department of Water Affairs, National Disaster Management Agency, National Meteorological Services, University of Swaziland (UNISWA), Komati Basin Water Authority, Ministry of Agriculture, National Climate Change Committee, River Basin Authorities, Swaziland Water and Agricultural Development Enterprise, Ministry of Tourism and Environmental Affairs, Swaziland Environmental Authority.

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	Output 1.2: A set of tailor-made climate change response measures related to national (and trans-boundary) water management identified and integrated into at least three (3) national level policies related to water resources management (e.g. NWP, IWRMP, draft National Climate Change Policy) through a series of national policy dialogue workshops (incl. with organisations listed under Output 1.1 and using strategic recommendations from that output)	National Climate Change Committee, Ministry of Tourism and Environmental Affairs, Department of Water Affairs, National Meteorological Services, Komati Basin Water Authority, River Basin Authorities, Ministry of Education (MOE), National Water Authority.
	Output 1.3: Institutional needs for inter-sectoral cooperation identified (through national dialogue - Output 1.2), appropriate national inter-sectoral coordination mechanism clearly defined, establishment/strengthening of national coordination mechanism supported and capacity of key staff/ stakeholders strengthened through at least three (3) targeted training courses on inter-sectoral coordination	National Water Authority, Department of Water Affairs, National Climate Change Committee, River Basin Authorities.
Outcome 2: Climate change risk management measures integrated into national water and agricultural programmes and implemented in pilot projects to promote adaptation on the ground	Output 2.1: Guidelines for mainstreaming climate change risks into key national policies (NWP, IWRMP, NCCP) developed, toolkits on practical application of climate change response measures (identified through Output 1.2) developed and at least five (5) targeted training courses on toolkit application delivered	Komati Basin Water Authority, Department of Water Affairs, River Basin Authorities, Ministry of Agriculture
	Output 2.2: Programme/ project specific climate change risks and tailor-made response measures identified and integrated into at least three (3) major management/ investment plans implemented in Swaziland (incl. KDDP, LUSIP and CDPs developed under the GEF SLM programme implemented by SWADE)	Department of Water Affairs, Ministry Natural Resources and Energy, Ministry of Agriculture, Swaziland Water and Agricultural Development Enterprise, Komati Basin Water Authority River Basin Authorities, Water User Associations, Swaziland Environmental Authority.
	Output 2.3: Capacity of key stakeholders and water resources management and/or agricultural development practitioners to integrate climate change risks into their activities strengthened by incorporating the climate risks/responses measures (identified under Output 2.2) into the ongoing training courses offered as part of ongoing national programmes (e.g. KDDP, LUSIP).	Swaziland Water and Agricultural Development Enterprise, Water User Associations, Ministry of Agriculture, Department of Water Affairs, River Basin Authorities, Komati Basin Water Authority
	Output 2.4: Community based climate resilience projects implemented in pilot sites, including the installation of rainwater harvesting systems in at least four (4) identified communities/ areas and rainwater infiltration improvement schemes (incl. reforestation) in at least four (4) communities/areas	Water User Associations, River Basin Authorities, Neighbourhood Care Points, Tinkhundlas, Ministry of Tinkhundla Affairs, pilot schools, Komati Basin Water Authority, Department of Water Affairs, Ministry of Agriculture, Ministry of Environment, Swaziland Environment Authority, Private Sector, NGOs.
Outcome 3: Negotiations	Output 3.1: Climate change impacts on	Joint Water Commissions <sup>144</sup> ,

<sup>144</sup>It should be noted that this is regarding the Swaziland delegation to the Joint Water Commission (JWC) and



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<p>on trans-boundary water management for the Incomati, Maputo and Umbeluziriver basins informed by climate change risk analysis.</p>	<p>trans-boundary water resource management (TWRM) and negotiation options assessed, tailor-made (short-, mid- and long-term) TWRM strategy paper for Swaziland developed through consultations with key stakeholders (as integral part of national policy dialogue - Output 1.2) and position paper for Swaziland TWRM negotiation team(s) jointly developed (with negotiators)</p>	<p>Tripartite Permanent Technical Committee<sup>145</sup>, Department of Water Affairs, NWA, National Water Authority.</p>
	<p>Output 3.2: Targeted information briefs on projected climate change impacts on TWRM developed and disseminated to senior decision-makers in at least twenty (20) relevant organisations, including key water user groups</p>	<p>Joint Water Commissions<sup>146</sup>, Tripartite Permanent Technical Committee<sup>147</sup>, Department of Water Affairs, National Water Authority, Komati Basin Water Authority, major water users, including sugar industry</p>

The Tripartite Permanent Technical Committee (TPTC) and not those of South Africa and Mozambique, as that is out of the geographical scope of the project.

<sup>145</sup> Ibid.

<sup>146</sup> Ibid.

<sup>147</sup> Ibid.

### **Annex 3. Terms of reference for key project organs and project staff**

#### **A. Project Board (PB)**

The PB will be established by the DWA and will meet at least once a year, though they may meet more frequently if the need arises. The PB will be made up of representatives of the following institutions:

- MNRE
- MOA
- MEPD
- MTEA
- Forestry MTEA
- NDMA
- NCCC
- NWA
- DWA
- SWADE
- PPO, MNRE
- SEA
- UNDP

Additionally, representatives from relevant NGOs and private sector companies may be represented on the PB, as and when deemed necessary or appropriate by the PB members.

#### ***Responsibilities***

- Providing high level strategic direction of processes of the project
- Monitoring that the project positively impacts the growth and development objectives of the country.
- Establishing policies to define the functions, responsibilities, and delegation of powers for the implementing agencies and the project team.
- As the highest executive body for the project's governance, making management decisions on issues brought to its attention by the PTC, the Project Board Executive or PM.

#### **B. Project Board Executive**

The DWA will appoint a Project Board Executive who will be responsible, on behalf of the government, for the project.

#### ***Responsibilities***

- Ensuring effective partnership between the implementing ministries.
- Ensuring that project activities are integrated and coordinated with the established operations of the DWA at the national level.
- Developing and maintaining close linkages with relevant sectoral government agencies, UNDP, NGOs, civil society, international organisations and implementing partners of the project.
- Supervising and leading the project team in carrying out their duties at an optimum level through ensuring efficient and effective resource utilisation.
- Guiding and overseeing the progress of the project and review delivery targets and budgetary issues.
- Reviewing and approving the Annual Work Plans and approving any deviations from the original plans, if deemed necessary.

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- Ensuring that all the ministries and departments are complying with the project commitments.

### **C. Project Manager (PM)**

The PM will report to the Project Board Executive and will lead the project team through the planning, implementation, and delivery of policies, reports, knowledge products, and other results approved in the project document and annual work plans. The PM will provide overall operational management for the successful execution and implementation of the programme. The PM will be responsible for financial management and disbursements, with accountability to the government and UNDP. The PM will also work closely with the staff from *inter alia* SWADE, MTEA, MNRE, NMS, MOA, NCCC, SZWP, RBA, WUA and NDMA. Additionally, the PM will work closely with the TA (see below).

#### ***Responsibilities***

- Facilitating the day-to-day functioning of the project staff.
- Managing human and financial resources in consultation with the Project Board Executive to achieve results in line with the outputs and activities outlined in the project document.
- Leading the preparation and implementation of annual results-based work plans in line with indicators and targets specified in the logical framework endorsed by the management.
- Coordinating project activities with related and parallel activities both within DWA and with other government and parastatal projects/programmes.
- Monitoring project activities, including financial matters, and preparing quarterly progress reports, and organising quarterly progress reviews.
- Supporting the Project Board Executive in organising PB and PTC meetings and recording the minutes of the meetings.
- Coordinating the distribution of responsibilities amongst team members and organising the monitoring and tracking systems.
- Reporting and providing feedback on project strategies, activities, progress, and barriers to UNDP, PB and the PTC.
- Managing relationships with project stakeholders including donors, NGOs, government agencies, and others as required.

### **D. Project Technical Committee (PTC)**

The project will be guided in its technical work by a multi-stakeholder Project Technical Committee (PTC) which will be established at the outset of the project. PTC will make recommendations to PB on the technical aspects of the project implementation. Members of the PTC will include representatives of the following institutions:

- US MOA
- US MEPD
- NCCC
- NDMA
- PPO MNRE
- SWADE
- UNDP
- DWA
- MET MTEA

### ***Responsibilities***

- Facilitating coordination of project activities across institutions.
- Providing technical guidance to project implementation and ensure realisation of the project's main objectives.
- Facilitating procurement of professional service providers (consultants), materials and goods.
- Assuring the quality of these processes and products, and using evaluations for performance improvement, accountability and learning.
- Ensuring that required resources are committed and arbitrating on any conflicts within the project or negotiate solutions to any problems encountered with external bodies.
- Develop recommendations for PB approval as and when required.

### **E. Technical Advisor (TA)**

The TA will provide technical advice on the implementation of the project to the PM on a part-time basis. The TA may be sourced as an international consultant if the technical expertise required is not available in Swaziland.

### ***Responsibilities***

- Undertaking technical review of project outputs (e.g. studies and assessments).
- Assisting in the drafting of TORs for technical consultancies.
- Assisting in supervising the work of consultants.
- Assisting in monitoring the technical quality of project M&E systems (including AWP, indicators and targets).
- Providing advice on best suitable approaches and methodologies for achieving project targets and objectives.
- Providing a technical supervisory function to the work carried out by the other technical assistance consultants hired by the project.
- Assisting in knowledge management, communications and awareness raising.

### **F. Administrative and Financial Assistant**

One administrative and financial assistant will report to PM.

### ***Responsibilities***

- Standardise the finance and accounting systems of the project while maintaining compatibility with the government, and UNDP financial accounting procedures.
- Prepare budget revisions of the project budgets and assist in the preparation of the annual work plans.
- Comply and verify budget and accounting data by researching files, calculating costs, and estimating anticipated expenditures from readily available information sources, in particular partner agencies.
- Prepare status reports, progress reports and other financial reports.
- Process all types of payments requests for settlement purposes including quarterly advances to the partners upon joint review.
- Prepare periodic accounting records by recording receipts, disbursements (ledgers, cash books, vouchers, etc) and reconciling data for recurring or financial special reports and assist in preparation of annual procurement plans.
- Undertake project financial closure formalities including submission of terminal reports, transfer and disposal of equipment, processing of semi-final revisions, and support professional staff in preparing the terminal assessment reports.

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- Assist in the timely issuance of contracts and assurance of other eligible entitlements of the project personnel, experts, and consultants by preparing annual recruitment plans.

**Annex 4. Capacity assessment**

**Capacity Assessment: Department of Water Affairs**

Project Title	Adapting to national and trans-boundary water resource management in Swaziland to manage expected climate change.			
Name of the Institution	Department of Water Affairs -- Ministry of Natural Resources and Energy			
Date of assessment	08-12-2010			
INDICATOR	AREAS ASSESSMENT	FOR	APPLICABLE DOCUMENTS/TOOLS	COMMENTS
PART I - REFERENCES AND PRELIMINARY CHECKS				
1.1 History and Compliance with International Resolutions/Standards				
1.1.1 History	<p>Date of creation and length in existence.</p> <p><b>Established by the act in 2009 but actual establishment was in 2008.</b></p> <p><b>Have hired a director</b></p> <p>Has the institution gone through a recent re-organization/re-structuring?</p> <p><b>Restructured last year under legal notice in 2009.</b></p> <p><b>Formally all the water agencies responsible were brought together. Legal notice 25: realignment of ministries and departments.</b></p>		<p>Annual Reports:</p> <p>Media Kit</p> <p>Website</p>	
1.1.2 United Nations Security Council 1267	Is the institution listed in any reference list?		United Nations Security Council 1267 Committee's list of terrorists and terrorist financiers	Too young to be listed.
1.1.3 Certification	<p>Is the institution already certified through international standards?</p> <p><b>Yes- laboratories are accredited and follow standards. (two labs – one monitoring water river systems, and another monitoring water supply)</b></p>		ISO, Project Management standard, other standards?	

<b>PART II. ASSESSING NATIONAL INSTITUTION CAPACITY FOR PROJECT MANAGEMENT</b>			
<b>2.1 Managerial Capacity</b>			
Ability to plan, monitor and coordinate activities			
Planning, Monitoring & Evaluation	<p>Does the institution produce clear, internally consistent proposals and intervention frameworks, including detailed workplans? <b>Yes. E.g. now doing their budget (want objectives etc).</b></p> <p><b>Have performance appraisals.</b> <b>(Ministers and PS are appraised on this.</b> <b>Regulated by office of the Prime Minster. Public policy coordination unit in the PM office.</b></p> <p>Does the institution hold regular programme or project review meetings? <b>Yes.</b></p> <p>Are there measurable outputs/deliverables in the defined project plans? <b>Yes.</b></p> <p>Was the institution previously exposed to UNDP RBM approach/methodology or equivalent in other donor agencies? <b>Yes. E.g. UNICEF and other agencies.</b></p>	<p>Well-designed project and programme documents <b>yes</b></p> <p>Action Plans/Work plans</p> <p>Log frame or equivalent</p> <p>Project reports <b>yes</b></p> <p>Evaluation reports <b>yes</b></p> <p>Indicators available in project plans <b>yes</b></p> <p>Lessons-Learned reports <b>yes</b></p>	
2.1.2 Reporting and performance track record	<p>Does the institution monitor progress against well defined indicator and targets, and evaluate its programme/project achievements? <b>Yes.</b></p> <p>Does the institution report to its stakeholders on a regular basis? <b>Yes. (NGOs, international partners, Chinese, UNICEF)</b></p>	<p>Reports to donors and other stakeholders <b>yes</b></p> <p>Reporting system <b>yes</b></p>	
<b>2.2 Technical Capacity</b>			
2.2.1 Specialization	<p>Does the institution have the technical skills required? <b>Not fully, for rural water supply they are short of</b></p>	<p>Publications on activities, specific issues, analytical articles, policies</p>	

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	<p><b>engineers, currently only have two on contract. Posts are not filled.</b></p> <p><b>Affects them most. Only technicians. Not enough money in government, most engineers go elsewhere.</b></p> <p><b>Process of filling a post is too bureaucratic takes 6 months minimum to fill posts. Also problem now with the lack of funds.</b></p> <p><b>They need to write to PM to advocate for posts now. Never got a hydrogeologist at all. Now got three geologists who they are training. (the civil service commission does the hiring).</b></p> <p>Does the institution have the knowledge needed?</p> <p><b>Yes pretty much. E.g. subscribing to journals etc. challenge with senior staff - Some training required.</b></p> <p>Does the institution keep informed about the latest techniques/competencies/policies/trends in its area of expertise?</p> <p><b>Keep up to date with journals and internet.</b></p> <p>Does the institution have the skills and competencies that complement those of UNDP?</p> <p><b>Yes and no...need more experience.</b></p>	<p>Reports from participation in international, regional, national or local meetings and conferences</p> <p>Tools and methodologies</p> <p>Evaluations and assessments</p> <p><b>Yes to all.</b></p>	
<p>2.2.2 Ability to monitor the technical aspects of the project.</p>	<p>Does the institution have access to relevant information/resources and experience?</p> <p><b>No.</b></p> <p>Does the institution have useful contacts and networks?</p>	<p>Evaluations and Assessments <b>yes</b></p> <p>Methodologies/training materials <b>yes</b></p> <p>Use of toolkits, indicators and benchmarks/capacity-development tools</p>	

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		<p><b>Yes, some contacts. But not enough.</b></p> <p>Does the institution know how to get baseline data, develop indicators?</p> <p><b>A bit of a challenge there.</b></p> <p>Does it apply effective approaches to reach its targets (i.e participatory methods)?</p> <p><b>Yes. They aim to do so.</b></p>	<p><b>Yes.</b></p> <p>Databases yes</p>	
2.2.3	Human Resources	<p>Does the institution staff possess adequate expertise and experience?</p> <p><b>Yes, but not all.</b></p> <p>Does the institution use local capacities (financial/human/other resources)?</p> <p><b>Mostly local. Even contractors are local.</b></p> <p>What is the institution capacity to coordinate between its main office and decentralized entities/branches (if relevant)?</p> <p><b>Communication is quite good. But even in town, it's difficult to get around (cars). But putting the departments all together soon.</b></p> <p>Have staff been trained on project management methodology?</p> <p><b>Yes, but still need some increased capacity on this.</b></p>	<p>Profile of staff, including expertise and professional experience</p> <p><b>Most senior staff has M.Sc. engineering level up to directors.</b></p> <p>Staff turnover</p> <p><b>Yes there is. Once get M.Sc. then people quit.</b></p> <p>Chart of assignments of roles and functions</p> <p>Reports on technical experience from national or international agencies for operations and capacity-building</p> <p>Individual certification on project management such as PRINCE2 No</p>	
<b>PART III. ASSESSING NATIONAL INSTITUTION CAPACITY FOR ADMINISTRATIVE AND FINANCIAL MANAGEMENT</b>				
<b>3.1 Administrative capacity</b>				
<i>Ability to provide adequate logistical support and infrastructure</i>				
3.1.1	Ability to	Does the institution possess	Adequate logistical	



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<p>manage and maintain infrastructure and equipment</p>	<p>logistical infrastructure and equipment?</p> <p><b>Yes...but mostly got enough. Have labs, have rigs, have got enough technical tools.</b></p> <p>Can the institution manage and maintain equipment?</p> <p><b>Mostly fine...some rigs are 25 years old and are still running.</b></p>	<p>infrastructure: office facilities and space, basic equipment, utilities yes</p> <p>Computer capability and library materials yes</p> <p>Proper equipment for area of specialization yes</p> <p>inventory to track property and cost</p> <p><b>yes, very strict.</b></p>	
<p>3.1.2 Ability to procure goods services and works on a transparent and competitive basis.</p>	<p>Does the institution have the ability to procure goods, services and works on a transparent and competitive basis?</p> <p><b>Yes. Have a procurement committee.</b></p> <p>Does the institution have standard contracts or access to legal counsel to ensure that contracts meet performance standards, protect UNDP and the institution's interests and are enforceable?</p> <p><b>Yes.</b></p> <p>Does the institution have the authority to enter into contracts?</p> <p><b>Yes. (still use the national tender process). A very long process.</b></p> <p><b>There is a tender waiver for less than 500 000. Bu then need to look for three quotations.</b></p>	<p>Standard contracts yes.</p> <p><b>Examples of how procurement is done through the procurement committee and the PS has his own committee that checks on this.</b></p> <p>Written procedures for identifying the appropriate vendor, obtaining the best price, and issuing commitments</p>	
<p>3.1.3 Ability to recruit and manage the best-qualified personnel on a transparent and competitive basis.</p>	<p>Is the institution able to staff the project and enter into contract with personnel?</p> <p><b>Problem – still stretched. Have to have a post to hire someone. Cannot create a</b></p>	<p>Standard contracts</p> <p>Job descriptions</p> <p><b>Yes.</b></p>	

	<p>post for a project but could assign a project manager through secondment. But there would be a potential capacity problem.</p> <p>Does the institution use written job descriptions for consultants or experts?</p> <p>Normal procurement process...put out a TOR. Also a lengthy process. They tend to put the team in a hotel for a week to score all the people.</p>		
<p><b>3.2 Financial Capacity</b>  <i>Ability to ensure appropriate management of funds</i>          In addition to the following questions, see also the questionnaire provided in the Guidelines on Micro-assessment of the Framework on Harmonized Approach for Cash Transfer (HACT):  <a href="http://www.undg.org/archive_docs/7110-Framework_for_Cash_Transfers_to_Implementing_Partners.doc">http://www.undg.org/archive_docs/7110-Framework_for_Cash_Transfers_to_Implementing_Partners.doc</a>  <b>(ANNEX 3)</b>          The assessment report is reviewed by the UN agencies to select the most suitable cash transfer modality, and establish appropriate cash transfer procedures and assurance activities to be used with the Implementing Partner.</p>			
<p>3.2.1 Financial management and funding resources</p>	<p>Is there a regular budget cycle? yes</p> <p>Does the institution produce programme and project budgets? yes</p> <p>What is the maximum amount of money the institution has managed? e.g. 35 million Rand water supply project.</p> <p>Does the institution ensure physical security of advances, cash and records?</p> <p>Normally have a principal accountant and then a controlling officer and then accountant general who look after the money. And have auditors. Monitor that money is used for its purpose.</p> <p>Does the institution disburse funds in a timely and</p>	<p>Operating budgets and financial reports yes</p> <p>List of core and non-core donors and years of funding</p> <p><b>JICA (brought in a rig); CIDA for a few years; UNDP; UNICEF; International cooperation partners; EU; ADB; Italian government.</b></p> <p>Written procedures ensuring clear records for payable, receivables, stock and inventory yes</p> <p>Reporting system that tracks all commitments and expenditures against budgets by line - yes</p>	

	<p>effective manner?</p> <p>As far as possible, but have very stringent procurements. Ask every quarter what is spent. Report to parliament, and then to auditor general – PS is accountable. Within 10%.</p> <p>Does the institution have procedures on authority, responsibility, monitoring and accountability of handling funds?</p> <p>Yes,</p> <p>Does the institution have a record of financial stability and reliability?</p> <p>Yes. Theoretically there should be no over spending at all.</p>		
3.2.2. Accounting System	<p>Does the institution keep good, accurate and informative accounts?</p> <p>yes</p> <p>Does the institution have the ability to ensure proper financial recording and reporting?</p> <p>Yes</p>	<p>A bank account or bank statements</p> <p>No. all money is controlled by treasury or ministry of finance.</p> <p>Audited financial statements</p> <p>No.</p> <p>Good, accurate and informative accounting system</p> <p>Yes</p> <p>Written procedures for processing payments to control the risks through segregation of duties, and transaction recording and reporting</p> <p>There are restrictions when requisitioning money.</p>	
3.2.3. Knowledge of UNDP financial system	<p>Does the institution have staff familiar with Atlas through External Access?</p> <p>No. e.g. ADB – they get someone in ministry of planning and finance who would assist on this front.</p>	<p>External access provided</p> <p>No.</p>	

**Capacity Assessment: Ministry of Agriculture**

Project Title	Adapting to national and trans-boundary water resource management in Swaziland to manage expected climate change.			
Name of the Institution	Ministry of Agriculture			
Date of assessment	19-12-2010			
INDICATOR	ARTAS ASSESSMENT	FOR	APPLICABLE DOCUMENTS/TOOLS	COMMENTS
PART I – REFERENCES AND PRELIMINARY CHECKS				
1.1 History and Compliance with International Resolutions/Standards				
1.1.1 History	<p>Date of creation and length in existence.</p> <p><b>Established before independence (before 1968) and has several departments that could be of interest in the present project</b></p> <p>Has the institution gone through a recent re-organization/re-structuring?  <b>No major recent restructuring. Most recent has been the transfer of the Forestry unit to the Ministry of Tourism and Environmental Affairs as part of the Legal notice 25: realignment of ministries and departments.</b></p>		<p>Annual Reports:</p> <p>Media Kit</p> <p>Website</p>	
1.1.2 United Nations Security Council 1267	Is the institution listed in any reference list?		United Nations Security Council 1267 Committee's list of terrorists and terrorist financiers	<b>Not listed according to our knowledge.</b>
1.1.3 Certification	<p>Is the institution already certified through international standards?</p> <p><b>Yes – evident in access to EU markets of the nation's beef products. Same with National Agricultural Marketing Board (NAMBOARD) which received international farming standards, and by Swaziland Standards</b></p>		ISO, Project Management standard, other standards?	

	Authority (SWASA).		
<b>PART II. ASSESSING NATIONAL INSTITUTION CAPACITY FOR PROJECT MANAGEMENT</b>			
<b>2.1 Managerial Capacity</b>			
Ability to plan, monitor and coordinate activities			
Planning, Monitoring & Evaluation	<p>Does the institution produce clear, internally consistent proposals and intervention frameworks, including detailed workplans? <b>Yes. Have performance appraisals.</b></p> <p>Does the institution hold regular programme or project review meetings? <b>Yes.</b></p> <p>Are there measurable outputs/deliverables in the defined project plans? <b>Yes.</b></p> <p>Was the institution previously exposed to UNDP RBM approach/methodology or equivalent in other donor agencies? <b>Yes. E.g. UNCCD project.</b></p>	<p>Well-designed project and programme documents <b>yes</b></p> <p>Action Plans/Work plans Log frame or equivalent Project reports <b>yes</b></p> <p>Evaluation reports <b>yes</b> Indicators available in project plans <b>yes</b></p> <p>Lessons-Learned reports <b>yes</b></p>	
2.1.2 Reporting and performance track record	<p>Does the institution monitor progress against well defined indicator and targets, and evaluate its programme/project achievements? <b>Yes.</b></p> <p>Does the institution report to its stakeholders on a regular basis? <b>Yes. (EU, IFAD, FAO funded projects)</b></p>	<p>Reports to donors and other stakeholders <b>yes</b></p> <p>Reporting system <b>yes</b></p>	
<b>2.2 Technical Capacity</b>			
2.2.1 Specialization	<p>Does the institution have the technical skills required? <b>Technical Skills generally okay. Other areas of capacity may be a constraint such as resources for maintenance of equipment and plant.</b></p> <p>Does the institution have the knowledge needed?</p>	<p>Publications on activities, specific issues, analytical articles, policies</p> <p>Reports from participation in international, regional, national or local meetings and conferences</p> <p>Tools and methodologies</p> <p>Evaluations and assessments</p>	

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	<p><b>Yes pretty much.</b></p> <p>Does the institution keep informed about the latest techniques/competencies/policies/trends in its area of expertise?</p> <p><b>Generally kept up-to-date. Internet and other information sources can be consulted if additional information is required.</b></p> <p>Does the institution have the skills and competencies that complement those of UNDP?</p> <p><b>Yes.</b></p>	<p><b>Yes to all.</b></p>	
2.2.2 Ability to monitor the technical aspects of the project.	<p>Does the institution have access to relevant information/resources and experience?</p> <p><b>Generally yes.</b></p> <p>Does the institution have useful contacts and networks?</p> <p><b>Yes, some contacts.</b></p> <p>Does the institution know how to get baseline data, develop indicators?</p> <p><b>Yes. But there is room for improvement in this area.</b></p> <p>Does it apply effective approaches to reach its targets (i.e participatory methods)?</p> <p><b>Yes. They aim to do so.</b></p>	<p>Evaluations and Assessments <b>yes</b></p> <p>Methodologies/training materials <b>yes</b></p> <p>Use of toolkits, indicators and benchmarks/capacity-development tools <b>Yes.</b></p> <p>Databases <b>Yes, but there is room for improvement such as having up-to-date information.</b></p>	
2.2.3 Human Resources	<p>Does the institution staff possess adequate expertise and experience?</p> <p><b>Yes, but not all.</b></p> <p>Does the institution use local capacities</p>	<p>Profile of staff, including expertise and professional experience</p> <p><b>Most senior staff have M.Sc. engineering level up to directors. A few have doctorate level</b></p>	

	<p>(financial/human/other resources)?</p> <p><b>Mostly local.</b></p> <p>What is the institution capacity to coordinate between its main office and decentralized entities/branches (if relevant)?</p> <p><b>Communication is generally quite good. The institution is used to working with dispersed teams.</b></p> <p>Have staff been trained on project management methodology?</p> <p><b>Some have. But there is need for increase in capacity in this area.</b></p>	<p><b>qualification.</b></p> <p>Staff turnover</p> <p><b>Yes there is. But it is not major.</b></p> <p>Chart of assignments of roles and functions</p> <p>Reports on technical experience from national or international agencies for operations and capacity-building</p> <p>Individual certification on project management such as PRINCE2 No</p>	
<b>PART III. ASSESSING NATIONAL INSTITUTION CAPACITY FOR ADMINISTRATIVE AND FINANCIAL MANAGEMENT</b>			
<b>3.1 Administrative capacity</b>			
<i>Ability to provide adequate logistical support and infrastructure</i>			
3.1.1 Ability to manage and maintain infrastructure and equipment	<p>Does the institution possess logistical infrastructure and equipment?</p> <p><b>Yes.</b></p> <p>Can the institution manage and maintain equipment?</p> <p><b>Yes. However, government funds tend to be the limiting factor in keeping the equipment and plant in good working condition always.</b></p>	<p>Adequate logistical infrastructure: office facilities and space, basic equipment, utilities <b>yes</b></p> <p>Computer capability and library materials <b>yes</b></p> <p>Proper equipment for area of specialization <b>yes</b></p> <p>inventory to track property and cost <b>yes.</b></p>	
3.1.2 Ability to procure goods services and works on a transparent and competitive basis.	<p>Does the institution have the ability to procure goods, services and works on a transparent and competitive basis?</p> <p><b>Yes. Local teams initiate the process, and recommend to Central Tender Board.</b></p>	<p>Standard contracts <b>yes.</b></p> <p><b>Yes. Central Tender Board set the standards</b></p> <p>Written procedures for identifying the appropriate vendor, obtaining the best price, and issuing commitments</p>	

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	<p>Does the institution have standard contracts or access to legal counsel to ensure that contracts meet performance standards, protect UNDP and the institution's interests and are enforceable?</p> <p><b>Yes. Central Tender Board has strict but transparent standard contracts.</b></p> <p>Does the institution have the authority to enter into contracts?</p> <p><b>Yes, through the Central Tender Board for big contracts. There is a tender waiver for less than 500 000. But then need to look for three quotations which are cleared by the Central Tender Board.</b></p>		
<p>3.1.3 Ability to recruit and manage the best-qualified personnel on a transparent and competitive basis.</p>	<p>Is the institution able to staff the project and enter into contract with personnel?</p> <p><b>Capacity is generally available for day-to-day programme. Project might add some pressure through.</b></p> <p>Does the institution use written job descriptions for consultants or experts?</p> <p><b>Terms of reference highlight the tasks that need to be delivered by the consultant. The qualification, skills and required competencies are also clearly stated. Selection is based on these in a transparent process.</b></p>	<p>Standard contracts Job descriptions <b>Yes.</b></p>	



### 3.2 Financial Capacity

*Ability to ensure appropriate management of funds*

In addition to the following questions, see also the questionnaire provided in the Guidelines on Micro-assessment of the Framework on Harmonized Approach for Cash Transfer (HACT):

[http://www.undg.org/archive\\_docs/7110-Framework\\_for\\_Cash\\_Transfers\\_to\\_Implementing\\_Partners.doc](http://www.undg.org/archive_docs/7110-Framework_for_Cash_Transfers_to_Implementing_Partners.doc)  
(ANNEX 3)

The assessment report is reviewed by the UN agencies to select the most suitable cash transfer modality, and establish appropriate cash transfer procedures and assurance activities to be used with the Implementing Partner.

3.2.1 Financial management and funding resources	Is there a regular budget cycle? <b>yes</b>	Operating budgets and financial reports <b>yes</b>
	Does the institution produce programme and project budgets? <b>yes</b>	List of core and non-core donors and years of funding
	What is the maximum amount of money the institution has managed? <b>e.g. Over 50 million Emalangeni dams project.</b>	<b>IFAD, FAO, EU, GEF, Chinese-Taiwan.</b>
	Does the institution ensure physical security of advances, cash and records?	Written procedures ensuring clear records for payable, receivables, stock and inventory <b>yes</b>
	<b>Normally have a principal accountant and then a controlling officer and then accountant general who look after the money. And have auditors. Monitor that money is used for its purpose.</b>	Reporting system that tracks all commitments and expenditures against budgets by line - <b>yes</b>
	Does the institution disburse funds in a timely and effective manner?	
	<b>Generally yes. But Government funding is released quarterly, which tends to restrict implementation as lump sum may be required at a go. However, for capital projects the project officer will indicate the quarter in which he/she requires the money.</b>	
	Does the institution have procedures on authority, responsibility, monitoring and accountability of	

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	<p>handling funds?  <b>Yes,</b></p> <p>Does the institution have a record of financial stability and reliability?</p> <p><b>Yes. Theoretically there should be no over spending at all as the Government computer system controls this.</b></p>		
<p>3.2.2. Accounting System</p>	<p>Does the institution keep good, accurate and informative accounts?  <b>Yes</b></p> <p>Does the institution have the ability to ensure proper financial recording and reporting?  <b>Yes</b></p>	<p>A bank account or bank statements</p> <p><b>All money is controlled by treasury or ministry of finance.</b></p> <p><b>However, some special projects accounts are opened from time to time, depending on the donor's requirement.</b></p> <p><b>Ministry is experienced in working with different arrangements:</b></p> <ul style="list-style-type: none"> <li>- Money fully transferred to Government</li> <li>- Money kept with Donor, direct payments</li> <li>- Money transferred into specially created project account by Government</li> </ul> <p>Audited financial statements</p> <p><b>No.</b></p> <p>Good, accurate and informative accounting system</p> <p><b>Yes</b></p> <p>Written procedures for processing payments to control the risks through segregation of duties, and transaction recording and reporting</p> <p><b>There are restrictions</b></p>	

		when requisitioning money.	
3.2.3. Knowledge of UNDP financial system	Does the institution have staff familiar with Atlas through External Access?  Not certain. Assistance may be required.	External access provided No.	

**Annex 5. Minutes of stakeholder consultations held during the PPG Phase**

The minutes of the following meetings are included in this Annex:

Meetings facilitated by Mr. Dumisani Mndzebele (National Consultant, NC):

1. Meeting with Mr. Trevor Shongwe, Chief Water Engineer, DWA, MNRE, 15 October 2010.
2. Meeting with Mr. Peterson Dlamini, Senior Energy Officer, Department of Energy Affairs (DEA), MNRE, 18 October 2010.
3. Meeting with Dr. Mxolisi Shongwe, National coordinator, National Climate Change Committee (NCCC), 18 October 2010.
4. Meeting with Prof Jonathan Matondo, University of Swaziland, 28 October 2010.
5. Meeting with Dr. Lukhele, Chief Executive Officer, SWADE, 3 November 2010.
6. Meeting with Mr. Emanuel Dlamini, Director, National Meteorological Services, MTE, 8 November 2010.
7. Meeting with Mr. Seth Maphalala, Chairman Renewable Energy Association of Swaziland (REAS), 9 November 2010.
8. Meeting with Mr. James Vilakati, Executive Director, Swaziland Environment Authority (SEA), MTE, 9 November 2010.

Meetings facilitated by Mr. Dumisani Mndzebele (NC) and Ms. Sarah Fox (International Consultant):

9. Meeting with Dr. Mxolisi Shongwe, National coordinator, NCCC, 06 December 2010.
10. Meeting with representatives of the SWADE, LUSIP project, 06 December 2010.
11. Meeting with Mr. Obed Ngwenya, Director, DWA, MNRE, 08 December 2010.
12. Meeting with Mandisa Zwane-Machakata, UNDP HIV/AIDS programme Unit, 8 December 2010
13. Meeting with Joseph Mutsigwa, UNDP Disaster Risk Reduction (DRR) programme Unit, 8 December 2010.
14. Meeting with Mr. Nsindiso Dlamini, SWADE, KDDP project, 13 December 2010.
15. Meeting with Dr. Leonard Ndlovu, Swaziland Royal Sugar Corporation, 13 December 2010.
16. Meeting with Mrs. Lynne Kota, Environment Manager, SWADE, 14 December 2010.

Meetings facilitated by Mr. Dumisani Mndzebele (NC):

17. Meeting with Mr. Bongani Masuku, Under-Secretary, MOA, 18 December 2010.
18. Meeting with Ms. Futhi Magagula, Forestry Officer, Forestry Department, MTE, 20 December 2010
19. Meeting with Mr. Bongani Magongo and Mr. Khoza Mathokoza, officers, Land Development Section, MOA, 21 December 2010.

**1. Meeting with Mr. Trevor Shongwe, Chief Water Engineer, DWA, MNRE, 15 October 2010**

**1. Background and duty station**

The purpose of the meeting was to establish the background of the project in as far as the DWA was concerned considering that the project was anchored around water sector activities. Mr. Shongwe explained that the project had a long historic background, highlighting the need for integrating climate change adaptation to ongoing initiatives such as the LUSIP. He stressed that the project was one of the components of the climate change adaptation interventions under the centralized Government coordination in the country.

The NC also indicated that he had been advised by the UNDP Country Office that he would be operating from the DWA office and wanted to know how ready the office was in relation to arrangements. It was decided that this matter would be considered further when the project officer/manager within DWA (Mr. Sakhiwe Nkomo) was back to confirm the state of those arrangements.

**2. Major ongoing work**

Mr. Shongwe highlighted the following major initiatives:

**a. Finalization of the NWP**

Work was ongoing and the policy was being finalized. Among the many aspects taken into consideration in the review was ensuring a focus on climate change adaptation. The NC was given a copy of the present draft document.

**b. Mkhondvo (Ethemba) Dam Project**

A feasibility study had recently been completed. It was not very certain if hydrological models had factored climate change impacts and hence consideration of climate change would have to be evaluated. If not adequate this could be recommended for the general review of hydrology that tends to take place at project design stage. A nationwide basin-hydrology review taking climate change into account was also considered. It was noted that KOBWA had done some work for the Komati/Lomati Basin in this regard and the NC would follow-up on the feasibility report.

**c. Nondvo Dam Project**

Swaziland is planning a dam below Lumphohlo Dam to augment water supply to Mbabane and Manzini cities. This project was at a conceptual stage and not much documented information was available. The project was currently reviewing the Joint Maputo Study Reports.

**d. Rural water supply in the Shiselweni Region**

A study had been initiated, funded by the AfDB, to determine the most technical, economic, environmental and socially acceptable options for upgrading the water supply and sanitation services to the rural Lavumisa-Matsanjeni-Nsalitje Corridor. The study will produce detailed engineering designs, cost estimates, and tender documents for the implementation of the construction works for the least costly option. The NC received a copy of the terms of reference (in the form of a bidding document).

**e. PRIMA Projects (joint projects between Swaziland, Mozambique & South Africa)**

Two of the many components of the above project were considered very relevant for the climate change adaptation project. These were the: i) disaster management strategy; and ii) System Operating Rules. These may have to be evaluated for responsiveness to climate change impacts. The overlap in implementation period may be important if the national climate change project is to contribute or inform PRIMA initiatives.

**f. Joint Umbeluzi River Basin study**

A joint water resources study between Mozambique and Swaziland in the trans-boundary Umbeluzi River Basin was completed some time ago. It may, however, need to be evaluated for adequacy of consideration of climate change impacts to the hydrological regime.

**g. Flood management in Pongola System**

Some work was ongoing in this basin in relation to facilitation of climate change adaptation. The NC will consult SWADE for further details.

**3. Understanding of climate change and risks in the water sector**

This was rated as 'low' and potentially indicates the need for raised climate change awareness.

**4. Consideration of climate change in water sector projects**

This was generally rated as 'low'.

**5. Institutional capacity to cope with climate change risks**

This was rated as 'low', as the RBAs which were seen as key players in climate change adaptation at a basin level are still very young and need capacity development.

**6. Potential co-financing opportunities**

There is an opportunity to co-finance using capital project funds. The challenge arises in the uncertainty of whether the Government will provide funding for the proposed projects.

**2. Meeting with Mr. Peterson Dlamini, Senior Energy Officer, Department of Energy Affairs (DEA), MNRE, 18 October 2010**

**1. Background and duty station**

The purpose of the meeting was to understand the initiatives of the energy sector that depended on water, as they could be impacted by the climate change. Below is a brief description of some ongoing projects in the energy sector that were highlighted by Mr. Dlamini.

**2. Major ongoing work**

**a. Thermal power station**

A coal fired power station has been planned in the Lowveld region at the Lubhuku area. The project was at a feasibility study stage and water demands were not yet known.

**b. Lower Maguduza Power Plant**

A new hydropower plant (including dam construction) is planned in the Great Usuthu River. A feasibility study had been completed and the project was awaiting funding. It seemed most likely that the thermal power plant had received priority over this project for water assurance reasons.

**c. Ngwempisi Hydropower Plant**

Some viable sites for a mini-hydropower plant in lower Ngwempisi River had been identified in earlier studies and the DEA was already working towards a fully-fledged feasibility study. Phased

project implementation was considered, but the current target was to total approximately 120 MW at full implementation.

**d. Mnjoli micro-hydro power scheme**

Designs for a small scale power plant at Mnjoli were underway to take advantage of the dam wall raising. The DEA was considering involving the downstream sugar company, Simunye, in the implementation of the project and as a potential user of the generated energy.

**3. Understanding of climate change and risks in the energy sector**

This was rated as 'average'.

**4. Consideration of climate in water related energy projects**

This was rated as 'above average' as thermal power was prioritized as compared to Maguduza due to fact that thermal power requires less water and therefore provides a higher level of assurance.

**5. Institutional capacity to cope with climate change risks**

This was rated 'high'. The sector, especially Swaziland Energy Company, was generally technically empowered to forecast impacts and recommend alternatives.

**6. Potential co-financing opportunities**

Dependence on Government funding and budget cycle created uncertainty on the timing of the availability of counterpart funding. There was, however, a desire for such funding.

**3. Meeting with Dr. Mxolisi Shongwe, National coordinator, National Climate Change Committee (NCCC), 18 October 2010.**

**1. Background**

The purpose of the meeting was to establish: i) the main initiatives on climate change adaptation in the country; ii) who the key stakeholders were; and iii) how the NCCC was approaching such matters. The NC also wanted to know what the main role of the NCCC was in relation to climate change in Swaziland. Dr. Shongwe explained that the major roles were: i) the coordination of all stakeholders' activities; ii) developing related coordination strategies; and iii) mobilizing funding for climate change adaptation in the country, amongst others activities. Below is a brief description of some of the ongoing initiatives by the NCCC that were highlighted by Dr Shongwe.

**2. Major ongoing work**

**a. Vulnerability assessment**

A vulnerability assessment was underway and a consultant was preparing the report. The water sector's was being informed by the work of Prof Matondo, Mark Tadross, Kwabena Asante and Dr Mxolisi Shongwe, amongst others. Some of the reports were shared with the NC. The vulnerability assessment will lead to the creation of a national climate change adaptation strategy in the near future.

**b. National dialogue (Indaba) on climate change**

The NCCC was considering a national dialogue on climate change. This was largely aimed at raising awareness on climate change and the related impacts. The dialogue had initially been scheduled for mid-October 2010, but has since been postponed. .

**c. Other developments in different sectors**

Dr. Shongwe noted that there were a number of initiatives in the various sectors in the country that could be linked to climate change adaptation, some of which related to the water sector. These related to numerous things such as policies, strategies, legislative and institutional reforms and physical interventions. Sectoral contact points had been established across the country to periodically update the NCCC on developments and initiatives from the different sectors.

**3. Understanding of climate change and risks in the country**

This was rated as 'low', hence the initiative to improve awareness in the country.

**4. Consideration of climate change in water related initiatives**

This was difficult to rate until full coordination of the water sector's activities and those of others is known. However, generally speaking, the gap has been realized, hence the initiatives on UNDP/GEF climate change adaptation project. The rating would thus be 'low to average'.

**5. Institutional capacity to cope with climate change risks**

This was rated as 'low to average'.

**6. Other matters**

In general the National Coordinator recommended a spontaneous adaptation strategy as compared to an anticipatory approach to climate change adaptation. This may lead to relying on more observations rather than projections. In relation to stakeholder consideration for workshops, the NC was also encouraged to take into consideration the representation of irrigators and groundwater dependent communities. In conclusion, the NC requested the continued support in the implementation of the project.

**4. Meeting with Prof Jonathan Matondo, University of Swaziland, 28 October 2010.**

**1. Background and duty station**

The purpose of the meeting was to understand Prof Matondo's experience on climate change impact predictions in Swaziland, and his previous collaboration with Dr. Msibi.

**2. Major recent work**

Prof Matondo explained that there had been more recent work done in the country. In a recent study, four catchments had been considered, the Usutu, Komati, Mbuluzi and Ngwavuma. Using General Circulation Models, future runoff was generated using the Watbal rainfall-runoff model for the period 2021 – 2060. This was compared with present stream-flow. The results show that for three of the river basins, i.e. the Mbuluzi, Usuthu and Ngwavuma, there will be lower flows than at present for dry winter months. However, the Komati will have higher future flows.

It is worth noting that the decreases and increase of the stream flows in the catchments fail to attain statistical significance at the 5% level<sup>148</sup>. It has also been established that the present stream-flow still lies within the 95% confidence interval of the projected flows in all the catchments which emphasizes the lack of statistical significance in the simulated runoff change. The paper concluded therefore that, the water resources in Swaziland are not vulnerable to climate change at the 5% significance level.

<sup>148</sup>Please note that this point is debatable due to the lack of information regarding climate change impacts on Swaziland's water sector at present – which is something the project aims to improve.

The paper also proposed some adaptation strategies for Swaziland such as efficient water use, strengthening early warning centres, implementation of IWRM and rainwater harvesting. The NC kept a copy of the paper.

### **3. Understanding of climate change and risks**

This was rated as 'average' as a result of awareness initiatives in recent years. The country clearly needs to invest in adaptation strategies around the development of water infrastructure while also implementing the other forms of proposed adaptation strategies. Conclusions from other desk top work reflected that indeed the country, like other sub-Saharan Africa countries (540 m<sup>3</sup>/capita as compared to the world average of 960 m<sup>3</sup>/capita), has very little storage/capita. This was one argument raised by Prof. Matondo on the consideration of infrastructure as one of the means for adaptation in Swaziland.

## **5. Meeting with Dr. Lukhele, Chief Executive Officer, SWADE, 3 November 2010**

### **1. Background**

The purpose of the meeting was to establish the major ongoing work, understand the climate change risks, the consideration of climate in projects and the institutional capacity to cope or adapt to climate change challenges.

### **2. Major ongoing work**

Mr. Lukhele highlighted that irrigation in the country could be seen as an adaptation response to climate change, as community water supply is often threatened by prolonged droughts due to climate change impacts. SWADE has started to devise interventions of irrigated agriculture and other strategies to attempt to address water needs. This necessitates a change in the traditional community water source approach to a more business-oriented outlook on water use.

#### **a. KDDP & LUSIP**

Mr. Lukhele highlighted the work that SWADE is doing in the Komati Basin as well as the Lower Lusutfu Basin. The water supply from these interventions provides high water assurance to the beneficiary communities. The NC requested the documents on these two initiatives, and was referred to the two Project offices (Mike Hill/Musa Matsebula-LUSIP, and Moses Vilakati-KDDP).

#### **b. Lavumisa area as a water supply source**

SWADE has been involved in a study investigating the transfer of water from the Jozini Dam, Lavumisa area, South Africa, to irrigate two areas identified land in Swaziland. From a trans-boundary climate change adaptation point of view, this was seen as an opportunity to mitigate the flood impacts that occur downstream of Mozambique from flood releases from the Pongola reservoir. Unfortunately, feasibility studies have shown this to be a non-viable project due to the related economics of pumping water to the target areas. Other avenues were still being explored by SWADE consultants, including the Ngwavuma River as a source.

#### **c. Mkhondvo Dam**

Mr. Lukhele noted that the DWA had just concluded a feasibility study for a dam in the Mkhondvo River, an initiative that could also be seen within the framework of climate change adaptation for the irrigation sector. Further consideration of this work could be required.



**3. Understanding of climate change and risks in the country**

This was rated as 'low'.

**4. Consideration of climate change in initiatives**

This was rated as 'low'.

**5. Institutional capacity to cope with climate change risks**

SWADE has very good potential for awareness raising and education of beneficiary communities once clear messages are defined. The institutional structure is fully functional and knowledge and technical skills should now be addressed.

The level of effective adaptation of farmers could be rated as 'low' in the short-term as they still need loans. For instance, the farmers are presently linked to the sugar crop which has a firm market. But ideally in the long-term, they will be loan-free and this could enable a diversification of crops, including drought-tolerant crops. This would qualify as an adaptation strategy.

**6. Meeting with Mr. Emanuel Dlamini, Director, National Meteorological Services, MTE, 8 November 2010.**

**1. Background**

The purpose of the meeting was to establish the major ongoing work, understand the climate change risks, the consideration of climate in projects and the institutional capacity to cope or adapt to climate change challenges.

**2. Major ongoing work**

**a. Climate change impact on the country's river basins**

The Director highlighted that there has been a recent study on the Lusutfu Basin, which was followed by more work in some other river basins (Komati, Mbuluzi and Ngwavuma), to try and understand the impact of climate change on the hydrological regimes of these basins.

**b. Harmonization of datasets**

Mr. Dlamini noted that incompatible datasets were a limiting factor in producing effective analyses of available information to better understand the impacts and forecasts. This was more of a problem for the hydrological and meteorological datasets and therefore data quality is a crucial factor. In response to this he was considering new database systems to assist the meteorological sector.

**3. Understanding of climate change and risks in the country**

This was rated as 'low'. The NC specifically highlighted that strategies being considered could not be necessarily classified as adaptation strategies in the context of the convention on climate change as they did not intend to reduce the emissions.

In Swaziland there is a serious need to isolate response impacts to water and the environment which are from actual climate change impacts from those related to malpractice, general population growth, industrialization and urbanization. Poor land use practices in the country also needed to be considered. He felt that what was being labelled as a climate change adaptation was in fact an adaptation to non-

climate change impacts. It is therefore essential that proper education on defining climate change and its adaptation strategies is available.

#### **4. Consideration of climate change in initiatives**

This was rated as 'low' largely due to poor understanding.

#### **5. Institutional capacity of institutions to cope with climate change risks**

This was rated as 'low'.

#### **6. Proposed interventions**

- a. Proper land use planning;
- b. Harmonization of data systems;
- c. Establishment of platforms for awareness raising; and
- d. Mitigation and vulnerability assessments.

#### **7. Meeting with Mr. Seth Maphalala, Chairman Renewable Energy Association of Swaziland (REASWA), 9 November 2010.**

##### **1. Background**

The purpose of the meeting was to establish the areas of involvement of REASWA and Swaziland National Trust Commission on climate change adaptation in the country.

##### **2. Major ongoing work**

###### **a. Rural community water supply project**

Speaking for REASWA, Mr. Maphalala noted that there had not been much done to effectively mainstream climate change adaptation and response in the energy sector. However the association had recently been implementing an EU funded project on water supply seeking to find energy efficient solutions to rural community water supply. They were working with the Lutheran Development Services and ACAT-Lilima. There were particular impacts of climate change that the project was responding to, as some of the communities did not have water scarcity issues in the past, but over time there had been impacts which the project had to respond to. It was agreed that the NC would visit the REASWA office to establish whether or not some of the project sites could be considered for a climate change project.

###### **b. Education Programme on energy efficient systems**

REASWA is involved in an education programme, presently featured in the Lubombo region, on clean and renewable energy that does not impact heavily on the environment.

###### **c. Trans-frontier conservation work**

Speaking for the Swaziland National Trust Commission, Mr. Maphalala highlighted the involvement in the country's trans-frontier conservation work between Swaziland and her neighbours (South Africa and Mozambique). The Nsubane-Pongola trans-frontier conservation area was already operational, while three more were in the pipeline. From a climate change adaptation point of view these are seen as an opportunity to enable free migration of the animals as they adapt from one habitat to another. What was interesting is that the trans-frontier conservation areas concept is built around shared water bodies in the Pongola, Lusutfu, Mbuluzi and Komati River Basins.

### **3. Understanding of climate change and risks in the country**

The understanding of climate change impacts is still relatively 'low'. There is serious need for increased awareness as communities still do not relate the diminishing water sources and lowered groundwater tables to climate change. Before a change of attitude can be realized, awareness-raising is required.

### **4. Consideration of climate change in initiatives**

While scientific understanding is relatively low within the country, there is undeniable evidence of climate change-related impacts in the conservation sector. There have been changes in habitats that have been attributed to climate change. At times there has been a need for negotiations for migratory paths/track between adjacent conservations to enable the game to travel to new water sources because of diminished traditional watering points. The general challenge is the responsive nature of the sector, in that any slight change to the ecosystem triggers a series of changes. Drastic weather changes have a bearing on the reproduction (number of stocks) and sometimes the gender of certain species.

### **5. Institutional capacity to cope with climate change risks**

This was rated as 'low'. There is a need for energy audits and the availability of technical skills is a limitation. REASWA often depends on volunteer work for some of its tasks due to capacity gaps.

### **8. Meeting with Mr. James Vilakati, Executive Director, Swaziland Environment Authority (SEA), MTE, 9 November 2010.**

#### **1. Background**

The purpose of the meeting was to establish the major ongoing work, understand the climate change risks, the consideration of climate in projects and the institutional capacity to cope or adapt to climate change challenges.

#### **2. Major ongoing work**

Mr. Vilakati noted that there were no direct projects or activities within the sector yet. This was largely due to their regulatory nature. He nevertheless highlighted a few national initiatives which indicate that the country does realize the impacts of climate change, whether with full awareness or little understanding.

##### **a. Earth dam constructions**

Mr. Vilakati noted that the introduction of small earth dams by the agricultural sector was in essence an effort to adapt to the challenges of climate change other than general resource use pressures.

##### **b. Disaster management interventions**

The establishment of the NDMA is also partly evidence of the country's appreciation of the impacts of climate change. He lamented the fact that the approach taken had created a dependency syndrome in that people end up neglecting farming and depend on Government food hand-outs.

### **3. Understanding of climate change and risks in the country**

Mr. Vilakati noted that climate change is a reality so the country needs to ready itself for effective adaptation to climate change related challenges. He explained that there was more than enough evidence of climate change impacts such as land degradation, decline of river levels and receding of the groundwater table. He noted, however, that there was a lack of available research in the country to

effectively understand the extent and impacts of climate change. He noted the need for intensive and consistent public awareness and dissemination of information on climate change in the country.

#### **4. Consideration of climate change in initiatives**

This was rated as 'low', largely due to lack of awareness. The GEF funding available for Swaziland is generally not used, largely due to the lack of awareness. Mr. Vilakati highlighted, as an example, that out of US\$ 3.2 million that was available under the GEF for arrangement (support), Swaziland could only make use of approximately US\$ 800,000.

#### **5. Institutional capacity to cope with climate change risks**

This was rated as 'low'. Mr. Vilakati wished for strengthening of the research sector and early warning units. The need for advancement of the agricultural research was also emphasized.

#### **6. Other issues**

- a. Mr. Vilakati highlighted that the NGOs are not taking advantage of GEF funding opportunities (small grants) aimed at supporting NGOs to work with communities in dealing with the challenges of climate change, land degradation and biodiversity loss.
- b. He emphasized the need for climate change adaptation for Swaziland as a priority to help direct and coordinate the climate change interventions by different sectors in the country. He highlighted that at present the intended approach to climate change was not clear (i.e. should the focus be on mitigation or adaptation?).
- c. He recommended the introduction of pilot initiatives to be used to practically upscale awareness.
- d. He emphasized the need for deliberate programmes for dealing with the challenges of climate change in the country.
- e. He stressed the importance of catchment management, highlighting that the downstream major water users such as the sugar irrigation sectors need to start investing in the upstream catchment management initiatives.

#### **9. Meeting with Dr. Mxolisi Shongwe, National Coordinator, NCCC, 06 December 2010.**

The following points were noted at the meeting:

1. The NCCC is relatively new, having started in June 2010, with one water representative. The role of this water representative is to seek advice from key people from the water sector on the country's water issues and draft a position paper to put forward to the NCCC.
2. There are currently some political challenges, but these should be resolved shortly. Once the political challenges are resolved the NCCC should run efficiently as there are few technical challenges or barriers. Mandates need to be given to each representative on the NCCC. Members are not appraised on performance on their NCCC work, nor on taking any actions from the NCCC into their respective ministries or institutions. As a result, NCCC meetings and workshops are isolated events, and little action is translated into every day activities. This has resulted in a push for proper unit/National Secretariat, with full time staff dedicated to climate change-related work e.g. one person permanently assigned to vulnerability and risk. The National Secretariat would be hosted within the MTEA.
3. The NCCC are about to engage in developing a national climate change policy, and have potentially secured US\$500,000 for this. Further information, however, is limited at this point. The National Coordinator agreed that a water chapter could be written under this SCCF programme to feed into this process.

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4. There is a draft water policy currently circulating for stakeholder consultation. A workshop engaging stakeholders was held, indicating the policy has been revived.
5. The implementing partners are: i) the MNRE as the lead executing partner because of the DWA; ii) the MOA due to SWADE; iii) the MOEPD as all project funding goes through this Ministry; and iv) the MTEA.
6. There is a great deal of activity in terms of climate change initiatives, with much duplication of efforts. The various programmes are trying to create synergies, however, the NCCC failed to identify all the stakeholders initially, such as the private sector and NGOs. The sugar cane industry is apparently undertaking its own adaptation activities, but these are not strategically aligned within a national context. The NCCC is dominated by the public sector and they need to improve engagement with the private sector, NGOs and donors. The NCCC has mainly working with the UNDP/GEF and the EU and approached them through the MOEPD.
7. With regard to engaging with high level decision makers – the NCCC has planned a workshop on climate change for the 1<sup>st</sup> quarter of 2011 aimed at Members of Parliament. It is important to note that the politicians are representing sectors that are unequal in vulnerability. The NCCC wants leaders to promote public awareness and campaigns on climate change. There is UNDP funding for this, which is temporarily on hold until next year (due to the Government financial situation at the moment).
8. A challenge for the NCCC is that they are reporting to an intermediate body who then reports to the minister, who at the time of the meeting was in Cancun for the UNFCCC Conference of the Parties. The minister then reports to the cabinet/Prime Minister. The NCCC therefore does not report directly to the Prime Minister's office but via the chain of communication.
9. The NDMA, on the other hand, reports directly to the Deputy Prime Minister's office. The NDMA, however, is critically understaffed. There is a member of the NDMA on the NCCC.
10. There is a unit in the MOA which receives information from the Meteorological (Met) office (seasonal/three monthly forecasts). There are, however, doubts about the effectiveness of this unit as there is no institutional setup. Forecasting of 1 – 5 days has improved greatly in Swaziland, although there is not sufficient detailed information e.g. where a hail storm or wind storm will strike. There is fairly accurate forecasting (on six hourly basis) of flooding events. The Met office is currently investigating forecasts via text messages to mobile phones, and a small group of people have been involved in this pilot project to date.
11. The NC asked if it is in the mandate of Met office to make flood alerts. The Coordinator replied that they are most likely only allowed to send out rainfall forecast information, whereas the NDMA would have the mandate to send out flood warnings. There needs to be improvement of coordination of this response and information.
12. The NCCC has been successful in starting to sensitize different sectors to climate change challenges. For example, the Department of Public Works realized through the NCCC that due to an increase in rainfall drains need to be cleared out 3 – 4 times in the rainy season, as opposed to once before the season, as in the past.
13. The Coordinator feels the NCCC has adequate expertise as each member is an expert in their field. However, there is not enough coordinated research in relation to floods i.e. flood models.

14. There has been a vulnerability assessment undertaken on the water sector. This however, was too generic and wasn't specific enough to the Swaziland context.
15. There has been little research in terms of cost-benefit analysis of dams and water infrastructure in a climate change context. Dam building in the past has been politically driven, which makes tackling the issues challenging, as politicians want to see tangible activities on the ground so that they can show progress to their constituency. Long term planning is not a priority for many politicians and there is a focus on short term changes and activities.
16. As a result it may be advisable to bring in independent parties/consultants for presenting information at a high decision making level, to remove the suspicion of political agenda.
17. Important to note is that climate change is a secondary issue for members of the NCCC and it is not in their mandates or their responsibilities to mainstream climate change into their work. This needs to be addressed through additional targets and performance appraisal. If ministries are not held accountable through the performance appraisal system, climate change-related issues are not likely to be incorporated into their work.

**10. Meeting with representatives of the SWADE, LUSIP project, 06 December 2010.**

The following points were noted at the meeting:

1. Meeting participants (all involved in engineering and irrigation): Musa Masilela, Bafana Matsebula, Nkululko Dlamini, Ismael Nehuman.
2. Phase I of LUSIP covers 6,500 ha of farm land, and will cover another 5,000 ha in Phase II. SWADE offers support in designing the systems. EU funding is being used to help the sugar sector in developing and training (through SWADE).
3. They are doing capacity building in the Usuthu and Ngwavuma basins.
4. There are WUAs that are trained in all aspects of the Water Act.
5. They will be doing a feasibility study of designs of canals for Phase II through the AfDB (climate change is addressed in the terms of reference).
6. They are eager for information and scientific knowledge on climate change, and have begun to gather the available scientific information for a review paper.
7. Training of trainers to undertake capacity building is feasible.
8. Phase I is 50% complete and there is a need to develop the irrigation for the remainder of the 6,500 ha. In 2011 the feasibility studies for Phase II will be complete. In 2012 the extension of the canals for Phase II will begin, as will the building of the storage dams for the other 5,000 ha. Completion is expected by 2014.
9. There will be a water management unit which will control and manage the infrastructure for the farmers.

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10. Weather stations would be advantageous, for guiding agricultural activities and water usage. The closest station is at Big Bend which is at present too far downstream with very different conditions to the LUSIP site.
11. There are potentially approximately 15 people in SWADE who could be trained/capacitated to train farmers/WUAs.
12. Knowledge empowerment at a technical level is needed i.e. the engineers and technicians need more information so they can plan infrastructure accordingly. The modules currently taught to the farmers include:
  - a. Water management.
  - b. Training of trainers.
  - c. Sugar cane production – through a manual (prepared by the Swazi Sugar Association) aimed at local conditions.
  - d. Environmental policy, down to farm level (includes preparation of an environmental CMP for each farm).
  - e. Agri-business (agronomics of cane and other crops and business management training)
  - f. Employment regulation.
13. A separate module on climate change can easily be added to this. Climate change should be mainstreamed into other modules so that it is not seen as a separate environmental issue but rather as a development issue that will affect all facets of life.
14. Phase I needs to be reviewed in retrospect to research into whether or not there was evidence of climate change. The feasibility study will incorporate climate change issues into Phase II.

A separate meeting was held with **Ray Gama** – who works for SWADE on environmental matters.

1. Over the last 18 months there has been a realization that climate change has not been considered in the environmental CMPs. This will be addressed in Phase II, but is an issue for Phase I. Mr. Gama's team assists the farmer associations in preparing the environmental CMPs, but they need to advise the farmers on climate change-related issues. The intervention of technical information should target the farmer associations, whilst a general climate change sensitisation of the community should be done to increase baseline knowledge. They need assistance in the implementation plans and also modifications of existing systems.
2. From each canal there are a number of distribution lines. Each distribution line supplies water to a number of farmers that are grouped in farmer associations. A number of farmer associations, equating to the number on the distribution line, form a WUA.
3. Approximately 10 people will need to be trained to train the farmers. The Planning and Institutions Development unit targets traditional leaders, so it may be beneficial to include them.
4. There is very little groundwater being used in the Middleveld around the Phase I LUSIP site, and surface water is key.
5. The Government can advise RBAs to reduce abstraction; this is the Disaster Risk Reduction (DRR) response, and sprinklers and centre pivots are used. One area of adaptations for sugar cane may be in how to reduce water loss when ploughing.
6. There are 47 farmer associations and 10 WUA in Phase I. As the WUAs include the farmer associations, the WUAs should be targeted.

**11. Meeting with Mr. Obed Ngwenya, Director, DWA, MNRE, 08 December 2010.**

1. The DWA have been considering climate change and there is a great deal of uncertainty in weather events. Water harvesting (including dams) is seen as an adaptation measure.
2. There are a number of dam sites that have been identified (see Meeting 10) but they would like to make sure that climate change-related issues have been adequately dealt with.
3. The AfDB is funding a dam to supply Manzini and Mbabane. Extra water is required for this area, particularly as a technology park has been planned for Manzini.
4. 95% of water in Swaziland goes towards irrigation, and allocation of water is at full capacity. Storing water is seen as the only response.
5. If there are one or two year droughts the sugar cane crops are adversely affected.
6. MOA is gathering research on alternative crops i.e. different maize seeds, sorghum and others. There are some experiment fields, one at Big Bend. There is more drought experienced in the Lowveld, hence a focus in this area.
7. The International Relief & Development agency and World Vision are undertaking water harvesting at a homestead and school level; and storing the water in underground tanks.
8. Government is not adequately addressing climate change adaptation. For example, they encourage people to buy tanks but they don't have any subsidies for them and houses are not properly constructed to accommodate storage tanks.
9. There is a rural water supply programme with the aim of reaching the MDG of all households having access to potable water within 200m by 2022.
10. The NWP is developing and there has been stakeholder engagement. The chiefs were engaged with first, followed by stakeholders at a basin level, followed by national engagement.
11. The NWA has just been gazetted. They are reviewing the final policy draft which will be sent to cabinet early in 2011.
12. The National Water Master Plan is being completed and should also be finalised by the NWA in 2011. The NWA, which should be finalised by June 2011 and will start with immediate activities and plans, provides policy advice to the Ministry and guides activities such as where dams are placed and which water schemes are put into effect. It is structured as follows: there are four ministries represented on the NWA: i) natural resources and energy; ii) health; iii) agriculture; and iv) economic planning. The DWA forms part of and is the Secretariat of the NWA, and provides the technical advice. There is also one person from each of the five RBAs on the NWA, who will issue permits. There are thus nine people in total on the NWA.
13. Rural water supply is a focus and at present, and infrastructure that is not working has been identified.
14. With the assistance of an organization called 'Water Aid', all boreholes and schemes and being mapped, from macro-scale infrastructure to micro-scale systems such as hand pumps, and



information such as sources of power state of infrastructure is being collected. A map will be produced in March/April 2011. This is a continuation of International Relief & Development's work.

15. Water Services is now under the MNRE.
16. People in Swaziland think that water is a free resource and there are many schemes that are not working because the communities are not paying for the services. It's therefore very difficult to manage and is a major problem.
17. There is a long procurement process in Government; this needs to be considered when devising plans for programmes.
18. The only money the water services are making is from Mbabane and Manzini.
19. There is a pricing policy in the water policy.

**12. Meeting with Mandisa Zwane-Machakata, UNDP HIV/AIDS Programme Unit, 8 December 2010**

The following points were noted at the meeting:

1. The programmes function is: i) coordination and mainstreaming of human rights; ii) governance of HIV; and iii) governance of the rights of citizens. They also address gender dynamics that cause infection in people.
2. Climate change adaptation most likely links more with the impacts of HIV. Hospitals don't have the capacity to look after all HIV patients and therefore home based care is critical. For good and effective home care, people need access to clean potable water so that sanitisation levels can be kept high at all times.
3. UNDP focuses on clean water and hygiene which is critical for all disease care. 80% of TB patients have HIV.
4. Most organisations target the mobile areas such as borders where infection is the highest.
5. Swaziland is doing relatively well with regards to malaria. However, should malaria-areas spread as a result of climate change it will seriously burden the population already living with HIV. Likewise, if cholera becomes a problem it will have serious impacts on an already vulnerable population.
6. Water supply is critical. This is particularly so for HIV mothers with babies. To reduce transfer of HIV to babies, access to freshwater is required to ensure cleanliness at all times.
7. Government is focusing on prevention.
8. NCPs are in place, these are where children at risk and orphans are fed by the community. These are well connected to traditional structures.
9. United Nations Children's Fund (UNICEF) is looking at installing toilets and teaching communities how to build toilets. They aim to target 60% of the population.

10. The UNDP HIV/AIDS Programme works closely with the UNDP gender unit.
11. Women walk far to collect wood and water in Swaziland.
12. For the most vulnerable communities there is urgent need for access to water. The poverty/HIV link is strong.
13. The gender mainstreaming aspect is important, particularly with the increase in gender based violence when walking long distances to get wood and water. Responding to water access would address two MDGs: HIV and hygiene.

**13. Meeting with Joseph Mutsigwa, UNDP Disaster Risk Reduction (DRR) Programme Unit, 8 December 2010.**

The following points were noted at the meeting:

1. The programme “Strengthening National and Community Responses to Disaster Risk in Swaziland” is completed. It was essentially a capacity building project informed by the Hyogo Framework.
2. The DRR agency is now under the Deputy Prime Minister’s office. Only the Director of the Agency has the required skills. It is still very new and requires capacity building. Their intervention only went as far as training.
3. There were two pilots:
  - a. At Matsenjeni South in the Lowveld where they partnered with World Vision and tried to establish a community DRR system.
  - b. At Maphalaleni a steering committee was set up and trained and went on a knowledge exchange to the other pilot. They ran out of funding/time to take the project further, however.
4. Highlights:
  - a. Training on contingency planning, for example, cholera and H1N1 contingency plans were developed. Trainees now have the skill to develop plans at a national level. What is missing is capacity to undertake contingency planning at a local level. To address this, World Vision is engaged in developing community disaster preparedness plans.
  - b. DRR was supposed to be integrated into sectors, but only tools were provided.
  - c. Supported a review of DRR policy which is about to be presented to cabinet.
5. An end of project review report was written and is available.
6. There has been over a decade of drought and the provision of food aid. This was supposed to be short-term but has persisted. Eventually it was decided that a NDMA was required. When most people think of DRR, they think of drought and food aid; teaching people about DRR is therefore challenging.
7. There is a lack of coordination of DRR and climate change adaptation in Swaziland even at UNDP level. When the UNDP was developing its Country Programme Action Plan (CPAP) an attempt was made to integrate the two, but this was not successful.
8. A study was undertaken on the social, economic and environmental impacts of DRR.

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9. Construction, development planning and building codes need better planning. In general, land use planning is needed, as there is no related policy in Swaziland.
10. In Matsanjeni South they changed the way they build houses in response to wind storms, meaning houses are now more resilient.
11. There is a lack of capacity at the Met office.
12. A climate outlook forum has been initiated which brings the users of climate data (i.e. farmers) and the producers of the information together. A budget, however, is needed and it must be backed by Government. There needs to be a sustained service to get information to farmers. This year, for example, there was no national dissemination of information, only via newspapers and television.
13. DRR has been included in primary and secondary school curricula. The programme, however, is finished and experts now assist on a voluntary basis.
14. UNDP support is now minimal. UNICEF now has a large DRR component and together with World Food Programme may take over aspects of the programme. The Red Cross is also involved.
15. It is now the responsibility of the NDMA to mobilise and coordinate all the partners carrying out the required work, but they need support to initiate and sustain momentum.
16. The Food and Agriculture Organization is apparently also working on conservation agriculture related to climate change adaptation.

**14. Meeting with Mr. Nsindiso Dlamini, SWADE, KDDP project, 13 December 2010.**

The following points were noted at the meeting:

1. KDDP is similar to LUSIP, but was the first project that SWADE initiated aimed at bring development to the vulnerable area using water. The project includes:
  - a. an agriculture unit;
  - b. diversification with other crops such as: maize, beans and mushrooms;
  - c. a livestock unit. There are major projects promoting 'indigenous' cattle, chickens, broilers and fish ponds; and
  - d. a unit that deals with water and sanitation on the health side. They have schemes at Mafucula, Malibeni, Sihhoye and Gamedze (which is under construction) for providing potable water. Tunnels to produce vegetables have been constructed at one site. Those around Gamedze have broadened the agricultural area due to the available water.
2. In terms of plans for the next four years, an exit strategy is being formalized to change KDDP from a project to a programme.
3. The following questions were asked: i) how are communities running things at the moment; ii) is it SWADE funded; and iii) what are the contributions of the communities? In answering, the Sivuje potable water scheme was used as an example. Every homestead has a meter and pays every month (R25 a month). After everything is finished they then have a site hand-over. Every household was supposed to have a 10 x 10 m vegetable garden which would help them pay for the water.

4. There were problems, for example, at Malibeni. Sand filters were used which slowed the flow of water resulting in the community bypassing the filtration system to increase the flow rate. As a result, the community ended up drinking water straight from the river.
5. There is an initiative for planting trees. When a new farm is developed many trees are destroyed. Some trees are only from that specific area, so a nursery was proposed to propagate indigenous trees. A dispute over the land has caused delays. Usually land in the buffer zone is degraded with few trees, so tree planting by farmers is encouraged. Trees are therefore required and the SEA has promised access to a fund.
6. There are environmental complaints officers within the farmers associations who have been trained in an attempt to service the wider communities.
7. Other MDGs are being addressed through the project as well. Some businesses have emerged as 'spin-offs' of the sugar cane industry. Not all soils are suitable for sugar cane so other crops are grown as well. Many farmers had their own business ideas before SWADE arrived so the project looks to develop these ideas.
8. There are still some farmer associations that are in the development phase, meaning modules on environmental and social development are still being run. People who engage with farmers are from: i) the business unit; ii) agricultural unit; iii) community development (social) unit; iv) environmental unit; v) diversification team (crops and livestock); vi) engineering team (educate on pump maintenance etc) and vii) the potable water and sanitation team (also do community mobilisation and training).
9. SWADEs Environmental Department is in charge of educating the farmers on the removal and control the alien invasive plants along the river.
10. SWADE has a good relationship with the other stakeholders.
11. There is no farmers association that has been cut off from the assistance of SWADE. While they are part of Emandla Ekuphila, SWADE is still working with the farmers.
12. SWADE has its own defined project boundary, as does World Vision. For safety and health, NGOs are usually used.
13. With regard to the transition from a project to a programme, there is an end date and budget for the project. KDDP is approximately 10 years old and was supposed to end in 2009 as a project, but there are still studies outstanding. From the studies that have been completed some difficulties for farmers have emerged. For example, with regard to business, they still need assistance and advice on signing of payments and general accounting. So the following units will most likely stay in the transition to a programme: i) business; ii) engineering (due to the pumps); and iii) social (because of the social issues). SWADE could potentially service this area through the LUSIP.
14. They have an environmental impact assessment and a mitigation plan. Each farming association has their own as well.
15. There is a committee that is supposed to look after the nursery. The different environmental compliance officers from the different WUAs were in charge. So these officers are effectively employees of different businesses and may have challenges over assigning the trees. There needs to be a board with a rotating chairman to make sure this challenge is resolved. They need to sort

out the land issue first; the land they have identified between 2 and 4 ha. An investigation into the feasibility of earning carbon credits needs to be undertaken. The MOA are conducting trials on growing indigenous trees and will advise. There will be a preference of natural species i.e. savanna tree species, Marula spp.

16. A broad description of trees is provided in the CMP for each WUA.

**15. Meeting with Dr. Leonard Ndlovu, Swaziland Royal Sugar Corporation, 13 December 2010.**

Dr. Ndlovu also represents the RBA and the Swaziland Water Partnership (SZWP), which is linked to the Global Water Partnership. The following points were noted at the meeting:

1. The National Water Partnership has gone through some changes as there is a lack of funding in the region. In Swaziland it has relied entirely on donor funding. There have been efforts to raise funds internally with limited success. They had a Programme Manager for a while. It is now housed within the MNRE. They hope to be based within one of the RBAs until a more permanent home is found.
2. There could be scope for SCCF to find a more sustainable base. There is a structure to identify and engage with all stakeholders and a basin level, but not at a national level. The partnership could play that linkage for inter-basin consultations. The SZWP have gone dormant at the moment, and are currently only circulating newsletters to the members. It does include a very wide range of stakeholders such as Water User Groups, the private sector, and Government. Importantly it is multi-sectoral, i.e. not just stakeholders from the water sector.
3. What is lacking is awareness of the changes in recent times. Most agriculture is rain-fed, such as maize, and the planting season has been shifting. For example in August/September there was no rain but many farmers planted crops as this is the traditional planting time. The rains, however, only came in mid-November, meaning those planting in October had good yields and those that planted at the traditional planting time suffered massive crop failure at a subsistence level.
4. At Royal Sugar Corporation they plan their sugar cane harvesting for during the dry season. Harvesting was planned for April 2010 but they had huge rainfalls and the dams filled up. This pushed the harvesting season out of sync. The impact on such changes in planned harvesting are severe as they plan harvesting on the demand of the EU, make commitments for deliveries and are then not able to meet those commitments.
5. Irrigation infrastructure is insufficient, and irrigation needs have increased due to less predictable rainfall and increased evapo-transpiration i.e. impacts of climate change. The irrigation sector needs to take climate change into account when re-considering the required infrastructure.
6. Research into planting different crops at different times of the year is required.
7. The Royal Sugar Corporation have done some climate change work but focused on water scarcity.
8. This is the first RBA and much needs to be done as it is still relatively young. They want to encourage stakeholder participation due to the realization that agriculture cannot go on without irrigation and water resources are stressed. This may result in conflict, necessitating conflict resolutions skills within the RBAs. Transparency in the running of the organization is important, so that equal distribution of water is evident to all. There needs to be trust between the authority and stakeholders. Perceptions of private sector in the past have not been good, so stakeholders need to trust the process. For example, RBAs will need skills in explaining water scarcity and fair allocations and why water pricing is needed. At river basin level this will be very crucial and for

the authority members as well. Stakeholder consultation is very dynamic and RBAs need to be able to engage in this complexity, for example, when farms change hands.

9. For all stakeholders there should be capacity building through the RBAs on climate change, and it will be crucial for the people managing the resource to be aware of climate change and for them to be able to justify certain actions to the greater stakeholder group. For example, if valves have to be shut because of the impacts of climate change, this will have to be communicated to the stakeholders in an appropriate and effective manner.

**16. Meeting with Mrs. Lynne Kota, Environment Manager, SWADE, 14 December 2010.**

The following points were noted at the meeting about the other GEF project:

1. The GEF project is a Sustainable Land Management (SLM) project. LUSIP is having an impact on the surrounding communities that are not part of LUSIP because as a result of shrinkage of grazing land, livestock from the original LUSIP area are moving into the surrounding. Communities around LUSIP therefore need assistance to manage this situation.
2. One of the main benefits for these communities is to plan and implement chiefdom development plans which will identify several projects for implementation. Alternative livelihood projects are also identified. Several meetings have been held with communities to raise awareness and to demonstrate on how to mitigate against impacts of LUSIP. It is a four year project that could be replicated in other communities. The project is IFAD (through SWADE), GEF and Government funded. In Phase I, most likely 15 chiefdoms immediately surrounding the LUSIP project area will be included.
3. Mrs. Kota reiterated that the climate change component could be good for the CMPs and to climate proof LUSIP activities.
4. Implementation of this GEF project will be difficult because they will be using Government staff and many people are involved. The National Steering Committee has not yet signed off on the budget. The MOA is the lead agency, with the Project Manager housed in the SWADE office. SWADE may take over the process to procure the staff. Rapport with the chiefdoms has already been established.
5. Environmental management was seen as a separate issue at KDDP and seen as unimportant. It has to be mainstreamed to make it relevant and important to stakeholders, as is the case in general for climate change.

**17. Meeting with Mr. Bongani Masuku, Under-Secretary, MOA, 18 December 2010.**

1. The main purpose of the meeting was to fill out the capacity assessment form and to understand the role of the Under-Secretary in relation to the project. Mr. Masuku was familiar with the background of the project, and was happy that it was being driven by the MNRE's DWA. He felt this was a legitimate home for the project after initial uncertainties.
2. Mr. Masuku confirmed that the GEF-funded LUSIP project had full ownership of the Ministry. The Ministry requested SWADE to facilitate procurement of the Project Manager. He saw this as an important link to the present climate change adaptation project. He also saw other related initiatives such as the earth dams construction by the Ministry as important. The NC was advised to follow up on the issue of alien invasive plants, and to encourage the project designers to see if collaborative efforts could not be established with the extension service of the Ministry.

3. The meeting was concluded with the filling of the capacity assessment form.

**18. Meeting with Ms. Futhi Magagula, Forestry Officer, Forestry Department, MTE, 20 December 2010.**

The following points were noted at the meeting:

1. Ms. Magagula highlighted some areas where there was an outcry in relation to the spread of alien invasive plants. The areas included the Lusushwana watercourse, Mkhiweni Inkhundla amongst others. She also indicated that the Department had recently undertaken a mapping exercise on alien invasive plants. Through use of extension work the Ministry had been involved in the fight against such plants. Due to scale and limited capacity within the Department this work was outsourced. However, there is now political pressure for community members to be employed to clear the plants. In relation to costing of such activities the NC was referred to a certain Mr. N. Matsebula within the same Department, who unfortunately was already on leave at the time.
2. There is a general concern of over-exploitation of natural forests, which are presently under high pressure. The Flora Protection Act is attempting to protect these and prohibits the sale and export of natural plants. Reforestation efforts are ongoing through extension services where communities are empowered to undertake the work. The country needs a comprehensive inventory of forest stocks and surveys need to be done. Recent experience has shown a significant difference between the most recent estimates and what is present on the ground.

**19. Meeting with Mr. Bongani Magongo and Mr. Khoza Mathokoza, officers, Land Development Section, MOA, 21 December 2010.**

The NC met the two officers from the Land Development Section of the MOA. The aim was to: i) get an appreciation of planned and ongoing work in relation to earth dam construction; ii) ascertain if there will be work in some of the visited sites; and iii) establish the cost of such work.

1. The earth dam construction programme is generally demand-driven and was started after the severe drought of 1991/92. Water harvesting this way helps communities with water for livestock, gardens and general domestic use. Generally the Ministry has a defined programme, but political pressure (for equity reasons) is now such that about five dams have to be constructed per Inkhundla. It transpired that the Emkhiweni Inkhudla (Kutsimuleni), which was one of the visited sites, is next in line. Other sites include Mbelebeleni (1 dam), Kutsimuleni (2 dams) and Dvokolwako (2 dams). Construction will likely start at the beginning of 2011, and should be complete in mid-2011. The NC sees this as an opportunity to incorporate climate change adaptation interventions for these areas. It also was established that for KaShewula the Ministry will do a feasibility study for one or two earth dams in the first half of 2011. However, there are no immediate plans to construct these. The NC sees this as another opportunity to help this vulnerable community as part of the project.
2. For costing of the dam construction work, it was explained that the Ministry was not the appropriate body to comment. The NC was referred to the private sector and NGOs, who had been involved in such work.

## **Annex 6. Inception workshop report**

*Royal Swazi Convention Centre, Ezulwini*

*18 November 2010*

### **Background and purpose of the workshop**

The Government of Swaziland (GoS), through the Ministry of Natural Resources and Energy (MNRE) as an executing partner, is implementing the above project with the support of the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF). The goal of the project is to ensure that the management of Swaziland's water resources is adapted to take into account the anticipated impacts of climate change. The objective of the project is to promote the implementation of national and trans-boundary integrated water resource management that is sustainable and equitable given expected climate change.

The project will deliver adaptation benefits in relation to water resources management that is sustainable given expected climate change, which will also enable the protection of livelihoods under climate change conditions, by: i) developing policy response options derived from community- and macro-level risk analyses; ii) developing tools for equitable water resources management; and iii) adjusting sectoral investment plans in the water and agriculture sectors to take into account future climate change impacts. The project will generate benefits related to Millennium Development Goal 1 on reducing poverty and hunger.

The first stage of the project is the development of a comprehensive UNDP project document which must be prepared by March 2011. International and national consultants have been appointed to assist with the drafting of the project document as well as the GEF CEO Endorsement Request. Funding for the project will come from the Special Climate Change Fund (SCCF).

An Inception Workshop was organised to formally introduce the project to relevant stakeholders, get their views on the project and to facilitate the selection of project sites and measures. The Inception Workshop was held on the 18<sup>th</sup> November 2010 at the Royal Swazi Convention Center, Ezulwini and was attended by 35 participants (see Annex III for the list of participants).

### **Workshop Proceedings**

#### **1. WORKSHOP OPENING**

The workshop was opened by the Under Secretary of the MNRE, Mrs. Thembisile Mkoko, who was representing the Principal Secretary. In her opening remarks, Mrs. Mkoko noted that climate change as a subject has gained prominence at the international level as well as at the national level because of the very real threat that climate change poses to human life. She noted that Swaziland already had firsthand experience of the impacts of climate change in that certain parts of the country were already experiencing lower food production, which contributes to poverty, social and economic hardships in drought-prone areas. As a result Swaziland has been receiving food aid since 2001.

The economy of Swaziland is agro-based and highly dependent on large-scale irrigation of mono-crops like sugar-cane, citrus fruits and others. Mrs. Mkoko noted that due to the projected impact of climate change there will be decreases in stream flows for Southern Africa, something that could have significant consequences for the Swaziland agro-based economy unless appropriate adaptive strategies are put in place.

Mrs. Mkoko however cautioned that Swazis should not blame everything on climate change as non-climate practices such as poor water resources and land management are also contributing factors.



Before declaring the workshop opened, she made an appeal to experts in the field to join hands with Government as the country tried to better understand the impacts of the climate change phenomenon and attempted to develop appropriate strategies for the country against it. She particularly welcomed the UNDP/GEF initiative as it provided an opportunity for this partnership.

## **2. PROJECT ORIGINS, OUTCOMES, ROADMAP AND WORKSHOP OBJECTIVES**

Dr. Anthony Mills, the leader of the consulting team, presented on the project's origins, objectives and outcomes and workshop's objectives.

### **2.1 Project Origins**

Dr. Mills explained that the project was applying for funding from the SCCF which was established under the United Nations Framework Convention on Climate Change (UNFCCC) in 2001 and managed by the GEF. Of the SCCF's programming priorities, this project would fall within the 'water resources management' category.

He highlighted that the Project Identification Form (PIF) for this project was initiated in 2008. He then presented the project outcomes which are as follows:

- **Outcome 1:** Informed and inclusive national dialogue around vulnerability to climate change and water allocation in Swaziland among productive and domestic uses.
- **Outcome 2:** Climate change risk management integrated into the implementation of national policies and programmes to promote adaptation on a wider scale.
- **Outcome 3:** Negotiations on trans-boundary water management for the Incomati and Maputo river basins informed by climate change risk analysis.

### **2.2 The Road Map**

Dr. Mills then presented the roadmap for the project development process which can be summarized as a 7 stage process as follows (see Annex I for additional details):

1. Special Climate Change Fund (SCCF)
2. First National Communication (FNC) to the UNFCCC
3. Project Preparation Grant (PPG)
4. Inception workshop – Start of prodoc development
5. Project preparation – complete prodoc development
6. Project Document

The PPG phase extends from November 2010 to March 2011. The Project Document development process has a number of stages as presented below. Dr. Mills highlighted that the listed stages were not necessarily to be executed in series (one after the other), but some would be executed at the same time. The stages are as follows:

1. Collect **baseline** information (i.e. determine the 'Business as usual' situation).
2. Document **climate change risks** in details. Determine the **root causes** of problems.
3. Develop proposed outcomes, outputs in greater detail.
4. **Undertake a Barrier** analysis, **cost-benefit** analyses.
5. Select most vulnerable **sites**.
6. Select appropriate **adaptation interventions** for those sites, and determine scale/cost.
7. Determine the **roles and responsibilities** of stakeholders.
8. Obtain **co-financing** letters.
9. Submit draft 1 of project document. (Late January 2011)
10. Validation workshop (Late February 2011).
11. Submit to GEF (Late March 2011).

In relation to the co-financing letters, Dr. Mills emphasized the importance of organizing these as early as possible. He also explained that co-financing was not as complicated as it is often thought of in that institutions can just declare the budget they have already provided for water management or development related activities as counterpart funding. Even in-kind contributions are eligible as co-financing.

### **2.3 Workshop Objectives**

Dr. Mills concluded his presentation by highlighting the objectives of the workshop. He explained that initial ideas for adaptation measures to be undertaken by the project would be presented during the workshop and stakeholders were being requested to assist the consultants on identifying adaptation priorities for Swaziland's water sector. The workshop objectives were as follows:

1. Provide overview and background of the project.
2. Start the development of the project document.
  - a. Assessment of **institutional landscape** and identification of strengthening needs.
  - b. Select most vulnerable **sites**.
  - c. Select appropriate **adaptation measures** for those sites, and determine scale/cost.
3. Plan the further development of the project document.

### **DISCUSSIONS**

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- Dr. Mills was requested to clarify on the sites selection idea as this was not clear from the listed project outcomes. Dr. Mills explained that demonstration sites were a GEF requirement and that this was also responding to the second outcome, in particular to the aspect of "... implementation of national policies and programmes..."
- Dr. Mills was also asked to clarify points related to accessing funds from the SCCF. Stakeholders were directed to approach the GEF national focal point, the Executive Director of the Swaziland Environment Authority, in relation to the national SCCF.
- Participants were assured that the presentations would be made available electronically and in hardcopy. Hardcopy documents could be obtained from the Department of Water Affairs' (DWA) office, at Millers' Mansion building in Mbabane.
- Participants also wanted to know how the National Consultant (NC) would work with the communities, particularly at the River Basin level. Dr. Mills assured them that the NC would be working closely with communities and at the various stakeholder levels including river basin institutions. There would be close interaction with communities in relation to the sites identified for further investigation and stakeholder consultation.

### **3. PRESENTATION ON PRINCIPLES OF THE SCCF AND ADDITIONALITY**

Dr. Mills presented on the principles of the SCCF. He started by highlighting the background on the SCCF and then went on to explain the key concepts involved namely: Adaptation, Additionality and Baseline. Adaptation has to do with the "modification" that is required in response to a change. Dr. Mills highlighted Adaptation versus Mitigation and Baseline versus Additionality.

Dr. Mills also presented the UNDP approach to adaptation which can be summarized through three intervention areas, namely: i) promote alternative development pathways; ii) accessing financing to meet adaptation costs; and iii) enhancing community resilience.

### **DISCUSSION**

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- Stakeholders wanted to know the extent of funding of climate change adaptation initiatives which are not necessarily directly in the water sector, such as the health sector. Dr. Mills highlighted that the focus of this project was on the water sector, however, if some suitable links to water sector adaptation related interventions can be established, this could be a possibility.

#### **4. PRESENTATION ON OVERVIEW OF CLIMATE CHANGE AND ITS EFFECT ON SWAZILAND'S WATER RESOURCES**

The NC, Mr. Dumisani Mndzebele, presented an overview on climate change and its effect on Swaziland's water resources. The situation shows an increase in the number of warm spells over southern Africa, and a decrease in the number of extremely cold days between 1961 and 2000; an increase in temperature of approximately 1 °C with an average warming of 0.05 °C per decade between 1900 and the 1980s; a 12% increase in days with temperatures over 35 °C and up to 50% decline in rainfall during the months of September and October; an increased inter-annual variability in the post-1970 period, with higher rainfall anomalies and more intense and widespread droughts.

The predicted situation for 2080 shows an overall increase in mean annual temperature. Increases in temperature are predicted both during the summer and winter seasons. A significant increase of extreme rainfall events with possible changes in rainfall seasonality is also predicted.

Impacts are seen from a number of areas such as loss of infrastructure, increase in waterborne diseases, decrease in food security, potential increase in trans-boundary conflicts and decline in crop yields.

#### ***DISCUSSION***

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- A concern was raised that the impacts seemed a bit exaggerated for Swaziland. The NC noted the observations, but highlighted that while the extent of the impact could be debatable there was presently consensus on the trends as presented. The representative of Ngwavuma River Basin concurred that the impacts presented were indeed what was being experienced in this river basin. The NC was also advised to, in future considerations, separate the impacts due to poor land-use and water resource practices from the impacts of climate change.

#### **5. PRESENTATION ON THE OVERVIEW OF POSSIBLE ADAPTATION MEASURES**

Daniel Malzbender, International Consultant team member, presented an overview of possible adaptation measures. He saw these as falling within the following adaptation areas:

1. Support climate-aware government and development planning.
2. Develop institutional capacity.
3. Create flexible allocation systems and agreements.
4. Strategic water infrastructure development and management.
5. Institute sustainable flood management policies.
6. Reduce external non-climate pressures.
7. Help species, human communities and economies move their ranges.
8. Specific agricultural adaptation measures.

These are elaborated on below:

##### **Support climate-aware government and development planning**

Government developmental plans should take into account potential climate change risks, which will likely require greater government capacity and training and the sharing of timely, relevant information between relevant government organisations. In promotion of water conservation practices, adaptation strategies should focus on developing robust water resources systems and should incorporate climate change uncertainties into the long-term planning models.

### **Institutional Capacity**

Successful climate change adaptation plans for the water sector require multiple actions to be taken and, importantly, coordinated through strong institutional capacity. Crucial institutional functions include: i) control and monitoring of water use; ii) monitoring and assessment of ongoing changes in systems; iii) monitoring and enforcement of pollution prevention; and iv) regulation of water infrastructure development and operation. According to Mr. Malzbender, functions required on local, provincial and national level require technical, administrative and political capacity and cooperation at all levels.

### **Flexible Allocation Systems and Agreements**

Allocation systems must be developed to protect key social, environmental and economic interests especially during times of variable water availability. To protect valuable ecosystems, water usage patterns must be adapted to changing flows by introducing more flexible allocation systems and basic social and environmental needs need to be given highest priorities. Water rights need to be well-defined, enforced and transferable and users must be confronted with full social cost of their actions. Institutional arrangements will require security, flexibility and certainty.

### **Strategic Water Infrastructure Development and Management**

From an ecosystem management point of view, infrastructure has become a tool in facilitating changes in species/communities. Potential modifications include: i) supply adaption (e.g. canal lining, changing of water intakes, closed systems; ii) higher dam walls, increased canal size, sediment removal; iii) construction of new infrastructure; and iv) alternative management systems (e.g. new operating rules/priority releases, conjunctive use of surface and ground water, coordination of supply and demand, integration of the reservoir system).

### **Sustainable flood management policies**

Adaptation strategies in relation to flood management policies should include flood risk management such that flood control measures are built to accommodate predicted climate change patterns. The focus should also be to reduce floods through natural means (e.g. movement of water through catchment areas and retention of water on uplands using floodplains). Developments in high risk areas should be avoided to ensure community resilience.

### **Reduction of external non-climate pressures**

Climate change will exacerbate stress from non-climate pressures. Often addressing these issues means addressing already-identified problems, but with more urgency and efficiency. Water pollution, alien and invasive species, overfishing and negative impacts of land use are some examples of non-climate pressures. Examples were provided on possible actions such technological, market/price driven transfers and others.

### **Help species, human communities and economies move their ranges**

To adapt to the impacts of climate change species, economic activities may need to move between systems as water resources shift. It may require the whole components of a system being relatively unpolluted and interconnected (e.g. 'web' of interconnected conservation areas). Humans may also respond by moving activities as circumstances demand. This of course, will require skills development and for policy-makers and resource managers to work with the affected communities in the process.

### **Specific agricultural adaptation measures**

Mr. Malzbender highlighted the following measures for the agricultural sector in relation to adaptation to climate change circumstances:

1. Drought-resilient, flood-resilient and/or early maturing crops introduced.
2. Post-harvest management of crops improved.
3. Alternative livelihoods developed (e.g. aquaculture, beekeeping, REDD+ income streams, new cash crops).
4. New irrigation measures adopted.

5. Anti-erosion measures implemented.
6. Watersheds and/or riverbanks reforested.
7. Capacity in pastoral land and/or cropland management developed.
8. Appropriate rangeland management implemented.
9. Rangeland policies (that take climate change into account) developed and implemented.
10. Planting of indigenous trees (even agro-forestry).
11. Mulching.
12. Contour ridging.
13. Tied ridging.
14. Potholing.
15. Grass fencing.
16. Terracing.
17. Bunds.
18. Conservation farming

## **6. GROUP WORK**

### **6.1. Introduction to group work & the group work session**

Dr. Mills introduced the group work. There would be four groups. Three groups would be working on the following geographic locations: the Maputo, Mbuluzi and Incomati River Basins. The fourth group would be looking into institutional and policy issues. The groups working on the three river basins had to identify a list of potential demonstration sites for the project and rank these sites according to importance. There were specific questions to be answered by each group on which it would report back to the workshop participants. There were also some scoring sheets to fill in relation to the selected sites.

### **6.2. Report back from group work**

#### **6.2.1. Maputo River Basin Group**

The group proposed six sites but recommended the site that was rated highest according to its need for capacity building and climate change awareness raising in both the Lusutfu and Ngwavuma River Basins. Below is a table of the summarized ranking by the group. The detailed scoring sheet is attached as Annex II.

<b>Site</b>	<b>Points (out of 30)</b>	<b>Comment</b>
Climate Change awareness capacity building (2 basins-Lusutfu & Ngwavuma)	26	Recommended site
Dam construction Ndunayithini (Nkanka/Lubalisi)	24	Not recommended
Sigwe/Phunga Donga Rehabilitation	24	Not recommended
LUSIP beyond Ngcamphalala	22	Not recommended
Kelele earth dam + Supply (Mankayane)	21	Not recommended
Solar Driven Borehole (Mantambe at Hluti)	20	Not recommended

Proposed areas of intervention in the selected site are as follows:

- Diversification: Sugar versus other crops.
- Campaigns: Schools, sport, debates, distribution of literature, workshops, competition.
- Stakeholder participation/consultations – WUA, ID & RBAs.
- Water harvesting.
- LUSIP: Lining of earth dams and canals.

- Lives system – water irrigation.
- Mobilize communities through technical assistance (TA).
- Model/training schedule/programme.

### 6.2.2. Mbuluzi River Basin Group

The group identified five sites in the basin for which it has provided a score and another two sites which cut across sectors. Over and above ranking the sites, the group also provided the estimate cost for each intervention and listed the potential implementation partners. Below is summarized the ranking by the group. The detailed information and scoring sheet attached as Annex II.

Site	Points (out of 30)	Comment
Conservation Agriculture (Shewula) - Cost: E 500,000	25	
Sand Dam (Shewula) - E 600,000	24	
Sand Dam (Kutsimuleni) - Cost: 600,000	23	
Invasive Alien Plants (IAPS) (Dvokolwako)- E 1 million/500ha	23	
Mlawula Nature Reserve Dam - Cost: E 350,000	20	
Curriculum changes & training (UNISWA) - Cost: E 150,000	-	No score
Parliamentary Capacity Building on climate change and workers - Cost: E 200,000	-	No score

The group did not select a particular site, but observed that the cost might be the limiting factor in light of the available maximum budget for the project.

### 6.2.3. Incomati River Basin Group

The group proposed five sites in the Lomati and Komati River Basins. The sites had been ranked but no specific recommendations were made in terms of the most preferred site. The detailed information and scoring sheet is attached as Annex II.

Site	Points (out of 30)	Comment
Rangelands conservation & potable water supply (Mlumati (Near Mswati II High))	23	
Potable Water supply, IAPs & soil conservation (Nyakatfo)	22	
Drought Resilient crops, IAPs & Alternative livelihood Projects (Mayiwane)	22	
Pump raising and soil conservation (Maguga-Mananga stretch (KDDP))	21	Might be very expensive
Soil Conservation & Potable water supply (Malanti-Nkomazi)	20	

### DISCUSSION

- The workshop observed though that while the group had proposed sound climate change adaptation interventions such as the pump-raising, the cost of some of them could be prohibitive in the light of the available budget for the project.

### 6.2.4. Policy /Institutional Group

The group presented the baseline policy and legislative framework in the country. It also identified the institutional framework and proposed additional institutions to be involved in climate change adaptation in the country. The group also addressed the aspect of current mandates and interactions,

*Adapting national and trans-boundary water resource management in Swaziland to manage the expected impacts of climate change.*

in particular highlighting climate change-related mandates of some of the national institutions. It noted though that the aspect of effective interactions was still at its infancy.

In relation to institutional strengthening the group highlighted the need for:

1. The Government to establish climate change policy.
2. A climate change strategy development and action plan.
3. The establishment of a Secretariat, to coordinate the implementation of the climate change strategy and action plan.

Details on the report back for the group are also included in Annex II.

## ***DISCUSSION***

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- Workshop participants wanted to know from the group what the relationship between the proposed Secretariat and the National Climate Change Committee (NCCC) was as it was felt there could be a duplication of roles between the two. After confirming from the group that the proposed action plan did not just relate to the water sector only, the workshop advised that it would be important for the project to focus more on activities that can readily attract funding from the existing project, which is focusing more on funding interventions related to the water sector.

## **7. CONCLUDING PLENARY DISCUSSION AND NEXT STEPS**

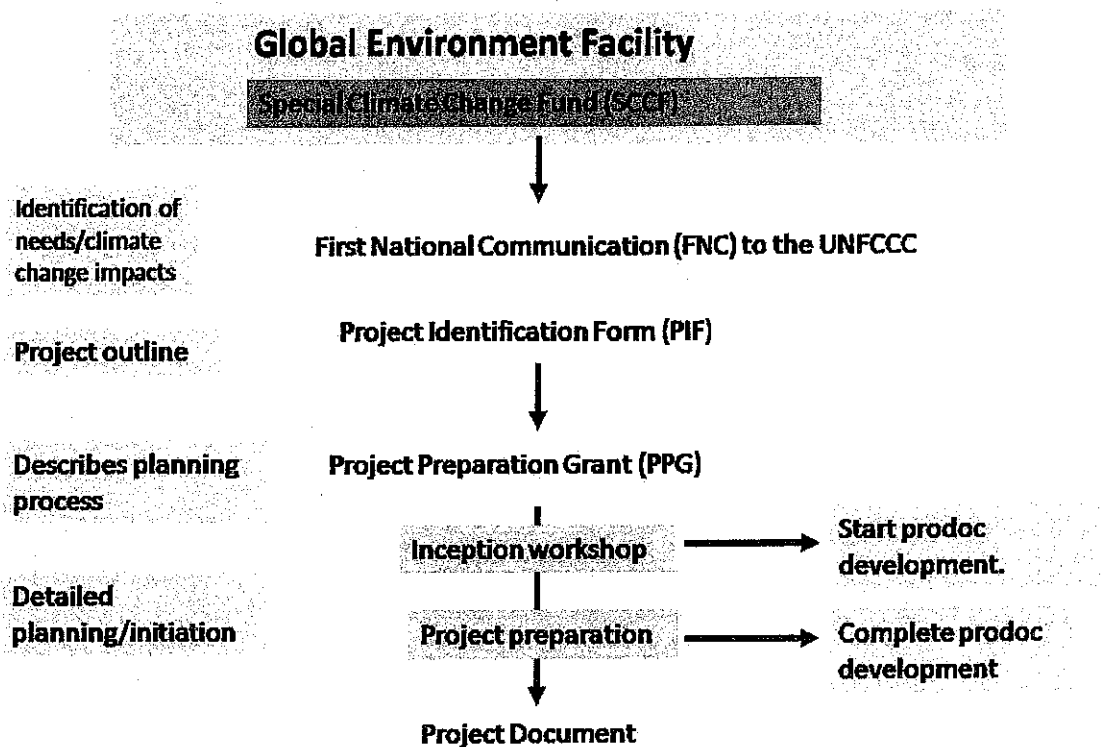
Dr. Mills thanked all involved for attending and for the quality of deliberations. He briefly highlighted the next steps before the finalisation of the project document. The inception workshop report would be produced and would inform the inception report. The Draft project document would be developed and circulated for comment at the end of January 2011. Before then the finalisation of the site selection would take place. At the end of February 2011, there would be the validation workshop. The NC would work closely with the concerned communities and the process would be as consultative as possible.

## **8. CLOSING REMARKS**

Mr. Skhiwe Nkomo made the closing remarks on behalf of the Director for the DWA. He thanked all participants for the attending and for their active participation. He assured them that their views would be taken into consideration in the process of formulating the project document.

**ANNEX I**

# Roadmap of the project development process





## **ANNEX II: GROUP WORK REPORT BACK**

### **GROUP 1: Policy/Institutional Group**

- I. Legislation
  - a. Water Act of 2002
  - b. Water Services Act of 1992
  - c. Environmental Management Act of 2002
  - d. Forestry Bill
  - e. Pesticides Management Bill
  - f. Energy Act - [ ? ]
  - g. Fire Control Act
  
- II. Strategies
  - a. Poverty Reduction Strategy & Action Programme
  - b. Draft National Water Master Plan
  - c. National Energy Policy Implementation Strategy (Draft)
  - d. Biofuels Strategy
  
- III. Existing Institutions
  - a. NCCC
  - b. Swaziland Environment Authority (SEA)
  - c. Meteorology Department (MTEA)
  - d. UNISWA
  - e. Dept of Agric-Crops Promotion Unit
  - f. Energy Department
  - g. REASWA
  - h. Forestry
  - i. SNTC
  
- IV. Relevant Policies
  - a. Draft Water Policy
  - b. Comprehensive Agriculture Sector Policy [2007]
  - c. National Food Security Policy [ 2007]
  - d. National Energy Policy [2003]
  - e. Irrigation Policy [2007]
  - f. Forestry Policy [2007]
  - g. Soil Conservation Policy [2005]
  - h. Land use Management Policy [2004]
  - i. Draft Land Policy
  
- V. Proposed Additional Institutions
  - a. Department of Water Affairs
  - b. Tinkhundla
  - c. Ministry of Education & Training (MOET)
  - d. Municipalities
  - e. Ministry of Public Works and Transport
  - f. SWADE
  - g. RBA
  - h. Swaziland's Electricity Company (SEC)
  - i. Human Settlement Authority
  - j. DPM's Office - National Disaster Management Office
  
- VI. Current Mandate and Interactions
  - a. NCCC

- i. Coordination of climate change issues
  - b. SEA
    - i. Environmental impact issues
    - ii. Monitoring of Pollution
    - iii. Authorization of Projects (Environment Friendly)
  - c. NMS
    - i. Systematic connection of MET data
    - ii. Forecasting and modeling of climate scenarios
    - iii. Information dissemination
  - d. UNISWA
    - i. Related Research & education
  - e. AGRIC – Crop Production Unit
    - i. Conservation Agriculture
    - ii. Training
    - iii. Research – Malkerns Research Station
  - f. Energy Dept
    - i. Mitigation
    - ii. Research
  - g. REASWA
    - i. Promotion/awareness/mitigation
  - h. FORESTRY
    - i. Regulating Forestry
    - ii. Eradicate alien Invasive Species
    - iii. Management of encroachment of rangelands
  - i. SNTC
    - i. Conservation and management of protected areas
    - ii. Mapping of species and trending in relation to climate change

## VII. Interaction

Infancy stage

## VIII. Institutions Best Placed

- a. RBAs
- b. RDAs – Extensions
- c. Tinkhundla Development Committees > MPs
- d. Media
- e. NGOs
- f. WASH Forum
- g. Academic Institutions & Schools
- h. Water Users Associations

## IX. Institutional Strengthening/Restructuring

- a. Government to establish climate change policy
- b. Strategy Development and Action Plan
- c. Establish Secretariat, to coordinate the implementation of the climate change strategy and action plan

## **GROUP 2: INCOMATI (KOMATI & LOMATI) GROUP REPORT BACK**

### **I. Adaptation Interventions**

- **Maguga-Mananga stretch (KDDP)**
  - Improve pumping infrastructure- raise pumps.
  - Develop feasible water allocation systems and improve dam operating rules.

*Adapting national and trans-boundary water resource management in Swaziland to manage the expected impacts of climate change.*

- Awareness raising and capacity building of communities on flood and drought.
- Planting of trees and building gabions on vulnerable sites, i.e. river banks, dongas.
- Development of local flood and drought contingency plan.
  
- **Mayiwane**
  - Drought resilient crops/Early maturing crops.
  - Alternative livelihoods improvement projects.
  - Replace alien invasive species with indigenous plants.
  
- **Nykatfo**
  - Provision of safe drinking water.
  - Control of alien species.
  - Building of gabions for soil erosion prevention.
  
- **Mlumati (near Mswati II High)**
  - Management and conservation of rangelands
  - Provision of potable water.
  - Mobilise communities to engage in commercial agriculture.
  
- **Nkomazi-Malanti**
  - Potable water supply
  - Building of gabions for soil conservation
  - Invasive plants control

## **II. Baseline Information**

- KOBWA- built Maguga and Driekoppies dams to increase water availability. Maintain and operate dams.
- SWADE-Livelihoods improvement through agricultural projects.
- River Basin Institutions- Manage water resources at different levels.
- Private enterprises- Livelihoods improvement through job creation i.e. Ngonini estate, Peak Timbers.

## **GROUP 3: MBULUZI GROUP - REPORT BACK**

### **I. Proposed Interventions**

- a. Conservation Agriculture
  - i. 20 homesteads reliant on agriculture in difficult climatic and soil conditions would benefit from climate change adaptation methods to improve yields, incomes and land stewardship
  - ii. Cost: E 500,000
  - iii. Other initiatives in the area have shown how beneficial this is. Duplication would help.
  - iv. Implementing partners: MOA (LUPS), FAO, COSPE, SNTC, Chiefs.
  
- b. Sand Dam on Shewula River
  - i. Water is in short supply in Shewula area. Communities (20,000) rely on surface water for domestic water needs.
  - ii. The dam accompanied with water conservation initiatives would help alleviate water shortages and poverty.
  - iii. World vision could co-finance elements of such an initiative. E.g. community mobilization and capacity building.
  - iv. Cost: E 600,000.
  - v. Implementing partners: MOA (LDS), Chiefs, WV, DWA.

- c. Sand Dam –Kutsimuleni
  - i. A tributary of the Mbuluzi in the Kutsimuleni area is suited to the construction of a sand dam. The technology has been tried and tested regionally.
  - ii. Cost: E 600,000.
  - iii. Other activities in the area: subsistence agriculture.
  - iv. World vision will bring about spring protection.
  - v. Dam will provide water for domestic, livestock and vegetable production all year.
  - vi. Implementing partners: WV, MOA(LDS), DWA, Chiefs.
  
- d. Invasive Alien Plants (IAPs) (Dvokolwako area)
  - i. IAPs are highly problematic in the area. They are progressively invading arable areas.
  - ii. Community clearance costs E 1 million to manage 500 ha (=> 2000/ha).
  - iii. Commercial activities: Diamond mining and cane farming.
  - iv. Generally the people are very poor and rely on agriculture. Employment opportunities are very limited. Farmers urgently need these types of interventions. Its impact on water has been demonstrated.
  - v. Implementing partners: Forestry Dept (MTEA), MOA (LUPS), Chiefs, Min. of Tinkhundla affairs, Local Agrochem co. SEA.
  
- e. Mlawula Nature Conservation Dam
  - i. Mlawula NR is a protected area vulnerable to climate change impacts and drought. The dam will go a long way towards providing much-needed water for wildlife and biodiversity. For example, crocodile could be re-introduced into the dam.
  - ii. Cost: E 350,000 (30 m dam, 3-4m high, 120m<sup>3</sup>).
  
- f. Curriculum changes & training
  - i. UNISWA's Faculty of Agriculture trains extension workers. However, the existing curriculum does not discuss climate change science and impacts.
  - ii. Review of the curriculum to include relevant climate change information would empower extension workers and improve their services.
  - iii. Cost : E 150,000
  - iv. Implementing Partners: UNISWA, MOE (Curriculum Centre).
  
- g. Parliamentary Capacity Building on climate change
  - i. MPs currently have low level of understanding of climate change and its impacts. This compromises their mandate to debate and discuss policies and bills that may be vulnerable to climate change, e.g. the Water Act and/or the Forest Bill
  - ii. Their importance in national decision-making and the need for them to understand varied topics/issues calls for them to be equipped with knowledge on climate change.
  - iii. Awareness workshops and simple materials with examples are required.
  - iv. Cost: E 200,000.00
  - v. Implementing partners: PM's office, Speaker, Portfolio committee, Chairs, Min of Tinkhundla, Bucopho.

**GROUP 4: MAPUTO (LUSUTFU & NGWAVUMA) GROUP - REPORT BACK**

**I. Proposed Interventions**

- a. Climate change awareness capacity building (2 basins)
  - i. LUSIP & Ngwavuma
- b. Dam construction Ndunayithini (Nkanka/Lubalisi)
- c. Sigwe/Phunga Donga Rehabilitation
- d. LUSIP beyond Ngcamphalala
- e. Kelele earth dam + Supply (Mankayane)
- f. Mantambe (Hluti) Solar Driven Borehole

**II. Recommended Intervention: Capacity Building Project: LUSIP & Ngwavuma**

- Diversification: Sugar versus other crops.
- Campaigns: Schools, sport, debates, distribution of literature, workshops, competition.
- Stakeholder participation/consultations – WUA, ID & RBAs.
- Water harvesting.
- LUSIP: Lining & NSDs.
- Lives system – water irrigation.
- Mobilize communities through TA.
- Model/training schedule/programme.

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**SCORING SHEETS**

**Group 2 (Incomati River Basin) – Scoring sheet**

Site	Vulnerability criteria										TOTAL (out of 30)
	Level of poverty 1 = not very high 2 = high 3 = very high	Access to safe drinking water 1 = adequate 2 = poor 3 = very poor	Reliance on rain-fed agriculture 1 = low 2 = medium 3 = high	Floods 1 = infrequent 2 = occasional 3 = frequent	Drought 1 = infrequent 2 = occasional 3 = frequent	Land degradation 1 = minimal 2 = apparent 3 = widespread and problematic	Aquatic alien plants 1 = minimal 2 = prevalent 3 = very prevalent and problematic	Terrestrial alien plants 1 = minimal 2 = prevalent 3 = very prevalent and problematic	Incidence of malaria and waterborne diseases 1 = low 2 = medium 3 = high	Ongoing relevant projects in the site 1 = none 2 = few (1-2) 3 = many (3+)	
Maguga-Mananga	2	2	1	3	2	3	1	3	2	2	21
Mayiwane	2	2	3	2	3	3	1	3	2	1	22
Nkomazi/Malanti	2	2	3	2	1	3	1	3	1	1	20
Nyakaiffo	2	2	3	2	3	3	1	3	2	1	22
Lomati/Mswati II	3	2	3	2	3	3	1	3	2	1	23

**Group 3 (Mbuluzi River Basin) – Scoring sheet**

Site	Vulnerability criteria										TOTAL (out of 30)
	Level of poverty 1 = not very high 2 = high 3 = very high	Access to safe drinking water 1 = adequate 2 = poor 3 = very poor	Reliance on rain-fed agriculture 1 = low 2 = medium 3 = high	Floods 1 = infrequent 2 = occasional 3 = frequent	Drought 1 = infrequent 2 = occasional 3 = frequent	Land degradation 1 = minimal 2 = apparent 3 = widespread and problematic	Aquatic alien plants 1 = minimal 2 = prevalent 3 = very prevalent and problematic	Terrestrial alien plants 1 = minimal 2 = prevalent 3 = very prevalent and problematic	Incidence of malaria and waterborne diseases 1 = low 2 = medium 3 = high	Ongoing relevant projects in the site 1 = none 2 = few (1-2) 3 = many (3+)	
Mlawula NR Dam	1	1	1	3	3	3	2	3	1	2	20
Sand Dam-Kutsumlenti	3	3	3	2	3	3	1	3	1	1	23
IAPs - Dvokolwako	3	3	3	1	3	3	1	3	1	2	23
Cons. Agric – Shewula	3	3	3	1	3	3	1	3	2	3	25
Sand Dam -Shewula	3	3	3	1	3	3	1	3	2	2	24

**Group 4 (Lusitfu & Ngwavuma River Basins) – Scoring sheet**

Site	Vulnerability criteria										TOTAL (out of 30)
	Level of poverty 1 = not very high 2 = high 3 = very high	Access to safe drinking water 1 = adequate 2 = poor 3 = very poor	Reliance on rain-fed agriculture 1 = low 2 = medium 3 = high	Floods 1 = infrequent 2 = occasional 3 = frequent	Drought 1 = infrequent 2 = occasional 3 = frequent	Land degradation 1 = minimal 2 = apparent 3 = widespread and problematic	Aquatic alien plants 1 = minimal 2 = prevalent 3 = very prevalent and problematic	Terrestrial alien plants 1 = minimal 2 = prevalent 3 = very prevalent and problematic	Incidence of malaria and waterborne diseases 1 = low 2 = medium 3 = high	Ongoing relevant projects in the site 1 = none 2 = few (1-2) 3 = many (3+)	
Dam construction Ndanayithini Nkanaka/Lubalini	3	3	3	1	3	3	1	2	3	2	24
LUSIP beyond Nqcampalala	3	3	3	1	3	2	1	2	2	2	22
Keleke earth dam Mankayane	3	3	3	2	1	2	1	2	2	2	21

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Solar driven borehole	2	3	3	1	2	3	1	2	1	2	20
Mantabe (Hurii) climate change Awareness Building (two basins)	3	3	3	2	3	3	1	3	3	2	26
Sigwe/Piungu (Donga Rehab)	3	3	3	2	3	3	1	3	2	1	24



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**ANNEX III: Participants List**

*Adapting to national and trans-boundary water resource management in Swaziland to manage expected climate change*

Inception Workshop – 18 November 2010  
Royal Swazi Convention Centre, Ezulwini

	<b>Name</b>	<b>Institution</b>	<b>Tel/mobile</b>	<b>Email</b>
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8	Rex Brown	SNC	76026448	
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19	Abel Nhleko	MOA: Crop Promotion	505 2851	
20	Mandla Maduna	World Vision International	76131687	

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21	Rodney Hlatshwako	Department of Water Affairs	7622 9838	
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## **Annex 7. Additional details regarding partner projects**

### **Komati Downstream Development Project (KDDP)**

KDDP is an irrigation project underway in the northern semi-arid Lowveld region of Swaziland and implemented by the Swaziland Water and Agricultural Development Enterprise (SWADE), a Government-owned company. It is part of a larger scale project, the Komati Basin Development Project (KBDP), which was started in the early 1980s to control and store part of the peak flows of the Komati River to increase the amount of water available from the Komati River and to provide a reliable source of water for irrigation development in South Africa and Swaziland<sup>149</sup>. Swaziland's share of the KBDP consists of three components (with component 2 being KDDP), namely:

1. The construction of the Maguga dam, estimated to have cost US\$ 170 million, which has been shared on a 60:40 ratio between the governments of South Africa and Swaziland. The dam was completed in 2001 under the supervision of the Komati Basin Water Authority (KOBWA), a bilateral company that was set up in 1993 by the governments of South Africa and Swaziland, under the 1992 Treaty on the Development and Utilization of the Water Resources of the Komati Basin. The Maguga dam is the largest dam in Swaziland with a storage capacity of 332,000 m<sup>3</sup>.
2. The development of 7,400 ha of irrigated farms downstream of the Komati River for the production of sugarcane (5,500 ha) as well as fruits and vegetables (1,900 ha), using water from the Maguga dam. This component forms the KDDP and began in 1999.
3. The expansion of the Mhlume sugar mill to process an additional 80,000 tonnes of sugar annually. The cost of this development will be borne by the private sector.

The overall objective of the KDDP, as the second component of the KBDP, is to alleviate poverty and improve the livelihoods of rural communities by providing irrigation water for farm development. In doing so, the project is helping local smallholder farmers shift from a subsistence agricultural system to the production of cash crops (mainly sugarcane). The KDDP is expected to benefit (directly or indirectly) 20,000 people in an area encompassing over 27,000 ha in the Komati Basin. The project cost is US\$ 78 million and funded by the Governments of South Africa and Swaziland, participating smallholder farmers and the private sector. The farmers' businesses are funded by various institutions such as the Swazi Bank, the Nedbank, the Swaziland Development Finance Corporation (FINCORP) and the Swaziland Industrial Development Company (SIDC).

The KDDP's strategy has four keys points<sup>150</sup>, namely:

1. setting up of smallholder farmer associations, the form and composition of which are decided by the members;
2. designing and implementing measures to mitigate the environmental and social impacts of the project;
3. developing irrigated smallholder farms; and
4. monitoring of the measures intended to mitigate the environmental and social impacts of the scheme.

By 2009, approximately 3,700<sup>151</sup> ha of irrigated sugarcane were planted and 19 smallholder farmers' organisations<sup>152</sup> with an average holding size between 30 ha and 60 ha were established. This has transformed the Swazi sugar industry from one dominated by a small number of large-scale commercial estates to one where more than 1,500 previously impoverished smallholder Swazi farmers have been able

<sup>149</sup>The Swaziland Water and Agricultural Development Enterprise website <http://www.swade.co.sz/kddp.html>.

<sup>150</sup>The Swaziland Water and Agricultural Development Enterprise website <http://www.swade.co.sz/kddp.html>.

<sup>151</sup>The Swaziland Water and Agricultural Development Enterprise website <http://www.swade.co.sz/kddp.html>.

<sup>152</sup>The Swaziland Water and Agricultural Development Enterprise website <http://www.swade.co.sz/kddp.html>.

to enter the industry by joining smallholder farmers' associations and creating communally managed farms. Besides the production of sugarcane, the KDDP has also trained farmers in sustainable land management techniques and the rehabilitation of degraded land, and supports several other economic activities to ensure food security of farmers, such as livestock businesses (feedlots, dairy, poultry and piggeries). A total of 350 ha have been dedicated to diversified agricultural production with 239 homestead garden businesses established<sup>153</sup>. The exit strategy of the KDDP is presently under formulation.

### **Lower Usuthu Smallholder Irrigation Project (LUSIP)**

As with the KDDP, the LUSIP is managed by SWADE with the overall objective to alleviate poverty and improve the livelihoods of rural communities in the Lowveld region of Swaziland. The project is funded by the African Development Bank (AFD), the Arab Bank for Economic Development in Africa (BADEA), the Development Bank of Southern Africa (DBSA), the European Development Fund (EDF) of the European Union (EU), the European Investment Bank (EIB), the International Cooperation and Development Fund (ICDF), the International Fund for Agricultural Development (IFAD) and the GoS. Overall, the project has a budget of US\$ 122 million<sup>154</sup>. The project aims to support the development of water resources in the Lower Usuthu River and to provide irrigation infrastructure and credit facilities to smallholder farmers to encourage intensification and diversification of agricultural production thereby transforming the local economy from subsistence farming into sustainable commercial agriculture.

LUSIP aims to support the development of irrigated farms on 11,500 ha through the construction of three dams to form an off-river reservoir to store water diverted from floods in wet season in the Usuthu River. The project area is located along the west bank of the lower Usuthu River between Siphofaneni and Big Bend. The area is subdivided into five different blocks: the Weir Block at Bulungapoort, the Lubovane North Block, the Lubovane South Block, the St. Philips Block and the Matata Block. LUSIP is divided into two phases. During Phase 1, the first eight years, the project will construct the dams and provide irrigation to 2,600 households to transform 6,500 ha of land currently used for rain-fed subsistence agriculture to irrigated cash crop production (sugarcane, cotton, maize and other high value crops). Phase 2 of the project which will begin after completion of Phase 1 and completed by 2015, will involve the development of an additional 5,000 ha of irrigated land through the extension of irrigation canal system in the Matata area. The beneficiaries of the project will be smallholder farmers involved in the growing of sugarcane, cotton, maize and other high value crops under irrigation.

The project has four main components and objectives, namely<sup>155</sup>:

1. Bulk infrastructure and distribution systems development. The objective is to provide physical infrastructure for the collection, storage and distribution of 155 million m<sup>3</sup> of water per annum to supply the project. The three dams are to be constructed on the Mhlatuzane and the Golome rivers as well as the Saddle dam.
2. Downstream development and agricultural commercialisation. The objective is to develop policy and put in place an institutional mechanism and create a social environment that will facilitate an equitable integration of smallholder irrigation farmers in the project area into commercial economy.
3. Environmental mitigation. The objective is to avoid potential negative impacts of the project through carefully planned resettlement, ecological and environmental health programmes. Under this component comprehensive environmental mitigation plans (CMPs) will be prepared.

<sup>153</sup> The Swaziland Water and Agricultural Development Enterprise website <http://www.swade.co.sz/kddp.html>.

<sup>154</sup> FAO. 2008. From subsistence to sugar-cane monoculture: impacts on agrobiodiversity, local knowledge and food security: a case study of two irrigation and agricultural development project in Swaziland.

<sup>155</sup> <http://www.swade.co.sz/lusip.html>

4. Project co-ordination and management. The objective is to establish processes for effective project management that lay particular emphasis on participatory planning monitoring and evaluation.

Infrastructure development under Phase 1 has been completed (e.g. the Lubovane Reservoir) and they are now planning to develop the irrigation of the 6,500 ha. Phase 1 is to be completed in 2013. It is expected that in 2011 the feasibility studies for Phase 2 will be completed and Phase 2 would start in 2012, and end in 2017. For the phase 1, LUSIP project covers currently 47 farmers associations and 10 water user associations in Phase I.<sup>156</sup>

#### **Lower Usuthu Smallholder Irrigation Project-GEF (LUSIP-GEF) Smallholder Irrigation Project**

The LUSIP-GEF Smallholder Irrigation Project aims to catalyse efforts to overcome the national level barriers to the mainstreaming of Sustainable Land Management (SLM) and improving the legal and policy framework for SLM. The total cost of the project is just under US\$ 11million, 58% of which is funded by the International Fund for Agricultural Development (IFAD), 18% by the Global Environment Facility (GEF), 22% by the GoS and 2% by the beneficiaries. The LUSIP-GEF Smallholder Irrigation Project builds onto the LUSIP project by focusing mainly on the area close to LUSIP, which will remain rain-fed and potentially at risk of exacerbated degradation due to the consequences of the LUSIP. The objectives of the LUSIP-GEF Smallholder Irrigation Project are to reduce land degradation, biodiversity loss and mitigate climate change through the application of SLM practices which will contribute to adaptation to and mitigation of climate change. IFAD is the GEF executing agency and the national implementing partners are MOA and SWADE. The project is expected to run for four years starting in 2011.

The project activities are four components, namely:

- **Component 1: SLM approach promoted at the national level:** This component will promote the development and mainstreaming of a harmonised, cross-sectoral approach to SLM at the national level. The project proposes to set-up an SLM steering committee to: i) inform process of policy and legal development; ii) develop a co-ordinated action plan to promote SLM; iii) contribute to enhancing and restoring land resources.
- **Component 2: Land resources planned and managed sustainably:** This component aims to help local people better plan and manage their land resources. Activities in this component concentrate of raising SLM awareness, skills and ecological literacy of local people. In order to achieve this, capacity building for local level staffs (extension officers/ NGOs/ private sector) will be undertake as well as on-the-ground activities. Main activities are: i) preparation of chiefdom sustainable land management plans; ii) afforestation, reforestation and forest conservation activities; iii) promotion of fuel-efficient stoves; and iv) control of alien invasive plant species.
- **Component 3: Alternative livelihoods promoted:** This component will complement the LUSIP by supporting communities applying SLM and conservation measures to generate additional sources of income to alleviate poverty and reduce pressure on natural resources. Alternative livelihoods likely to be promoted are among others: i) production of forage crops; ii) milk production; iii) bee keeping and iv) eco-tourism.
- **Component 4: Project management:** Establishment of the project management structures and projects results dissemination networks.

<sup>156</sup> Information obtained during the meeting between the consultants and the SWADE-LUSIP team on the 6<sup>th</sup> December 2010. (See Annex 5).

## **Annex 8. Examples of techniques to harvest rainwater and improve rainwater infiltration rates**

### **Rainwater harvesting**

Rainwater has been harvested by communities throughout time, but is increasingly becoming a more important climate change adaptation measure<sup>157</sup>. As the name suggests, rainwater harvesting is the practice of collecting rainwater and storing it for later use. Commonly used systems comprise three principal components, namely: i) the catchment area (rooftops and land surfaces); ii) the conveyance systems (plastic or corrugated iron gutters); and iii) the collection device (storage tanks). The advantages of rainwater harvesting include: i) it provides self sufficiency to water supply; ii) it provides high quality water, with a low mineral content; iii) it is a relatively inexpensive system which can be adopted by individuals; and iv) in the hilly terrain, rainwater harvesting is the easiest method of water collection. The feasibility of rainwater harvesting is highly dependent upon the amount and intensity of rainfall in an area and variables such as catchment area, catchment imperviousness ratio and opportunities for reuse also influence this decision. The efficiency of collection and storage methods and timing with regard to the hydrological cycle (collection system in place prior to the wet season) are important factors in the effectiveness of rainwater harvesting as a water supply. Rainwater harvesting is a desirable option for rural communities particularly as rainwater is a free commodity and it requires minimal treatment and needs little if any reticulation systems. In addition, rainwater harvesting has the potential to reduce the amount of damage caused by particularly heavy rainfall, such as erosion, flooding and landslides.

A study aimed at interpreting the viability of rainwater harvesting as a rural water supply in Swaziland was conducted in the Mpaka community, in the Lowveld region<sup>158</sup>. Most of the households in village practiced rainwater harvesting, but only few had sufficient storage capacity to collect enough water to provide a year-round supply. Of those harvesting rainwater, only 8% collected a sufficient volume to act as a sustained supply, whilst the remaining 92% had to rely on other sources in addition to the harvested rainwater. Those collecting sufficient water had 10,000L tanks. The most common size of tank was in the 100 – 300L range (33% of households surveyed). The study concluded that there was a desire for PVC gutter and storage tanks in the village, but these were too expensive for the community members to afford.

A study from India, where government has passed legislation stating that no houses can be built without the capacity to harvest rainwater, found that ferro-cement was the most advantageous material to use for building storage tanks<sup>159</sup>. Ferro-cement is strong, versatile, low-cost, long-lasting building material made from a wire reinforced mixture of sand, water, and cement. Advantages of these storage tanks include: i) the walls are thin, light, and easy for transportation; ii) no skilled labour is required for construction; iii) they have a high degree of impermeability and resistance to cracking; iv) they require little or no maintenance at all; v) they are economical compared to tanks of steel, concrete or brick; and vi) tanks can be of any size and shape (rectangular/circular).

Rainwater harvesting is a decentralized alternative to ecologically damaging, socially intrusive and capital-intensive water management projects, and if collected and stored efficiently, rainwater can form

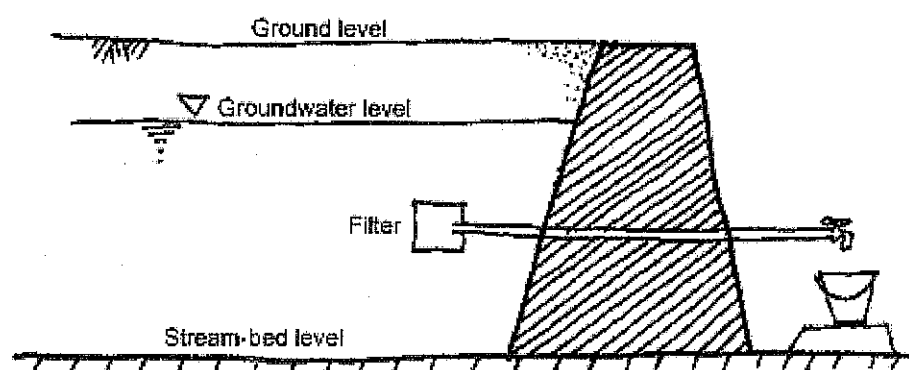
<sup>157</sup>Pandey, D.N., Gupta, A.K. & Anderson, D.M. 2003. Rainwater harvesting as an adaptation to climate change. *Current Science* 85(1): 46 – 59.

<sup>158</sup>Singwane, S.S. & Kunene, S.G. 2010. Viability of rainwater harvesting in supplying domestic water in rural areas of Swaziland: a case of Mpaka community. *Journal of Sustainable Development in Africa* 12 (2): 96 – 109.

<sup>159</sup>Singh, L.M. 2006. Completion Report of the Pilot Project on Rain Water Harvesting in Manipur. Submitted to: Director, Science and Society Division (SSD), Department of Science and Technology (DST), Govt. of India. <http://mastec.nic.in/MASTEC/Report%20Rain%20Water%20Harvesting.pdf>.

an adequate and sustained water supply, particularly to rural communities.

Another form of rainwater harvesting is storing the water underground in sand and sub-surface dams, which limits losses via evaporation. **Sand dams** are a relatively simple, inexpensive and low maintenance rainwater harvesting technique. They are developed by gradually building a wedge-shaped concrete wall (1 - 5 m high) with foundations on impermeable rock in the upper or middle courses of seasonal sandy river valleys. When it rains and the river flows, the dam captures soil-laden water behind it and the soil sinks to the bottom. This results in sand being trapped behind the wall and water is stored in the deposited sand. Approximately 1 – 3% of rainwater is retained behind any individual dam whilst the remainder continues on its course, meaning there are little to no downstream impacts related to excess water abstraction<sup>160</sup>. Eventually the dam fills with sand, which contains a high quantity of water. The water can then be extracted by either digging a hole in the sand and thus allowing the water to come to the surface or by inserting a pipe through the wall of the dam (as shown in the figure below).



### Artificially increasing rainwater infiltration

The natural replenishment of groundwater occurs very slowly. If groundwater is exploited at a rate greater than that of its natural replenishment, groundwater levels will decline and, in the long term, groundwater may become unusable. Artificial rainwater infiltration aims at augmentation of groundwater reservoirs and aquifer recharge by modifying the natural movement of surface water utilising engineered systems. This has become an important technique due to variability in season rainfall and increase in extreme events, meaning increased run-off and decreased infiltration.

Artificial rainwater infiltration has the following advantages<sup>161</sup>: i) enhancement of the sustainable yield in areas where aquifers have been depleted; ii) conservation and storage of excess surface water for future requirements, since these requirements often changes within a season or a period; iii) improvement in the quality of existing groundwater through dilution; and iv) removal of bacteriological and other impurities from sewage and waste water so that water is suitable for re-use.

The basic purpose of artificial recharge of groundwater is to restore supplies from aquifers depleted due to excessive groundwater development. Infiltration and artificial recharge are achieved by three principle techniques each with their own intricacies<sup>162</sup>: i) over-irrigating, ponding or flowing water or on the soil

<sup>160</sup>Hut, R., Ertzen, M., Joeman, N., Vergeer, N., Winsemius, H & van de Giesen, N.2008.Effects of sand storage dams on groundwater levels with examples from Kenya.*Physics and Chemistry of the Earth* 33(1-2): 56 – 66.

<sup>161</sup>Ministry of Water Resources: Central Groundwater Board, 2000. Guide on Artificial Recharge to Groundwater. New Delhi.

<sup>162</sup>Bouwer, H. 2002. Artificial recharge of groundwater: hydrogeology and engineering. *Hydrogeology Journal* 10: 121 – 142.

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surface with basins, furrows or ditches; ii) placing the surface water in infiltration trenches, shafts, or wells in the unsaturated (vadose) zone; or iii) inserting the water in wells for direct injection into the aquifer. The different techniques are used in response to site-specific geo-hydrological conditions, and can yield excellent recharge results.

Flooding: A very effective method that requires certain hydro-geological circumstances that allow surplus water to move over large areas for sufficient periods of time to allow it to penetrate the groundwater body. Best for gently sloping land with few gullies.

Ditches and Furrows: Used for areas with varied topography, equally spaced shallow ditches maximise the water contact area for recharge.

Recharge Basins: The basins are excavated or enclosed by dykes and levees and should be built parallel to stream channels. This uses space efficiently and increases the water contact area significantly.

Run-off conservation structures: For areas receiving low rainfall and cannot be re-supplied by transferred water, extra conservation is required, such as:

- *Gully Plugs*: Small structures that plug small streams and gullies from small catchments during rainy season.
- *Bench terracing*: Bench terraces are a series of level or virtually level strips running across the slope at vertical intervals, supported by steep banks or risers. They minimize erosion and reduce run-off.
- *Contour Barriers*: This involves putting up barriers on sloped ground along contours of equal elevation thus trapping the rain and building up moisture storage

Other forms of rainwater infiltration include natural, enhanced, induced, and incidental recharge. Restoration of natural ecosystems improves aquifer recharge, particularly the restoration of degraded wetlands. Healthy ecosystems facilitate the infiltration of surface water to aquifers by preventing run-off, thus maintaining groundwater base flow in dry periods, and controlling floods and erosion in the wet season.



## **Annex 9. Field visit report**

### **1. BACKGROUND AND INTRODUCTION**

The purpose of the site meetings was to: i) discuss climate change issues; ii) gain a better appreciation of the vulnerability of the communities and river basins; and iii) identify suitable adaptation interventions in consultation with the beneficiary communities. Communities were identified in each of the river basins during the inception workshop held on the 18<sup>th</sup> November 2010. The National Consultant was required to undertake a follow-up investigation of the sites.

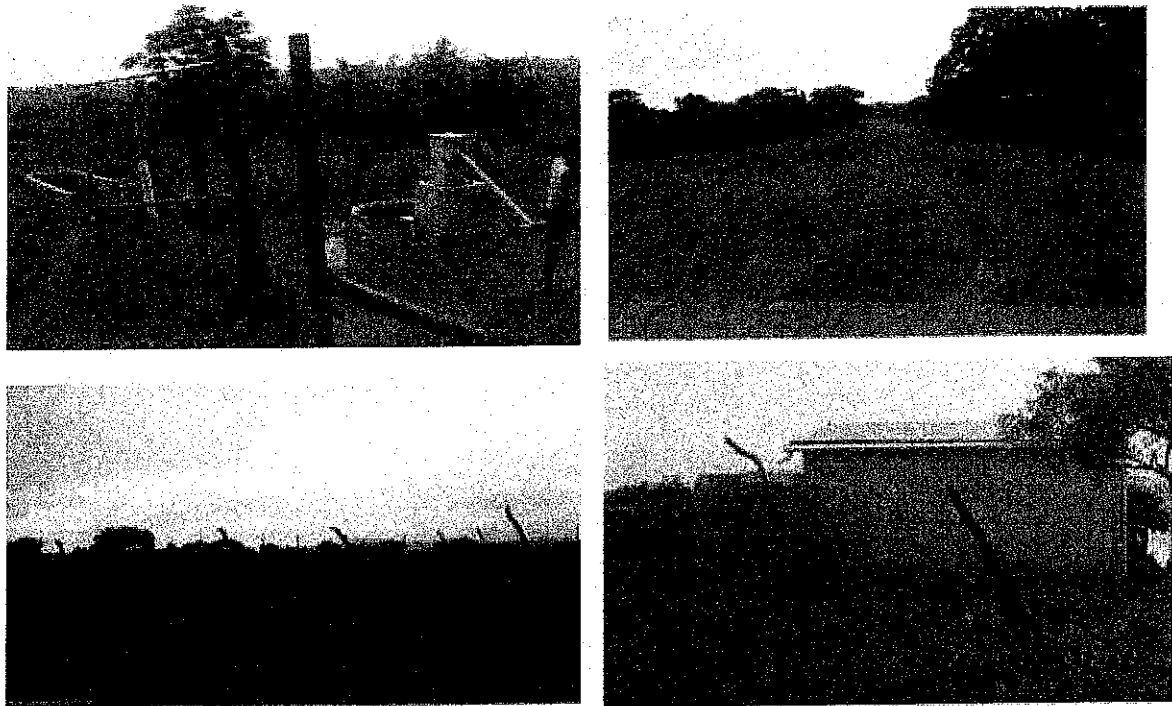
The process started with the National Consultant: i) visiting all the sites; ii) undertaking a preliminary evaluation of the sites; and iii) identifying community leaders and setting appointments for the meetings. For the basin stakeholders this entailed meeting some key people in the basin institutions, and establishing the appointments after undertaking a preliminary investigation of the site.

During the preliminary investigation it was found that:

- Mayiwane, Nyakatfo and Mvembili areas near Mswati II High School revealed that there were insufficient climate change adaptation interventions that could be readily established within the context of this SCCF programme. Nyakatfo was investigated to assess soil erosion issues, as proposed in the inception workshop, however, upon inspection land degradation was not found to be a major problem in this area.
- Mayiwane and Mvembili have baseline development issues that need to be addressed rather than climate change vulnerabilities. It has transpired that Government is building a big earth dam at Mayiwane, which is also provide a source of irrigation water for land in the area.
- In general, Mvembili has a potable water supply issue. A rural water supply scheme was developed some time ago but the community either could not afford it or was not well enough coordinated to generate money for pumping the water. Some options for gravity sources were explored, and there are some identified strategic sources. Besides at Mvembili, the area is generally well endowed with water. This appeared more of a development issue than a climate change adaptation concern.

Two other sites were identified but meetings could not be held due to late cancellations by the communities. These were in the Siphofaneni Irrigation District and with the Ndunayithini Community. However, the National Consultant visited these places and conducted some preliminary investigations. Siphofaneni's interests could be assumed to be covered through interventions in relation to the LUSIP.

Preliminary investigations at Ndunayithini indicated that the community is generally vulnerable to climate change impacts. It has a general domestic water supply problem in some areas, with some community members having to draw water from the Ngwavuma River using oxen and donkeys. There are community boreholes and evidence of rainwater harvesting (water tanks). Some of the issues are similar to those raised by the Ngwavuma RBA in the meeting reported on below.



**Figure 1: Pictures from Ndunayithini and surrounding areas.**

The findings from the sites where site meetings were held are discussed below in greater detail. The site meetings were facilitated by Mr. Dumsani Mndzebele (National Consultant), Ms. Sarah Fox (International Consultant) and the communities. Annex I presents the list of attendance of meeting participants at the stakeholder meetings. Annex II is an example of the form that was completed to assess the vulnerability of the communities.

## **2. SITE INVESTIGATIONS**

### **2.1. Mkhiweni Inkhundla (Ekutsimuleni, Dvokolwako and Mbelebeleni)**

#### **2.1.1. Site Description**

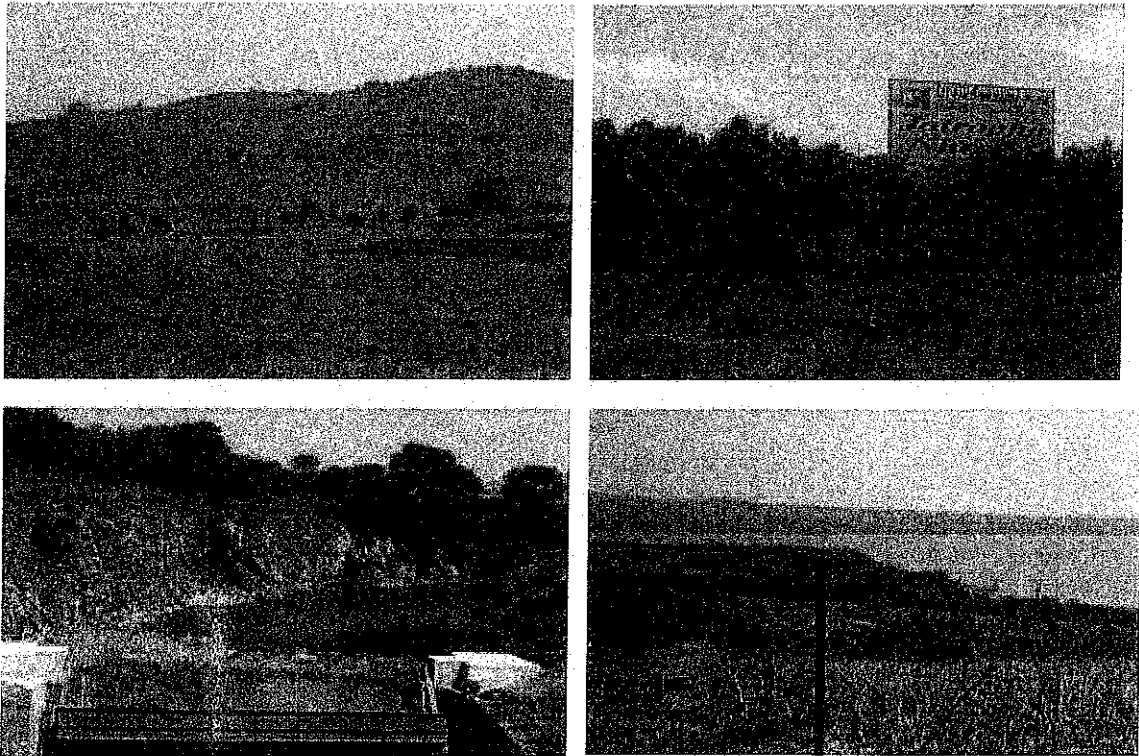
Mkhiweni is an Inkhundla with three Chiefdoms, namely Dvolwako, Ekutsimuleni and Mbelebeleni. This Inkhundla is situated in the Mbuluzi River Basin. Dvokolwako and Mbelebeleni are situated near the Black Mbuluzi section of the basin while Kutsimuleni is situated in-between the Black Mbuluzi and Mbuluzane arms of the basin.

Catchment characteristics of the Mbuluzi Basin include some afforestation in the highveld, savannah vegetation in the middle and lowveld, and sugarcane plantations and nature conservation in the lower east part of the basin. Rainfall is high in the mountainous highveld (up to 1,500 mm in some areas) and there are resultant soil erosion issues. Soil erosion is also evident in the middleveld areas of Mbelebeleni and Kutsimuleni. Major land-use problems include unsustainable livestock grazing and land ploughing. Farming is largely subsistence, which is rain-fed. The Mnjoli Dam is the largest in the basin and is situated in the lower Dvokolwako. The dam is primarily surrounded by intensive commercial sugarcane

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farms, although there are other crops such as *Jatropha*. Further downstream in the basin (beyond the boundaries of this Inkhundla) there are a number of conservation areas that border with Mozambique.

There are a number of issues in the basin, both non-climate and climate change related.



**Figure 2: Characteristics of the Mbuluzi River Basin.**

### **2.1.2. Vulnerability Assessment**

Discussions were held with the community stakeholders from the three chiefdoms. The purpose was to: i) understand the climate change issues affecting the basin; ii) assess how the communities have coped with these issues; and iii) identify intervention actions that could to assist the communities to adapt to these challenges.

Natural resources of importance in the communities include marula trees, trees for firewood collection and building homes, grass for roof thatching (although now severely threatened by drought) and wetlands. Cattle are a valuable asset, but the grazing lands are threatened by climate change related impacts and an increase in the number of and the extent of homesteads. Water sources for the communities include rainwater harvesting using tanks, springs, the Mbuluzi River and groundwater wells. Some of the streams are seasonal and at times communities have to dig into the river beds to reach the water. Waterborne diseases do occur, but infrequently. Household gardens (for growing vegetables) are few due to the lack of a reliable water supply and those that do exist are usually near rivers or other water sources.

Ongoing initiatives in the communities that have helped with sustainability include a Government Business Awareness Programme. This has empowered some community members who have created employment for themselves by opening stores, through poultry production and by selling garden produce

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at the market. There are small sugarcane businesses in some of the downstream areas such as at Dvokolwako.

Although the impacts of climate change could be over-shadowed by non-climate related issues, such as an increase in population, general community growth and poor land-use management practices such as over-grazing, evidence of climate change has been seen by the communities. This has been primarily through a delay in the onset of seasonal rains. When rain falls, it is said to be in short, intense bursts. The area also used to be very grassy, but now alien invasive plants have become more dominant, impacting all communities.

The impacts of flooding are not as severe as those of droughts; the largest memorable flood event that had a severe impact was in 1984 due to Cyclone Domoina. Although extreme flood events are not often experienced, swollen rivers due to intense rainfall events cause land degradation through erosion and deposit silt in fields and in downstream regions of the rivers. Even private land that has not been over-grazed has been eroded in this manner.

Another challenge faced by the communities is the invasion of termites, which cause problems in crop fields and at homesteads. Additionally, grain weevils ruin maize both in the fields and at intermediate storage bins, before the maize is shelled and stored in metallic tanks.

To cope the communities have had to switch over to more resilient types of seed, as those traditionally used were not productive in the unpredictable rainfall. Even drought resilient crops such as sorghum and legumes have not survived through some of the experienced droughts, affecting subsistence farmers. The close-knit and giving nature of neighbouring communities has helped in trying times, with those with better harvests often sharing their produce with those more severely affected by poor yields, or selling to them at a more reasonable price. Government has also assisted through the provision of food aid to struggling communities. Government's support to orphans and vulnerable children has also assured that they continue to attend school.

Meeting participants were each requested to fill out a vulnerability assessment form. The results are shown below in Figure 3.

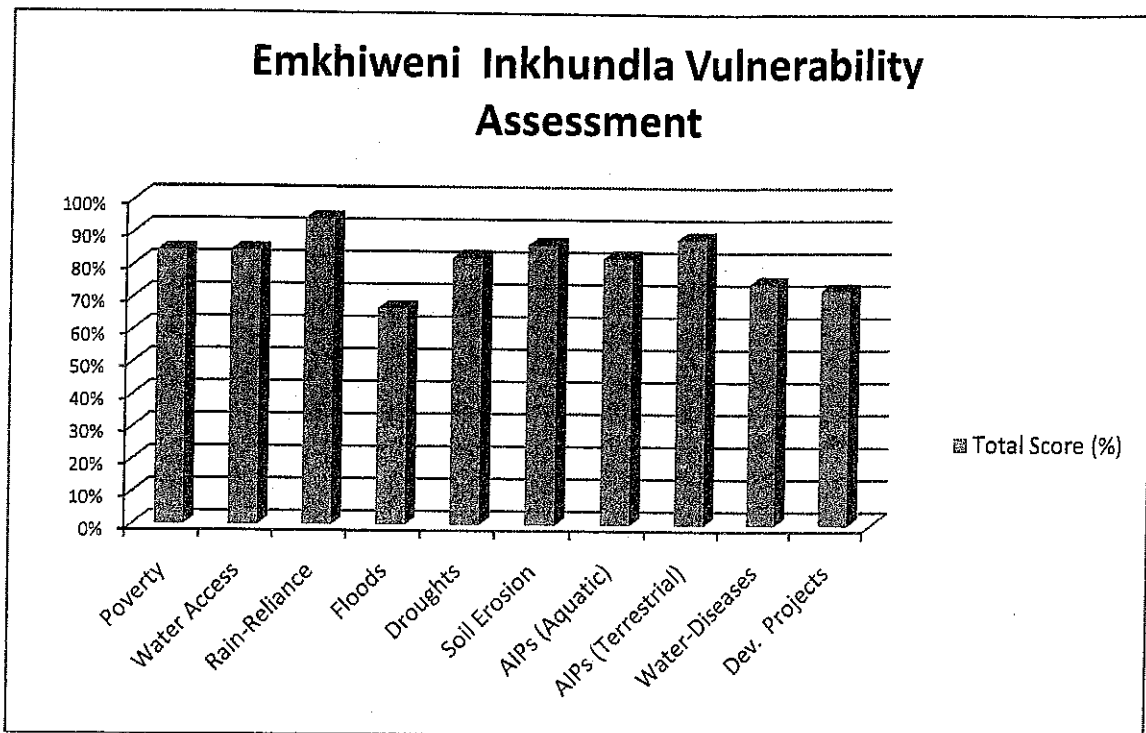


Figure 3: Emkhiweni Inkhundla vulnerability Assessment results.

### 2.1.3. Proposed Adaptation Interventions and Ranking

The communities identified several interventions to address the discussed issues. These were ranked according to their importance, the first intervention seen to be the most important:

#### a. Water supply for all communities

There is a clear need for strategic interventions to secure both a potable water supply and a supply for back-yard gardening. There was a general consensus that the best source would be tributary of the Black Mbuluzi River. Unfortunately, this was beyond the scope of the present project, therefore those in attendance at the meeting agreed to resort to the 2<sup>nd</sup> priority intervention as the next best option.

#### b. Water tanks and increasing the capacity to build rainwater harvesting tanks

This intervention would ideally be in addition to the adaptation measure above. Plastic water tanks could be provided as an interim measure, but educating communities on how to build more durable, permanent storage facilities to harvest rainwater would be very beneficial.

#### c. Clearing of alien invasive plants – hiring and using local people

This intervention was noted as being needed by the communities. However, a more sustainable approach is required than has been previously used as re-growth of the plants has been observed in areas that were cleared in the past. The communities also expressed an interest in ensuring the employment of locals to clear the alien invasive plants, unlike what has happened in the past. After consulting the Forestry Department in the Ministry of Tourism and Environmental Affairs, it has transpired that this is the model that will be pursued by Government in future. Uprooting the alien invasive plants is an option, but this tends to leave the soil exposed and vulnerable to erosion. The use of chemicals is another option.

It would seem that fighting the alien invasive plants has and will be a persistent challenge. However, could the opportunity of demonstrating a more sustainable approach was discussed. Invaded areas could be replaced with more productive indigenous plants that could be used to meet the community's needs, in a reforestation project. This could be coupled with a maintenance programme to ensure that there is no re-growth of the alien invasive plants, or spread from other areas.

The severe invasion of guava plants at Mbelebeni was highlighted. This could potentially be an opportunity for a demonstration plot/site in this area. Further opportunity sites exist at Dvokolwako (and Kutsimuleni), where Government is constructing earth dams. This indigenous forestry initiative could therefore be linked to general catchment management.

**d. Soil conservation, due to land degradation and increased silt loads**

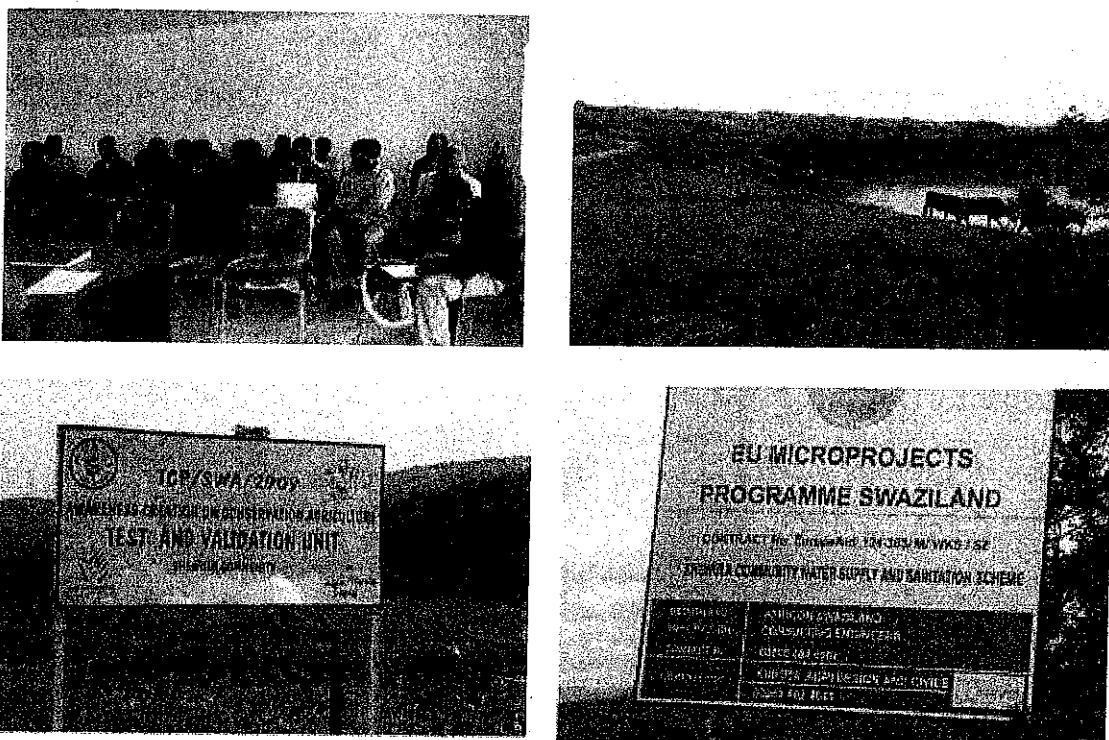
Several areas in the Inkhundla have soil erosion problems, and Mbelebeni was once again highlighted. If an appropriate site can be identified in the vicinity of a reforestation initiative, this could also be an opportunity to combine this aspect as part of a wider demonstration.

**2.2. Ka-Shewula**

**2.2.1. Site Description**

Ka-Shewula lies in the eastern part of the country at the border with Mozambique, in the elevated Lubombo Mountain region. Like the south west highveld and the middleveld, the Lubombo region is classified as being in the moderate drought risk zone, with an annual rainfall ranging from 700-1200 mm. As a result its location Lubombo Mountains, Ka-Shewula could be expected to have less water supply challenges than other areas. However, the geographic location and conditions are such that the area is far from services and generally has limited storage facilities with very few streams. The Lubombo region is classified as one of the most vulnerable in the country from a poverty perspective and Ka-Shewula is characterized by high levels of poverty. Government, ICPs and NGOs have invested efforts to try to improve the living conditions of the community, with significant improvement as a result in some areas. Water supply, however, remains a serious challenge.

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**Figure 4: Some pictures from Kwa-Shewula community.**

Below is a summary of the points raised by the community at a meeting held to assess the vulnerability of the community.

### **2.2.2. Vulnerability Assessment**

The main sources of water for this area are the Mbuluzi River, four boreholes, springs, and rainwater harvesting from rooftops. Some community members still fetch water from smaller rivers, and springs are becoming more seasonal, with variations in the seasonal rainfall.

Projects taking place include a sanitation programme by World Vision International, HIV/AIDS programmes, handicraft projects involving women, backyard garden projects and there is a joint community saving scheme loaning money to its members.

The main problems in the area are the drying up of boreholes and poor water quality. Food shortage due to unreliable rainfall is another challenge. Generally speaking, during the summer season water is available, but in winter many springs dry up (about 50% of the available springs), and water storage is required. Cases of waterborne diseases have been reported. The land has lost much of its fertility and the community now relies on the use of fertilizers. The loss of fertility could be attributed to heavy rains and the leaching of nutrients from the soil.

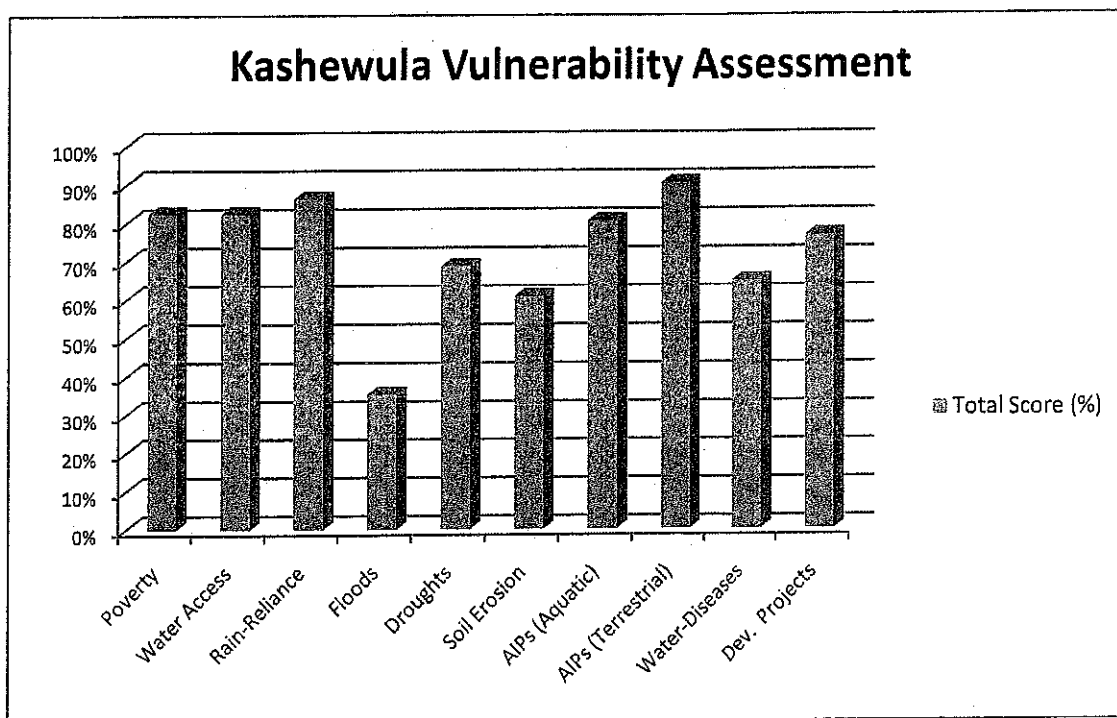
Climate variability and change have had a great impact on agricultural production. The rainfall season is characterized by a late onset and early cessation, although cumulative rainfall in some parts of the country is often sufficient to sustain crop growth when planting is done in time (Swazi VAC, 2009). As a result of the observed changes, the planting season has shifted, and planting now takes place later in the year and

the period of planting is shorter due to short duration of the rainy season. In addition, the availability of natural fruits has reduced. This is potentially evidence of the impacts of climate change.

Alien invasive plants have reduced the size of the land available for grazing and food production, and of thatching grass. There is a desire to remove the alien invasive plants but limited financial resources pose a challenge.

To assist the community, Government sends water tankers with rationed potable water, thatching grass is imported from Mozambique and food aid is provided. In extreme cases, livestock are sent to Mbuluzi for drinking purposes to prevent loss of livestock, and grass for thatching is sourced there. Borrow pits are provided along the road by road constructors which act as water harvesting storage facilities for livestock to drink from.

Meeting participants were each requested to fill out a vulnerability assessment form. The results are shown below in Figure 5.



**Figure 5: Ka-Shewula vulnerability assessment results.**

### **2.2.3. Proposed Adaptation Interventions and Ranking**

The community identified several interventions to address the discussed issues. These were ranked according to their importance, the first intervention seen to be the most important:

**a. Potable water supply (although this is outside the scope of this project we acknowledged it as important)**

An EU Micro-Project initiative has been implemented to provide sustainable potable water supply for the community using groundwater sources. Groundwater is the generally favoured rural supply source in the country due to the minimal treatment that is required. A total of twenty boreholes were drilled in 2007 but



only nine contained water. By 2010, five of these were dry. This clearly indicates that groundwater is not a sustainable solution for water supply to this community. The community is therefore now exploring more avenues for sustainable water supply, hence its ranking as the number one priority intervention as an adaptation measure to the impacts of drought. Talks are ongoing with Government and World Vision International to see if a partnership can be forged to assist with this intervention.

**b. Earth dams/rainwater harvesting – for irrigated vegetable production**

This intervention aims to provide water tanks for rainwater harvesting to the community, as well as at least one earth dam which could be used for a number of purposes such as domestic water supply, livestock watering and community garden irrigation. An indirect benefit of this would potentially be the enhancement of rainwater infiltration of aquifers in the vicinity.

It appears that in early 2011 Government is considering a feasibility study for earth dams in the area. However, construction is not likely in the near future. Nonetheless this could be an opportunity for the present project to make use of the study results, to take this work forward and provide at least one earth dam for the community.

**c. Providing tractors services closer to the community**

The use of livestock for major agricultural work has reduced over time due to livestock decline as result of the unpredictable rainfall and availability of water. The use of tractors has therefore increased. However, Government's tractors are based far away at Esitsatsaweni, which presents a challenge. By the time the tractors reach where they are required the moisture from the rainfall has dried and the opportunity is lost. There is therefore a need to improve assurance of the timely availability of tractors in this area.

Several options could be explored. One is to try and reason with Government to establish an RBA closer to the area. However, this is unlikely given Government's limited resources and staffing. Another alternative is to capacitate some nearby private tractor providers to increase their fleet to better service the community.

**d. Organic farming**

Organic farming is another intervention that was proposed. It is largely about use of organic fertilizers to enrich nutrients in the soil. This could be combined with an intensive awareness programme to facilitate adoption of this technique at a wider scale. There is a related conservation farming (no tiling) programme being piloted by the Ministry of Agriculture in a slightly different area. The organic farming initiative could be linked to this programme considering the level of readiness of the community to try new techniques to farming.

**2.3. Komati River Basin**

**2.3.1. Site Description**

The Komati River Basin is one of the five major river basins in the country. Together with the Lomati River Basin, the Komati forms the Incomati River Basin which includes areas of South Africa. KOBWA is the RBA overseeing joint water resources development in the basin. A major project of KOBWA was the development of two big dams in the Incomati River Basin, i.e. the Maguga Dam (on the Komati River) and the Driekoppies Dam (in the Lomati River Basin). KOBWA reports to the JWC responsible for the management of the two systems shared between Swaziland and South Africa. SWADE is responsible for the downstream development work within Swaziland, to assist the benefitting communities to make productive use of the developed water resources allocated to Swaziland.

The Water Act of 2003 established RBAs in the five major river basins in the country. The Water Act also provides for the establishment of Water User Districts (or Irrigation Districts) which are essentially groupings of several Water User Associations within a defined geographic area. One Water User District has already been established in the Komati River Basin, i.e. Emandla Ekuphila. Like the RBA, it is a relatively young institution with many capacity issues.

Basin characteristics include upstream dam infrastructure, a game reserve where the river enters Swaziland, exotic forestry around Pigg's Peak, grazing lands in highveld and middleveld, a large area (thousands of hectares) of sugarcane, and citrus fruit plantations at the border with South Africa. Several tributaries join the Komati River and there are a number of bridges, some of them low-level bridges that are inundated under flood conditions. There are also some issues with land degradation within the basin.

Below is a summary of the points raised by the community at a meeting held to assess the vulnerability of the community.

### **2.3.2. Vulnerability Assessment**

Water sources in the basin consist of the Komati River, a number of tributaries, springs and wells, rainwater tanks and potable water supply schemes, such as the community supply scheme developed by SWADE (through the KDDP initiative). Natural resources of importance include marula trees, some wetlands and some natural fruits. SWADE plans to establish a nursery for indigenous plants in the area.

The biggest water problem is lack of availability in times of drought. Even after over-spilling of Maguga Dam, rationing has to be enforced, and drought affects the rain-fed maize industry. Although flooding is not a major concern in the basin, farmers have not yet overcome the problem of drowning water pumps in the Komati River during the wet season and water-logged sugarcane fields making harvests difficult to haul. Land degradation is evident in some parts of the basin.

Management of the Komati water system is relatively participatory. KOBWA periodically updates farmers on the water status, projected situations and proposed responses in terms of allocation and rationing measures if need be. A monthly KJOF exists and draws the representation of basin stakeholder institutions and the Departments of Water Affairs in South Africa and Swaziland for this purpose. There is a basin flood management plan (developed with the facilitation of KOBWA) that the RBA can adopt or adapt as it considers a greater basin management plan. The plan has already been tested to some extent; however there is a need to ensure that water users can respond timely in a flood crisis situation.

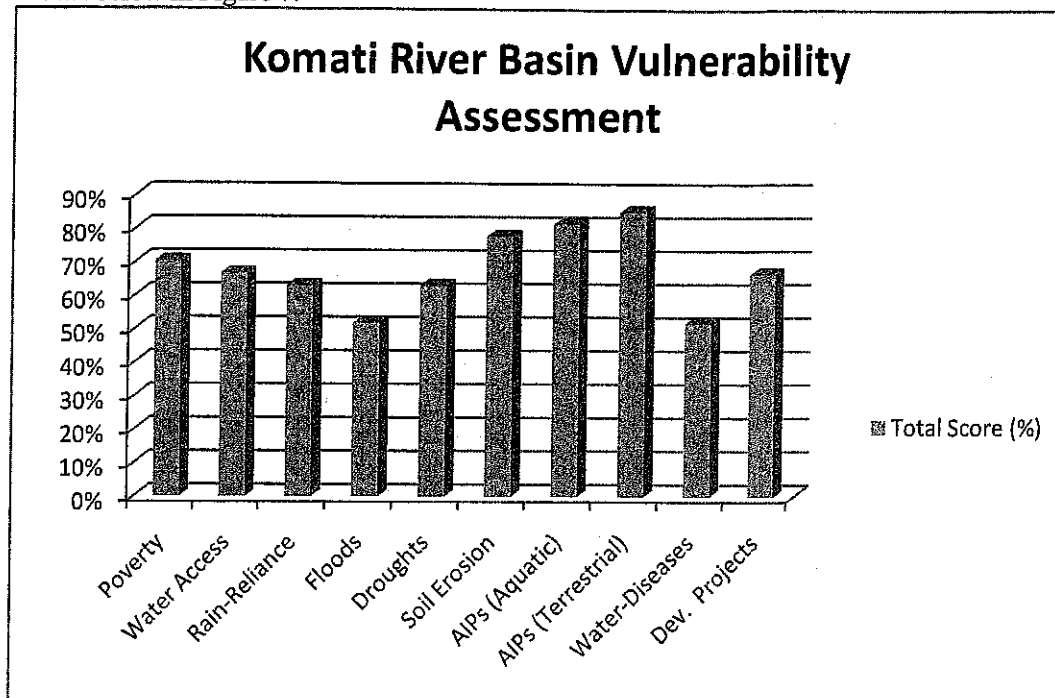
There are a number of initiatives in the basin implemented by KOBWA, SWADE and Government, i.e. alien invasive plants are removed by Government through the Tinkhundla centres. KOBWA is also working with schools to create capacity in sustainable water management and in other environmental sectors. They have recently introduced climate change awareness as part of this programme; however funding support is required for expansion.

A preliminary analysis of hydrological information by the resource managers indicate cycles of 10 years for droughts and flood recurrence in the basin. However, there is need for further studies/analyses to better understand the pattern, particularly in relation to the influence of climate change.

As way of coping most homesteads in the basin have introduced rainwater tanks. The sugarcane farmers have the challenge of haulage trucks and machinery accessing fields and so manual labour is being introduced. Farmers are also considering revising planting cycles such that the sugarcane ripens outside the rainy season. SWADE has assisted in diversifying activities for the communities in the basin, i.e.

mushroom production, indigenous chicken, cow and goat farming, helping farmers access markets, and the introduction of a fisheries industry in places.

Meeting participants were each requested to fill out a vulnerability assessment form. The results are shown below in Figure 7.



**Figure 7: Komati River Basin vulnerability assessment results**

### **2.3.3. Proposed Adaptation Interventions and Ranking**

The community identified several interventions to address the discussed issues. These were ranked according to their importance, the first intervention seen to be the most important:

**a. Institutional capacity building of Water User Districts (e.g. Emandla Ekuphila) to implement climate change adaptation strategies**

This intervention aims at capacitating Water User Districts to implement climate change adaptation strategies for the basin. This would entail awareness-raising of what climate change is and its potential impacts in the basin, and training on how to integrate climate change adaptation into the activities of daily life. The stakeholders also highlighted the need for training on Water Demand Management under climate change situations. This could be an opportunity for training on IWRM, Water Demand Management and Trans-boundary Water Resource Management with climate change in mind. It was noted that some small-scale farmers still need training other areas, such as irrigation scheduling.

**b. Hydro-meteorological and water use information gathering**

This intervention is meant to advance the level of availability of water-related information, to enhance water resource planning and systems operations in the basin. It looks at making use of schools and community structures to expand the network of rainfall measurements and collecting hydrological and hydro-geological information. The schools and communities would be educated on the importance of and

how to collect the required information, be given some equipment for this purpose (e.g. rain gauges) and be capacitated to disseminate or share such information.

**c. Foster collaboration in removing alien invasive plants**

This intervention will entail establishment of partnership arrangements between NGOs, Government institutions, the RBA and Water User Districts. It was indicated that there are some ongoing initiatives in the basin aimed at the removal of alien invasive plants. The RBA and Water User Districts would be trained on the identification and removal of these plants, and collaborative efforts enhanced.

**d. Awareness campaign on water and climate change**

This intervention would entail awareness-raising amongst water users and communities on water resource management and utilization issues; and adaptation to climate change. It was mentioned that some communities were not even aware of the water scarcity challenges in the basin.

**2.4. Ngwavuma River Basin**

**2.4.1. Site Description**

The Ngwavuma River Basin is located in the southern part of the country and is characterized by a variety of climatic conditions. Upstream the basin is wet and has a large forest plantation (the Shiselweni Forest). Here, communities are generally able to undertake rain-fed crop production and livestock production is good. Due to the wet nature of the region, however, soil erosion is an issue.

The middle portion of the basin is transitional with the savannah type vegetation intensifying. Rain-fed agriculture is challenging, however cattle production is still good. The major challenge is over-grazing.

The lower portion of the basin is characterized by dry conditions and very little rain-fed agriculture. There are major sugarcane producers and some game farming activities. This is where most of the basin water is utilized. Livestock suffer from a lack of available water and dry conditions; however the communities still see the livestock as their main means of survival.

**2.4.2. Vulnerability Assessment**

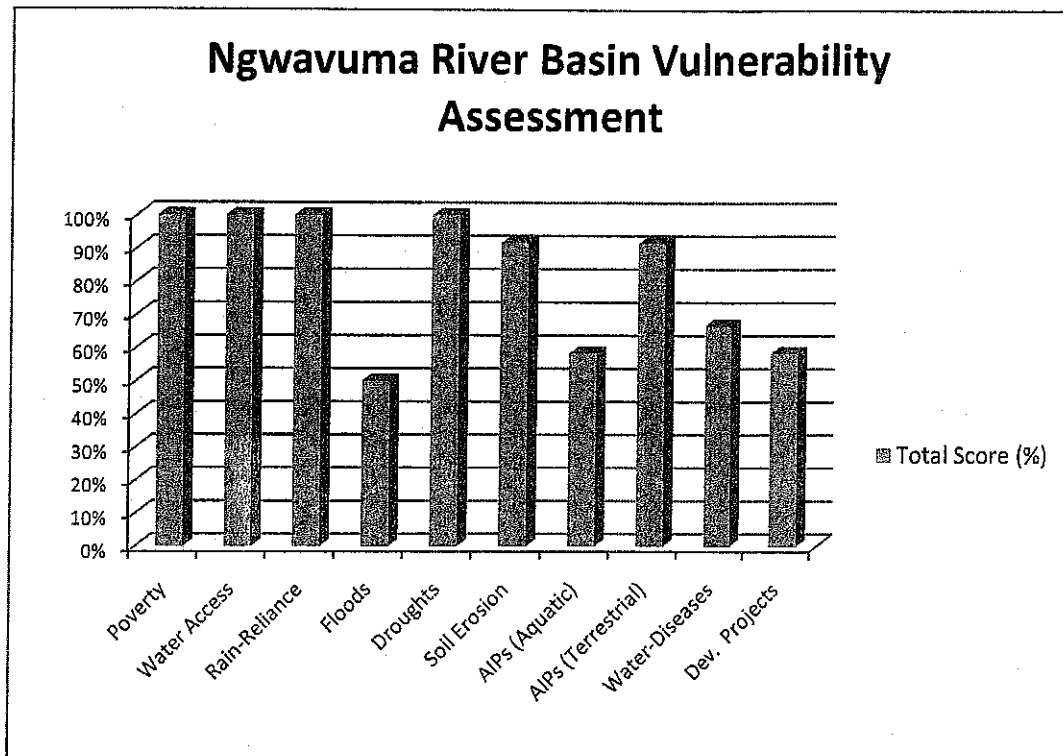
Water sources in the basin include Ngwavuma River, boreholes, rain water harvesting and earth dams. National resources of importance in the basin include some springs and wetlands in the upstream region of the basin, coal which is mined and exported to South Africa and natural woodlands/forests (although threatened by dry conditions and over-grazing). The most productive assets are cattle and goats which the families tend to sell to survive, particularly in those areas that are characterized by dry conditions.

To capture water weirs, canals and off-stream earth dams have been constructed and rainwater harvesting tanks are used. Droughts were previously cyclical over a number of years but recent trends have shown an annual occurrence. The level of deforestation and soil erosion is severe across the whole basin. In general the main problems in the basin include high siltation level, over-grazed lands, infrequent river flows, drought and highly saline boreholes.

The impacts of climate change are clearly evident in the reduced agricultural production. Subsistence rain-fed farming has become almost non-existent in the lower parts of the basin and there has been a change in the rainfall pattern, with harder rainfall when it occurs.

To cope with this situation commercial farmers have increased off-stream water storage facilities. They have also had to introduce more efficient irrigation systems such as sprinkler and centre-pivot techniques. Communities have not adapted as well. Government has provided groundwater schemes for some communities; however these are hampered by drying wells and high salinity levels in many instances. Some communities buy water from vendors who use tankers or small containers. Grazing lands are generally dry and this has significantly reduced the number of livestock in the lower parts of the basin. Here, communities rely on farmers for the provision of water.

Meeting participants were each requested to fill out a vulnerability assessment form. The results are shown below in Figure 8.



**Figure 8: Ngwavuma River Basin vulnerability assessment results**

### **2.4.3. Proposed Adaptation Interventions and Ranking**

The community identified several interventions to address the discussed issues. These were ranked according to their importance, the first intervention seen to be the most important:

#### **a. Capacity building for water harvesting and soil conservation**

This initiative would entail training of communities on feasible options of rainwater harvesting and soil conservation. This could be lead by community development committees where they exist or identified groups in each selected community. The communities should also be capacitated in the mobilization of local and donor funding, particularly in dealing with environmental challenges.

**b. Inter-basin transfer study for water for primary use**

The Ngwavuma Basin is considered one of the most vulnerable regions in the country in terms of poverty. Suggested poverty alleviation projects include those taking advantage of the fertile soils in the basin. However, there is a severe scarcity of water required for irrigation if these projects are to be a success, with climate change likely to further exacerbate the problem. Government and the commercial farmers downstream are now considering inter-basin transfer as a means of adaptation to climate change. This initiative seeks to undertake a pre-feasibility study to examine this possibility. The intervention has a potential partner support from the commercial farmers in the basin. The product would also go a long way in contributing to the basin plan that is expected of the newly established RBA.

**c. Study investigating the opportunity to supply Lavumisa from the Jozini dam through use of flood water in Pongola**

This intervention is a direct trans-boundary climate change adaptation opportunity. It looks at importing water from the Jozini or Pongolapoort Dam in South Africa to irrigate land (3000 ha) within Swaziland. The land to be irrigated sits in both the Pongola and Ngwavuma basins. The project takes advantage of the challenges of extreme flooding in Mozambique as a result annual of flood releases from the Pongolapoort Dam, which may increase as a result of climate change impacts.

There is a definite need for a study on inter-basin transfer for primary use of water. SWADE's Phase II of the LUSIP is working on the commercial aspect of the project, without considering communities. This intervention, however, would need to focus at a community level and be driven by the commercial and private sectors.

**d. Soil conservation/soil erosion – use the Swazi Fund from the Commission**

This project looks at assisting communities in mobilizing funds to start soil conservation measures in the basin.

**List of Stakeholders in consulted Sites**

<b>I. Emkhiweni Inkhundla</b>		
<b>Id.</b>	<b>Name</b>	<b>Tel</b>
<b>Dvokolwako</b>		
1	Msombuluko Magagula	76079060
2	Elias Ndzimandze	76058957
3	Timonthy Magagula	76072257
4	John M. Nsibande	76059932
5	Saul M. Dlamini	76258401
<b>Mbelebeleni</b>		
6	Moyeni Dlamini	76416616
7	Daniel Manana	76140597
<b>Ekutsimuleni</b>		
8	Ruth N. Mncube	76372192
9	Elizabeth Dlamini	76228489
10	Phumaphi Dlamini	76037040
11	Sipho Mhlanga	76573225
12	Joseph Ndwandwe	76808526

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13	Lindiwe Mkhabela	76537742
14	Hellen Magagula	76954169
15	Lindiwe Mavimbela	76144362
16	Themba Nhleko	76089485
17	Mfanuzodlani J. Nhleko	76044256

<b>II. Ka-Shewula Community</b>		
<b>Id.</b>	<b>Name</b>	<b>Tel</b>
1	Wonderboy Sifundza	Not Captured
2	Lucy Mavimbela	Not Captured
3	Gladies Sifundza	Not Captured
4	Alice Magagula	Not Captured
5	Jimson Dladla	Not Captured
6	Emelina Nhlabatsi	Not Captured
7	Fenisi Nhlabatsi	Not Captured
8	Simon Shongwe	Not Captured
9	Sipho Masilela	Not Captured
10	William Shongwe	Not Captured
11	Thobile Sifundza	Not Captured
12	Sphiwe Magagula	Not Captured
13	Ellen Dlamini	Not Captured
14	Gcinokwakhe Lukhele	Not Captured
15	Khanyisile Dladla	Not Captured
16	Jabulane Mnisi	Not Captured
17	Kanger Humbatsi	Not Captured
18	Mabonti Masilela	Not Captured
19	Silondokela Mavimbela	Not Captured
21	Sipho Sifundza	Not Captured
22	Andrias Masimula	Not Captured
23	Fanuel Dlamini	Not Captured

<b>III. Komati River Basin</b>		
<b>Id.</b>	<b>Name</b>	<b>Tel</b>
1	Anne Kruger	3232415
2	Nsindiso Dlamini	3232270
3	Dennis Dlamini	+27839817705
4	Bernard Shongwe	3232162
5	Collin Zwane	+27828023451
6	Binda Zwane	76027846

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7	Sipho Masilela	+2776048782
8	Paulos Methula	76144812
9	Sdumo Dlamini	76363839

<b>IV. Ngwavuma River Basin</b>		
<b>Id.</b>	<b>Name</b>	<b>Tel</b>
1	Mavela Sigwane	76025703
2	Troy Minnor	76021918
3	Solomon Mabuze	76353260
4	Volo Simelane	76059811
5	Wallar Sunks	76139585
6	Nicholas Ngcamphalala	76274080
7	George Scheepers	76021298



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**ANNEX II: VULNERABILITY ASSESSMENT FORM**

Site	Vulnerability criteria										TOTAL (out of 30)		
	Level of poverty 1 = not very high 2 = high 3 = very high	Access to safe drinking water 1 = adequate 2 = poor 3 = very poor	Reliance on rain-fed agriculture 1 = low 2 = medium 3 = high	Floods 1 = infrequent 2 = occasional 3 = frequent	Drought 1 = infrequent 2 = occasional 3 = frequent	Land degradation 1 = minimal 2 = apparent 3 = widespread and problematic	Aquatic alien plants 1 = minimal 2 = prevalent 3 = very prevalent and problematic (Lizinga lasandanezwe lomila emifuleni)	Terrestrial alien plants 1 = minimal 2 = prevalent 3 = very prevalent and problematic (Lizinga lasandanezwe)	Incidence of malaria and waterborne diseases 1 = low 2 = medium 3 = high (Lizinga lemataria nehifo temani)	Ongoing relevant projects in the site 1 = none 2 = few (1-2) 3 = many (3+)			
	(Lizinga lebhuphuya)	(kutfolakala kwemani lahlobile)	(Lizinga lekuncika emvuleni kutelulimo)	(Kuvama kwe-Tikhukhula)	(Kuvama kwesomis o)	(Lizinga lekugedvuka kwemhlaba)					(Lizinga lemataria nehifo temani)	(Lizinga lemisebeni yetentufu uko kulandza wo)	

## **Annex 10. Validation Workshop Report**

*Royal Swazi Convention Centre, Ezulwini  
23 February 2011*

### **BACKGROUND AND PURPOSE OF THE WORKSHOP**

A project validation and appraisal workshop was organised to formally validate the project document by stakeholders. The workshop was held on the 23<sup>rd</sup> February 2011 at the Royal Swazi Convention Centre, Ezulwini, Swaziland. It was attended by a total of 42 participants drawn from diverse stakeholder sectors.

### **WORKSHOP PROCEEDINGS**

#### **1. WORKSHOP OPENING**

##### **Opening Remarks by Principal Secretary MNRE**

The workshop was opened by the Acting Principal Secretary of the MNRE, Mr. Simon Maphanga. In his opening remarks, Mr. Maphanga welcomed all participants to the workshop. He also thanked the UNDP-CO for the support and organizing the workshop.

In his remarks Mr. Maphanga noted that the effect of climate change has introduced both new problems as well as worsening of old problems in the lives of the people of Swaziland. He observed that the country exists in a region where climate change poses serious natural challenges with regards to the occurrence of water. He emphasised that climate change experts have warned that the warming of the earth's climate system is no longer indisputable.

Mr. Maphanga highlighted the goal of the project as being to ensure that national and trans-boundary water resources management is adapted to the expected impact of climate change. He therefore saw this project as one of the country's key interventions to ensure sustainable and equitable water resource management under expected climate change conditions. He stressed that the project must deliver adaptation benefits and ensure the protection of livelihoods from the effects of climate change on water resources through policies, management tools and sectoral investment plans on water and agriculture. He also highlighted that the Ministry would be happy with a project document that was a product of meaningful consultation of the concerned stakeholders and communities. He then invited workshop participants to freely comment on the draft document, and to give the consultants as much feedback as possible. He stressed that it was vitally important for the project to produce tangible outcomes, with the welfare of Swaziland's vulnerable population in mind.

Before declaring the workshop opened, Mr. Maphanga again expressed the Ministry's deepest gratitude and sincere appreciation to the UNDP and the GEF for the support that has been rendered in ensuring the success of the project.

##### **Remarks by the Representative of the UNDP Resident Representative**

Ms. Sithembiso Hlatshwako made remarks on behalf of the UNDP Resident Representative. Ms. Hlatshwako recalled that the work started about three years ago with the submission of the request for funding to the GEF Special Climate Change Fund (SCCF). She also noted the process of stakeholder

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mobilization across sectors to establish project governance structures in preparation for the PPG phase. She explained that the project is part of the UNDP focal area on basic human right of access to water.

Ms. Hlatshwako emphasized the importance of leadership and ownership of the project and process by the country. In this respect, she expressed UNDP's gratitude to the MNRE for ensuring that this phase of the project could happen and the support that the Ministry, through its DWA, had provided. This was evident in the support that the DWA provided to the National and International consultants.

Ms. Hlatshwako also reminded the workshop of the Inception Workshop held on the 18<sup>th</sup> November 2010. She noted that quite substantial issues of guidance were raised in that workshop. The consultants had integrated these with other information from stakeholder and communities and the result was the project document to be reviewed. She invited participants to freely interrogate the document to ensure that it was relevant and realistic for the country. She further invited stakeholders to continue to actively support the project over the next four years.

In conclusion, Ms. Hlatshwako observed that this was the first project on climate change in the country and it was going to pave way for subsequent initiatives, and so it was important that it was executed well.

## **2. PURPOSE/OBJECTIVE OF PROJECT APPRAISAL MEETING**

Ms. Akiko Yamamoto, of the UNDP Regional Coordination Unit (RCU) presented the purpose of the project validation and appraisal meeting. She also briefly outlined the process prior to approval of the project by GEF. She then appealed for contributions by stakeholders during the workshop.

## **3. PROJECT OVERVIEW AND PROJECT DOCUMENT FORMULATION PROCESS**

Dr. Anthony Mills, the consultant team leader, presented the project overview and project formulation process. The presentation also highlighted some proposed adaptation measures included in the project document. He co-presented this second part with Mr. Daniel Malzbender who specifically presented on Outcome 3 "Negotiations on trans-boundary water management for the Incomati and Maputo river basins informed by climate change risk analysis".

### **3.1 Project Overview**

Dr. Mills noted that Swaziland's First National Communication (FNC, 2002) highlights that water resources are highly vulnerable to the negative impacts from climate change. As a result, present government priority was to support policy interventions and strategies that address climate change through an IWRM approach.

Dr. Mills then presented an overview of information from the FNC and other recent scientific studies on the current climate variability in Swaziland. The results show a general increase in temperature and the number of observed warm spells, increase in inter-annual variability in rainfall, and a significant increase in extreme rainfall events. Also notable from these analyses is the significant reduction of rainfall in the months of September and October. The predicted climate change impacts have implications for agriculture (e.g. crop yield decline), infrastructure (e.g. loss of infrastructure), biodiversity (e.g. loss of biodiversity), health (e.g. waterborne diseases), and water resources and hydrology (e.g. reduction in supplies).

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Dr. Mills highlighted that it was against this backdrop that the present project was designed - in response to the anticipated impacts of climate change. The Project Goal, Objectives and Outcomes were as listed below:

- **Goal:** to ensure that the management of Swaziland's water resources is adapted to take into account the anticipated impacts of climate change.
- **Objective:** to promote the implementation of national and trans-boundary IWRM that is sustainable and equitable given expected climate change.
- **Three outcomes:**
  - **Outcome 1:** Informed and inclusive national dialogue on water needs and alternatives, in relation to climate change risks in Swaziland, promoted.
  - **Outcome 2:** Climate change risk management integrated into the implementation of national policies and programmes to promote adaptation on a wider scale.
  - **Outcome 3:** Negotiations on trans-boundary water management for the Incomati and Maputo river basins informed by climate change risk analysis.

The outputs for each outcome according to project design, in response to the anticipated impacts of climate change, were also presented by Dr Mills.

### **3.2 Project Document Formulation Process**

Dr. Mills then presented the project development process which can be summarized as a 7 stage process as follows:

- Special Climate Change Fund (SCCF)
- First National Communication (FNC) to the UNFCCC
- Project Identification Form (PIF) – the project outline
- Project Preparation Grant (PPG) –describing the planning process
- Inception Workshop – the action plan for development of Prodoc
- Project preparation – the implementation of the action plan
- Project Document

Dr Mills highlighted that the launch of the PPG phase was largely with the Inception Workshop on the 18<sup>th</sup> November 2010. The Inception Workshop involved introducing the project to stakeholders and brainstorming on sites and key activities. Stakeholder meetings were then held by the International and National consultants to gather additional information. Visits were also undertaken to project sites by the consultants. Visited sites included Mkhiweni Inkhundla, Mananga (Komati basin stakeholders), Shewula and Nsoko (Ngwavuma River Basin Authority). Information collected in these missions and other stakeholder consultation meetings, combined with desktop information; yielded the draft project document.

### ***DISCUSSIONS***

- Some workshop participants wanted the consultants to explain the rationale of elevating the National Climate Change Committee and anchor a lot of activities around this institution yet it was not even gazetted. Additionally, the document was silent about the capacity building or involvement of crucial institutions such as the National Disaster Management Agency (NDMA). In response the consultants explained that the intention was not really to elevate the NCCC beyond its already defined mandate, but was recognizing the cross-cutting nature of the interventions for climate change adaptation. Also, the project addresses certain aspects of climate-induced disaster management such as flood management, for which type of activities the NDMA was considered a key stakeholder. The

consultants would further describe in greater detail the potential role in CC risk management to be played by the NDMA.

- Another issue raised was that the document was not raising a clear case that the water resources were vulnerable to the impacts of climate change. Further, the conclusion of Prof. Matondo's work cited in the same report regarding the statement that "...water resources in Swaziland are not vulnerable to climate change at the 5% significant level." created a contradictory argument regarding worrying about climate change in the water sector. The consultants noted these comments and promised to look at the issue much closer. The author of this paper may also be consulted for accurate interpretation of this statement.
- There was another concern raised that it seemed in the document that SWADE was assumed to represent the MOA. The consultant was invited to clarify if indeed SWADE was seen to be the long-term link for MOA-inclined activities in this project. The consultants clarified that SWADE would not necessarily be responsible for activities that relate to the MOA. The Ministry would be accordingly involved in those types of activities. SWADE was only cited directly in relation to the SWADE projects which were identified to have links to the present project. The PIF already identifies these SWADE projects. It was also explained that the SWADE investment was also quite substantial and it was therefore important to ensure that SWADE activities were climate-proofed.
- Another concern was raised in that only the negative climate change impacts had been highlighted by the consultants. What about positive climate change impacts that could be taken advantage of? The consultants noted this limitation in the present report, and promised to consider this point.
- It was drawn to the consultant's attention that in relation to trans-boundary water negotiations the Prodoc was proposing capacitating the RBOs such as JWCs and TPTC yet the project was only geographically confined to Swaziland. The consultants noted this point. This would be corrected to refer to capacitating the Swaziland Delegations to TPTC and JWCs. Otherwise a hope was raised that in the long-term a basin-wide project could be designed to involve all three riparian states (Swaziland, Mozambique and South Africa) at the same level.
- Ms. Akiko Yamamoto wanted to know the status of NCCC. The response from some members was that the best placed Ministry to explain would be the Ministry of Tourism and Environmental Affairs. The Ministry would be consulted for details on the plans of this important institution.

#### **4. PRESENTATION ON STAKEHOLDER CONSULTATION PROCESS IN SITE SELECTION PROCESS**

Mr. Dumisani Mndzebele, the National Consultant, presented on the stakeholder consultation process. He highlighted the aim of the process as being to verify if indeed there were climate issues in these sites (identified during the Inception Workshop), and to appreciate the extent of vulnerability of the communities so as to propose relevant intervention in each site.

The process had entailed: i) preliminary site survey/investigations by the National Consultant and setting stakeholder meeting appointments with community leadership structures; ii) meeting with the communities to tap from their experience of the climate change impacts, and to understand their vulnerability situation in relation to climate change and water; iii) documenting information gathered; and iv) undertake follow-up investigative work in potential sites identified with a view to confirm feasibility and costing of required activities.

Mr. Mndzebele further presented that the vulnerability assessment results indicate that communities rate the impact of drought and AIPs as very high. The communities thus rated issues of access to water as very high, and there was a high level of dependency on rainfall. The communities wish to be assisted or capacitated to adapt to these challenges, particularly the climate-induced changes. Land degradation was generally raised as another concern although not rated as high as the concerns related to droughts and AIPs. Flood risk was generally rated low in all the communities consulted.

### ***DISCUSSIONS***

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- Stakeholders wanted to know how communities were viewing groundwater as a potential solution to their potable water supply problems. The consultants clarified that actually most of the vulnerable communities were already utilising groundwater resources and this was the resource that now had constraints, and so they would be keen for more sustainable solutions. They were therefore considering surface water resources or effective rainwater harvesting systems.
- Workshop stakeholders also wondered why the project was not effectively addressing the issue of fighting AIPs if these were a national concern. The consultants explained that the scale of AIPs in the country was too high to be addressed by the proposed project. Addressing this problem should generally be by baseline work by Government. However, there was a component in the proposed activities in the project on fighting AIPs for demonstration purposes and was combined with the reforestation and restoration initiative.
- In relation to one of the proposed interventions by Ngwavuma stakeholders with regard to inter-basin transfer, some stakeholders warned that such an intervention should be handled with care from environmental impacts point of view. Mr. Nkomo, the chairperson, noted that there was no reason to discuss this issue further as the consultants had not selected this option as one of the recommended adaptation measures.

### **5. PRESENTATION ON OVERVIEW OF PROPOSED ADAPTATION MEASURES**

Dr. Mills presented the proposed adaptation measures. The project document presents two main areas of adaptation measures, namely: i) rainwater harvesting; and ii) increasing rainwater infiltration rates through improved land use practices. As part of rainwater harvesting, sand dams would be introduced, and rainwater harvesting systems would be introduced in Ngwavuma and Komati River Basins, Mkhiweni Inkhudla and Shewula community. Capacity building of schools, Tinkhundla, Clinics and NCPs on rainwater harvesting systems would be ensured. In relation to increasing rainwater infiltration rates, reforestation and ecosystem restoration activities would be undertaken. Artificial recharge of groundwater through various means would also take place, to be combined with groundwater quality and quantity monitoring initiatives.

### ***DISCUSSIONS***

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- Workshop stakeholders advised the consultants to concentrate on fewer but more impactful measures considering that the funds were little.
  - There was a great concern about doing something for Shewula area in relation to potable water supply. The Director (DWA) assured the concerned stakeholder that things going according to plan, Shewula community would be having water before the end of the year. There was a planned government initiative, working together with the Swaziland Water Services Corporation, to provide water to Lomahasha town, and the plan was that the same project would avail water to Shewula areas.
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## **6. PRESENTATION ON PROPOSED PROJECT GOVERNANCE STRUCTURE, IMPLEMENTATION ARRANGEMENTS AND STAKEHOLDER INVOLVEMENT STRATEGY**

Dr. Anthony Mills again presented this item. He presented mainly on the management arrangements and stakeholder involvement. There would be a Project Board to be responsible for overall project oversight. Under this would be the Project Technical Committee which would be responsible to provide direction on project implementation at the operational level. There would also be a Project Team to consist of the Project Manager, Chief Technical Advisor, M&E Expert and Administrative and Financial Officer. The MNRE, represented by the Department of Water Affairs (DWA) would be the executing agency. The MNRE (DWA) would be responsible for project implementation in collaboration with the Ministry of Tourism and Environmental Affairs (MTEA) and the Ministry of Agriculture (mainly through SWADE).

Dr. Mills also presented the list of stakeholders to be actively involved in each envisaged project output.

### ***DISCUSSIONS***

- The consultants were advised to revise the composition of the Project Board such that only officials at a comparable seniority level were members of this committee. The same would apply for other committees (e.g. Project Technical Committee).
- Stakeholders observed that the involvement of the private sector and NGOs was lacking in the prodoc. The consultant was advised to ensure that NGOs and Private Sector institutions were among stakeholders involved in project implementation.
- The consultants were also advised to ensure visibility of the Swaziland Environment Authority (SEA) as well, as an important player for such a project.
- The consultant was also tasked to ensure that there was no mixing of roles in the committees and the project team. An example was cited regarding the chairing of Project Board meetings by the Executive, which from another angle was seen as a secretariat of the PB. The consultants promised to ensure roles are clearly defined and that there are no contradictory roles.
- Workshop participants wanted to know the status of the Draft Integrated Water Resources Master Plan (IWRMP) and the Water Policy, and the associated plan of action in relation to approval of these important national documents. The DWA explained that these were before the National Water Authority for clearing before they were ultimately approved through appropriate Government structures. The workshop therefore noted that Output 1.4 may have to be revised to refer to support implementation of the IWRMP and Water Policy as these documents were close to adoption. However, the Director of Water Affairs further assured the meeting that the frequency of updating of the IWRMP meant there would still be an opportunity to accordingly adjust it in the context of adaptation to climate change, during the implementation period of the present project.
- Stakeholders noted that the consultants had proposed to develop a water chapter as the sector's contribution to the national climate change adaptation policy to be developed by the National Climate Change Committee. The consultants were advised to confirm if it was indeed a climate change policy to be developed or a climate change adaptation strategy, so that a relevant document was produced.

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- The consultants were further advised to remove the names of individuals in the proposed project governance institutions. Only names of member institutions would be included.
- The consultants were also advised to trim-down the project management staff. The proposed team was considered too heavy for the size of the project.
- The UNDP-CO representative also assured the workshop that the project staff would be housed within the DWA to ensure "real" ownership of the project and process by Government.
- The workshop noted that KOBWA also had a role to play under Outcome 3. The consultants again noted this point, and will be addressed.
- The consultants were also advised that the budget for project management should not exceed 10% of the overall budget.

#### **7. TECHNICAL WRAP-UP**

Dr. Mills presented the wrap-up, highlighting all the main comments raised by the stakeholders. He assured the meeting/workshop that the consultants would take these into consideration and further refine the prodoc. In case of follow-up additional information required, stakeholders would be contacted accordingly in request of such information. Stakeholders were given till 4 March 2011 to further review the document and send comments to the consultants.

#### **8. SUMMARY OF MEETING AND WAY FORWARD**

Ms. Sithembiso Hlatshwako of the UNDP CO thanked everyone for the active participation both during the workshop and all the consultative stages of the project. She also made special thanks to co-financing partners, UNDP-RTA, Consultant Team, DWA and everyone that contributed in the process.

She indicated that the finalized project document would be submitted to GEF by end of March 2011. It was envisaged that approval of the document by GEF would be concluded between May-June 2011. This meant that things going according to plan, the project would be ready for implementation around mid-year 2011.

Ms. Hlatshwako then invited the workshop to formalise validation of the project document. The workshop endorsed that the Project Document was validated.

- Mover: Dr. Siphon Nkambule
- Seconder: Mr. Boniface Makhubu

#### **9. CLOSING REMARKS**

Mr. Obed Ngwenya, the Director of the Department of Water Affairs, made closing remarks. He thanked all participants for attending and for their active participation. He assured them that their views would be taken into consideration in the process of finalizing the project document. He also made special thanks to UNDP and GEF for funding the project. He then declared the workshop closed.

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**Annex 11. Co-financing letters**

Please find the co-financing letters attached.

