

Business plan for the Regional Science Service Centre for southern Africa

for the start-up phase (2011 to 2015)

Table of Contents

List of Acronyms	3
1 Executive summary	5
2 Introduction	5
3 Context	6
4 Operational audit (the Now analysis)	7
4.1 Description of environment and natural resources and the expected change	7
a. Climate.....	7
b. Water.....	7
c. Forestry.....	7
d. Agricultural land- use	8
e. Biodiversity, wildlife and tourism	8
4.2 Current resource use and economics.....	8
a. Water resources	8
b. Forestry.....	9
c. Agricultural land-use	9
d. Biodiversity, wildlife and tourism	9
4.3 Operational description and current budget expenditures	10
a. Current national research activities	10
b. Regional research activities	10
c. Regional capacity development	11
d. Services and products to address regional needs	12
4.4 Current outcomes.....	12
a. State of natural resource management	12
b. Capacity to deal with natural disasters	13
c. Capacity to adapt to climate change	14
5 Realistic futures – the Where.....	14
5.1 Vision	15
5.2 Mission	15
5.3 SWOT analysis	15
5.4 Goals and objectives.....	16
5.5 Crucial issues	16
6 Action plans – the How	17
6.1 Governance	17
6.2 Legal entity (perhaps Section 21 company model)	18
6.3 Staff structure.....	18
a. Co-ordination and administrative staff component.....	18
b. The Research component.....	19
c. The Services and Products component	19
6.4 Infrastructure	20

6.5	Research plan	21
a.	The preliminary research plan as proposed by the German Science Consortium	21
b.	The research needs identified during the national stakeholder workshops.....	22
c.	The proposal developed at the Technical Working Group (TWG) meeting	22
d.	Activities with deliverables projected over three different time-scales:.....	23
e.	Schedule for finalisation of the science plan.....	24
6.6	Capacity building plan	24
6.7	Products and Services.....	24
6.8	Planning.....	25
6.9	Monitoring and evaluation (M&E) in relation to programme implementation.....	25
7	Funding projections	27
7.1	Potential funding allocations.....	27
7.2	Country contributions and sustainability strategies	28
8	Implementation time-line	29
9	“Bigger picture” linkages.....	30
10	Development of this Business Plan (its history)	30

List of Acronyms

ACCESS	Africa Centre for Climate and Earth System Science at the CSIR
BMBF	Federal Ministry for Education and Research, Germany
CCARDESA	Coordination Centre for Research and Agricultural Development of Southern Africa
CSIR	Council for Scientific and Industrial Research
ESF	Ecosystem functions
ESS	Ecosystem services
ESSP	Earth System Science Partnership
GEO BON	Group on Earth Observations - Biodiversity Observation Network
GEOSS	Global Earth Observation System of Systems
ICSU ROA	International Council of Scientific Unions - Regional Office for Africa
ICSU	International Council of Scientific Unions
IGBP	International Geosphere-Biosphere Programme
IHDP	The International Human Dimensions Programme on Global Environmental Change
IPCC	Intergovernmental Panel on Climate Change
Okacom	Permanent Okavango River Basin Water Commission
RAP	SADC Regional Agricultural Policy
RSSC	Regional Science Service Centre
SADC	Southern African Development Community
SPGRC	SADC Plant Genetic Resources Centre
TWG	Technical Working Group
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	UN Framework Convention on Climate Change

WASCAL West African Regional Science Service Centre
WCRP World Climate Research Programme

1 Executive summary

This Business Plan for the Regional Science Service Centre (RSSC) for southern Africa was jointly developed by technical experts from the participating countries during October 2010 for consideration and possible endorsement at the Luanda Round Table. The BMBF has made up to € 100 million in start-up capital available for the two regional centres combined as well as scientific expertise through the Science Consortium.

An operational audit helps to set the scene by describing briefly the status of regional environment and natural resources, their current uses, and an overview of current research at national and regional levels. Currently 40-60% of the population of southern Africa lives in rural areas and is heavily dependent on natural resources for their daily living. Water is rapidly becoming a limiting resource in the region. As many of the larger river basins are shared between two or more countries, joint management based on good baseline data are required.

An aspired future for this programme is then painted. This includes a vision for the RSSC and an identification of crucial issues. Significant gaps have been identified during the national stakeholder workshops across the thematic areas, but cross-cutting issues have also been identified such as capacity development and improved access to data and knowledge management.

Action plans are presented for the main topics as these relate to the actual implementation of the programme, i.e. governance; proposals for staff structures; infrastructure options; a research plan; a capacity development plan; as well as a scoping for services and products. This chapter is concluded with a section on planning; monitoring and evaluation.

A funding proposal is presented to implement this Business Plan. The donor funding is put into perspective by comparing it to current government expenditure within appropriate sectors.

A time-line is presented for the major steps required to operationalize this programme. In a concluding section, some linkages to higher level national, regional and global objectives are highlighted. Finally, a brief summary is included that documents the further development of this Business Plan.

2 Introduction

Five countries within southern Africa, namely Angola, Botswana, Namibia, South Africa and Zambia, in co-operation with the German government, through the Federal Ministry of Education and Research (BMBF), desire to initiate a Regional Science Service Centre programme to address the regional impacts of climate change and land use change on fresh water and land resources, including biodiversity; and the consequent ability of ecosystems to serve the human population dependent on them in an equitable and sustainable manner.

The BMBF has made up to € 100 million in start-up capital available for the two regional centres combined as well as scientific expertise through the Science Consortium.

National stakeholder workshops, one per country, were held during July and August 2010 to determine national research needs. These workshops were well attended; lasted two to three days, during which many research needs were identified. These

needs have been summarised and analysed, and will be used as a basis on which to formulate research projects.

A Technical Working Group, constituted from technical experts and RSSC staff from the different countries, met in late September and agreed on the framework for this Business Plan. The Technical Working Group discussed the different elements of the Business Plan with the aim to prepare a number of areas for the final decision-making by the next Round Table meeting, scheduled for November. Alternative options that need to be decided upon by the Round Table are shown in the text. However, the Round Table may also discuss additional issues and come to other decisions than those proposed here by the Technical Working Group.



Figure 1: Structure of the Business Plan

3 Context

The RSSC initiative is aiming at adaptation to the impacts of climate change through improved understanding of drivers, trends and impacts and by improving ESF and ESS through adapted sustainable natural resource management. At this stage it is still difficult to predict the exact consequences of climate change at sub-regional scale.

The RSSC initiative is placed within the context of: (i) the strategic and policy work being done in Africa on climate change (under the AU and the Africa Ministerial Conference on Environment); (ii) the strategic and policy based work being done

within the context of SADC; (iii) the strategic programmes at national level within each of the involved countries. The planned RSSC research activities will be adapted to the regional and sub-regional strategic context. In respect of getting stronger support at sub-regional level, it may be important to get the RSSC included in the agenda of the next SADC technical / environmental meeting, followed by the Ministers meeting. Similarly, the RSSC initiative is placed within the context of the international Global change programmes, WCRP, IGBP, DIVERSITAS and IHDP, integrated within the ESSP, as well as ICSU, with its regional office, ICSU ROA. The RSSC initiative is further placed within the context of UN programmes, especially UNEP and UNESCO and other international initiatives like e.g. GEOSS, with its GEO BON.

The final formulation of the RSSC Science Plan will ensure tighter integration with all of these initiatives and conform with the National Communications on Climate Change, as required by the UNFCCC.

4 Operational audit (the Now analysis)

4.1 Description of environment and natural resources and the expected change

a. Climate

The western part of southern Africa has a naturally dry climate as a result of low rainfall and comparatively high evaporation rates close to the subtropical high pressure cell. Most of the region receives summer rainfall, while the Western Cape region and the south-western portion of Namibia also receive winter rainfall. Climate change models (e.g. IPCC) project a drastic increase in mean annual temperature and a strong decrease in precipitation within the next 90 years.

b. Water

Many people in the region as well as economic development are dependent on a few larger rivers; especially in the central part of the five participating countries. These major rivers include the Kunene, the Okavango (called the Cubango in Angola), the Zambezi, the Limpopo and Orange/Gariep. All of these rivers are shared between the different countries.

As surface water is very limited, a large percentage of the population depends on ground water resources. Some aquifers stretch across country borders, for example, the so-called Stampriet aquifer is shared between Namibia and Botswana and seems dependent on exceptionally good rainfall seasons for its recharge. Due to population growth and increasing water consumption all these water resources are increasingly exploited. Already now the abstraction rates exceed the recharge rate in many of the groundwater systems. Climate change may increase the frequency and intensity of droughts and floods.

c. Forestry

Natural savannas (arid savanna and woodland savanna), moister deciduous woodlands and plantations, (mainly in South Africa) and their wood resources in

the sub-region, as elsewhere in the world, are under pressure due to increasing exploitation and generally show a steady decline . Although vast areas currently still covered by Miombo Woodland Savannas (in the broad sense) are relatively intact as compared to Tropical Rainforests, these areas are subjected increasingly to pressures as a result of an expanding human population.

d. Agricultural land- use

Agriculture is essential for food security and an important employer, both in the informal and formal sectors in southern Africa. Although currently constituting approximately 40–60% of the population in the five countries, the rural population is predicted to drop to 20–40% by 2050.

The percentage rural population¹ in the participating countries in 2010

Angola	Botswana	Namibia	South Africa	Zambia
41.5	38.9	62	38.3	64.3

Dryland agriculture and livestock farming are important activities, while irrigated land is found adjacent to the perennial rivers in moister climates characterised by rain-fed agriculture. With increasing population and decreasing water resources, it will be a great challenge to guarantee food security within the coming decades. Improved support infrastructure and marketing opportunities should reduce current wastage in some areas, where production is otherwise high.

e. Biodiversity, wildlife and tourism

The region is rich to very rich in biodiversity, with many endemics adapted to the arid conditions. The region, and in particular, Botswana, Namibia, South Africa and Zambia, has a large wildlife population and a strong wildlife-based tourism sector. The tourism sector is rapidly growing and creating job opportunities for rural people, where few alternative formal job opportunities exist. Climate change and the expansion and intensification of land-use are predicted to be a threat to the maintenance and survival of organisms and ecosystems, including their functions and services.

4.2 Current resource use and economics

a. Water resources

“Currently, it is estimated that over 300 million people in Africa face water scarcity conditions. About 75 per cent of the African population relies on groundwater as the major source of drinking water, particularly in northern and southern Africa. However, groundwater represents only about 15 per cent of the continent’s total renewable water resources.” UNEP (2008), “Africa: Atlas of Our Changing Environment.”

¹ http://esa.un.org/unpd/wup/unup/index_panel1.html

Fresh water resources are increasingly more limited especially in South Africa, Botswana and Namibia. Currently a large proportion is used for irrigated agriculture, which from an economic point of view has low resource use efficiency. Conflicts for water-use for competing purposes, e.g. irrigation agriculture, ecotourism (e.g. Okavango delta), industry and mining are at present still balanced through national mechanisms and international commissions like e.g. Okacom, but will face increasing pressure.

b. Forestry

“Forests account for over 20 per cent of Africa’s 30 million km² of land area, but are being destroyed and degraded by logging and conversion to plantations, agriculture, roads, and settlements. As a region, Africa is losing more than four million hectares of forest every year—twice the world’s average deforestation rate.” UNEP (2008), “Africa: Atlas of Our Changing Environment.”

Timber resources are increasingly exploited through expansion of traditional uses, illegal logging, and in some cases, intensified off-take for international markets. Furthermore, the availability of the resource is under pressure due to competition with other land-uses, aridification and partly due to increase in frequency of wild-fires. The economic value of the ecosystem services provided by arid and woodland savannas, is not yet fully understood.

c. Agricultural land-use

“Land in Africa is becoming increasingly degraded. Erosion and/or chemical and physical damage has degraded about 65 per cent of agricultural lands. This has forced farmers in many places to either cultivate marginal and unproductive soils, further degrading the land, or to migrate to cities and slums. Some areas in Africa are said to be losing over 50 metric tonnes of soil per hectare per year.” UNEP (2008), “Africa: Atlas of Our Changing Environment.”

Food resources in the region are largely produced on traditional small-scale fields, including various combinations of crops, agroforestry systems and shifting cultivation. Large-scale agro-technological land-use forms are common in the moister parts of South Africa, expanding also in Zambia and Angola, partly in a context of “land grabbing”, i.e. land use by foreign companies. The relative value of cash crops and other agricultural products depends strongly on the context of *inter alia* poverty; general lifestyles and changing consumer habits. With climate change impacts likely, agricultural productivity in the south could decline and Angola and Zambia could become the ‘new’ breadbaskets of the region.

d. Biodiversity, wildlife and tourism

“Africa’s rich biological diversity—one of the region’s most stunning attributes—is in jeopardy due to a confluence of habitat destruction, poaching, and increasing populations. Africa contains over 3 000 protected areas including 198 Marine Protected Areas, 50 Biosphere Reserves, and 80 Wetlands of International Importance. Eight of the world’s 34 international biodiversity hotspots are in Africa. Despite their recognized status, these areas remain under threat by civil unrest and encroachment, as well as the introduction of alien species. Resolution of such predicaments has been undermined by administrative problems including lack of funding and inadequate staffing or training.” UNEP (2008), “Africa: Atlas of Our Changing Environment.”

The value of biodiversity and wildlife is at present largely perceived as value for tourism, being of very great relevance in Namibia, South Africa and Botswana, to a lesser extent in Zambia, while in Angola tourism is negligible as a consequence of the civil war. Agro-diversity is an essential and hitherto somewhat undervalued component of biodiversity that should be elevated and investigated. The optimal and sustainable exploitation of these resources within the context of sustainable agriculture are key issues to future food security.

4.3 Operational description and current budget expenditures

a. Current national research activities

The current research activities of the five southern African countries are of extremely different dimension and focus. At one end of the spectrum, well-developed systems of scientific institutions and funding exist and are involved in many modern scientific disciplines at an internationally competitive level. These include meteorological sciences; environmental sciences; and agricultural sciences. At the other end of the spectrum weakly developed systems of scientific institutions exist; with the situation in some countries being intermediate between these two poles.

In the five countries involved in the RSSC programme, country-specific research programmes and initiatives are currently being implemented.

National research priorities are often regarded as more urgent above those of the region by governments. This has an impact on the development and implementation of regional natural resource management strategies, based on and integrated with appropriate national strategies developed as a result of robust scientific data. One of the future challenges for the RSSC will be to demonstrate the importance and appropriateness of a more regionally-orientated approach to common issues within the scope of the RSSC, addressing directly research questions encapsulated in the various SADC Protocols and Strategies.

One of the primary roles within the regional ambit of the RSSC should be related to the integration of scientific approaches, analyses and results, as well as related service provision at the various levels (local, national and regional).

b. Regional research activities

“Africa also has 59 international trans-boundary river basins, which cover about 64 per cent of the region’s land area, contain 93 per cent of its total surface water, and are home to 77 per cent of the population. Multinational approaches are essential to conserving these shared areas, underscoring the need for cooperative management strategies among bordering countries.” UNEP (2008), “Africa: Atlas of Our Changing Environment.”

At regional level, SADC has established some centres of excellence (= strategic centres). With regard to scope, structure and operations, the SADC Plant Genetic Resources Centre (SPGRC) in Lusaka is an example of a similar technical and capacity development network that could provide useful lessons learnt for

consideration in designing the RSSC. Various policy frameworks that support research and development have been developed by SADC, e.g. the Regional Agricultural Policy (RAP) is currently being finalised. SADC countries are co-operating on climate change issues, specifically the development of appropriate coping mechanisms. New initiatives like the Co-ordination Centre for Research and Agricultural Development of Southern Africa (CCARDESA) will hopefully improve impact, capacity and awareness, within the broader agricultural context, including forestry.

In addition, there are a number of trans-boundary projects, partly initiated by NGOs. South Africa has developed some regional activities regarding meteorological and marine research (ACCESS) and there are a number of links between prominent South African research institutions and various regional partners. However, these activities are either thematically specialised or not implemented necessarily across regional landscapes.

At present there is no focussed, truly regional programme that aims at regional integration of the thematic areas identified for the RSSC. More importantly though is the level and extent of collaborative research (interdisciplinary) and cross-sectorial and regional initiatives, which are rather poor in the region (with a few exceptions, see 3.3 c. below). Thus, the RSSC can be regarded as an innovative, progressive regional initiative that is unique and multifaceted, undertaking needs-based research; expanding the current knowledge base; providing services to a broad range of users; and providing a cross-sectorial platform for science-policy interface within the scope of land, water and climate change.

c. Regional capacity development

The five countries display trends for regional academic capacity development, similar to those for research, as elaborated in (a). There is no comprehensive, integrated regional capacity development programme, addressing the thematic areas of the RSSC. The qualifying training needs within the region are either covered by the national universities or, to a large degree, by South African tertiary training institutions and, to some extent, by overseas institutions.

In line with section 3.3 a. & b. above, capacity building efforts are rather disparate in scale and limited in the region, (within a RSSC country context). Post-Copenhagen (UNFCCC COP 15), there has been a marked increase of programmes related to climate change in the region, with the institutional grounding being better in some countries than others. Some of these programmes are:

- The Global Change System for Analysis, Research and Training (START)
- UKAid has recently funded a Regional Climate Change Programme in southern Africa, that began its five- year implementation phase in February 2009
- USAID are funding a climate change capacity building programme for SADC (www.rvatlas.org/sadc), implemented by the CSIR Climate Change Group, the Climate System Analysis Group at UCT, and Kulima Consulting. One of the outputs, currently in draft form, is a SADC Climate Change Handbook.

There are some collaborative initiatives/programmes between countries (student exchanges, M.Sc. and Ph.D. programmes and others). These tend to be more academic in nature. There is an increasing realisation that challenges for the region need a range of regional strategies and interventions. The main challenge is to integrate these efforts, from conceptualisation to implementation, at regional level to ensure complementarity and avoid duplication of effort. The regional 'identity' of issues and potential solutions needs to come from a proactive and collaborative process that includes SADC Secretariat, the countries involved and external input in an attempt to create that 'regionality' of purpose. The RSSC could provide an opportunity to appraise such an approach, which moves beyond academia into a more implementation-based, policy-informing process, aimed at the ultimate improvement of livelihood opportunities across the region.

d. Services and products to address regional needs

Consequent to the lack of regionally integrated research activities, there is also a deficiency in scientific products that could be translated into or form the base of regional services.

Demand-driven services and products will be varied but will fall within a framework of co-operative programmes involving research institutions and research themes with regional relevance. Examples of such services include vulnerability assessments and assessments of ecosystem functioning and management (goods and services; economic aspects of benefits); early warning systems; open access data systems making relevant information available across the region; scientific excellence and commensurate research (based on regional priorities; regional modelling, predictions and scenario planning; policy option analyses, and others (appropriate and realistic).

4.4 Current outcomes

The national stakeholder workshops identified a number of gaps through considering the regional impacts of climate change and land use change on fresh water and land resources, including biodiversity; and the consequent ability of ecosystems to serve the human population dependent on them in an equitable and sustainable manner. In the frame of this scope the following more specific gaps have been identified by the national stakeholder workshops:

a. State of natural resource management

Through the process of the national stakeholder workshops, numerous gaps impeding successful sustainable natural resource management were identified.

(1) **Quantification and assessment:** With the exception of South Africa, all countries highlighted the need for reliable baseline data as a basis for decision-making. Improved networks envisaged for data management and use varied across RSSC countries and also varied according to sector, e.g. data management in terms of conservation areas is adequate (generally speaking), while water resource management data (water quality) is more of a challenge with some areas (local, national and regional scales) implementing effective water

management regimes, and other areas having massive challenges regarding both water quality and supply. These disparities are set to increase over the medium-term as climate change impacts realised. Proposed needs include weather stations, flux gauges in rivers, soil fertility assessments; biodiversity monitoring systems, or similar measures to measure and assess status, trends and intensity of changes.

(2) Drivers of change: Interest in better understanding drivers and causes of change was expressed in all workshops. This was partly related to climate change or changes in the oceans, and partly to the role of new and highly competitive land-use types. Specific examples included globalized food markets and prices; regional consumer dynamics and consumption habits; incentives and market mechanisms; poverty-driven dynamics; institutional weaknesses; tenure conflicts; and the (growing) role of tourism.

(3) Change, impact and vulnerability: These interconnected issues were mentioned at all workshops and a number of needs were expressed. In addition to observation systems to monitor general trends in all relevant fields, the observation (by a combination of remote sensing and ground-truthing) of extreme events was highlighted in all workshops. Such observations are either regarded as a necessary step to directly develop early-warning systems for extreme events or to establish improved process understanding as a precondition for improved models. These models will allow the generation of scenarios on future trends of consumption and demand, but also of impacts and on the vulnerability of ecosystems and societies.

(4) Improved management: The majority of needs expressed at the workshops were directly aimed at scientific support for services that need to be established in order to improve sustainable management of natural resources. In this context, improved weather forecasting (including seasonal time-scale), was specifically mentioned, with the need to develop national strategies on the use of limited resources, for example decision-support systems that ensure that all relevant factors are taken into account. The need for restoration of degraded systems was also repeatedly mentioned. Integrated Community-based Resource Management was regarded as an important participatory approach, the application of which should be further expanded. Spatial planning and zoning are regarded as being of high relevance for efficient land-use, derived from spatial data, reliable resource mapping, resource economic analyses considering the values of ecosystem services, and scenario analyses for vulnerability and potential.

b. Capacity to deal with natural disasters

The reduction of disasters and their impacts was an important element in the discussions. The avoidance of future disasters based on realistic scenarios of potential change is one approach. A strong need was expressed to better observe and within-event predict the timing, intensity and geographical extension of floods, fire, drought etc. in order to reliably trigger appropriate response measures.

Developed countries are mostly adequately equipped to cope with and mitigate the impacts of dramatic events such as floods and hurricanes. In contrast, in the countries that form part of the RSSC programme (and in Africa in general), impacts of disasters are extreme, especially for poor and rural population groups. This is partly because the region is not always aware of these events, and neither are there appropriate strategies in place to deal with these events

should they occur. Where strategies exist, the capacity to implement these is generally poor, especially at a trans-boundary level. The impacts of the sometimes even 'mild' events in terms of livelihoods only exacerbate and promote further vulnerability of the majority exposed to these events.

Increased urbanisation in the region, projected to grow to over 50% of the population in the next decade, will increase the vulnerability of urban societies (urban fringe, informal settlements, settling below the flood lines, etc.) and thus highlights the importance of adaptation strategies in this regard. Community-based adaptation strategies will become more relevant both in terms of dealing with the impacts of climate change at a societal level and increasing awareness of the impacts related to climate change and their relevance within an urban context. The manner in which local authorities respond to the impacts of climate change, within their planning/development processes, will become increasingly relevant.

c. Capacity to adapt to climate change

The above interventions are needed in order to adapt to climate change in the sense of reconstructing the economical geography and the economic strategies of a region. Decision-making in this political region is a huge responsibility, requiring not only a reliable analysis of change and vulnerability but also the right communication fora and formats and development of specific governance instruments.

The region's ability to respond to natural climatic variability as well as adapt to climate change is currently limited, due to a lack of resources. There are, however, exceptions at a localised level, where some local authorities have taken a more proactive approach to integrate climate change adaptation into development/planning processes. The region needs to recognise that opportunities for adaptation to climate change do not necessarily imply high costs or expensive technologies, but rather appropriate interventions at a local level within the current context. The RSSC can play an important role in identifying appropriate interventions, based on the outcomes of a relevant, robust science programme. It will be thus very important to review current and planned climate change-related initiatives in the region so as to identify opportunities for integration and collaboration.

5 Realistic futures – the Where

“Despite the numerous challenges, people across Africa are taking significant steps towards protecting and improving their environment. A number of images show the positive results of some of the many efforts undertaken to not only stem environmental destruction, but to reverse it. Success stories include land revitalisation evident by the growth of tree clusters in certain images of Niger, and in one instance, the expansion of wetlands resulting from a restoration project to control flooding in Mauritania.”

“Alleviation of poverty is a key step towards establishing an environment in which people are empowered to make sustainable choices. The economy of Africa can be expanded beyond its agricultural base to increased investment in the services and manufacturing sectors. Development for both local consumption and exports, balanced with environmental preservation, can bring Africa to a position where its wealth of natural resources is more accurately reflected in the economic status of its peoples. Coupled with education and training,

and empowerment of women, a broadened economy in Africa would enhance local employment prospects as well as economic opportunities to trade in world markets. Many factors, such as governmental policies, cultural and social milieu, play a role in whether we will achieve global environmental sustainability. But as is the case in environmental systems, all the pieces are interconnected. Once people are secure enough to choose, one can, if wise, opt for the land and resource use alternatives that are sustainable and regenerative. In the absence of such opportunities, it is likely that people will continue to make expedient choices for their survival, which, voluntarily or involuntarily, can result in environmental degradation.” UNEP (2008), “Africa: Atlas of Our Changing Environment.”

5.1 Vision

The RSSC “vision” is

To establish a network of science service centres, strengthening the regional scientific capacity to enable adaptation to climate change and land use change with regard to their impact on fresh water and land resources, including biodiversity, ecosystem functions and services in the southern African region and, within this ambit, to endeavour to provide scientifically robust, relevant and timely information for policy and development planning processes that will promote the improved livelihoods of the broader society.

5.2 Mission

The Mission of the RSSC is:

- To conduct research on the drivers and trends of climate change and land use change and their impact on fresh water and land resources, as well as ecosystem functions and services enabling the adaptation of sustainable natural resource management to the changing conditions.
- To support capacity development, both in terms of human and infrastructure capacity, to improve the capacity of the region to promote natural resource management and thus enable adaptation at regional scale.
- To provide services and products that will raise awareness and provide robust scientific support to stakeholders to ensure broad participation and ownership of interventions and implementation, as proposed above.

5.3 SWOT analysis

Strength – Climate change is a critical issue within the region. Periodically exposed to natural disasters (flooding, drought), the need for a better managed response mechanism is recognised. Strong support from regional political decision-makers, scientists, as well as NGO community, to support this initiative was demonstrated during the national stakeholder workshops. The need for strengthened regional scientific capacity, to support policy, plans, programmes and decision-making related to climate change response, was clearly expressed.

Weaknesses – National governments, as well as the science community in the partner countries, are fairly diverse in their capacity to react to climate change challenges. Regional approaches and strategies are currently limited and national buy-in is also weak.

Opportunities – Regional integration has been pursued on both the political and economic fronts over the last decade, but national priorities are still given preference. SADC has expanded and has been strengthened, and the time is opportune to extend trans-boundary development into the spheres of science and technology development, as well as natural resource management. .

Threats – Cognisant of the slow rate of implementation of some previous regional initiatives, a lengthy bureaucratic process could compromise accessibility of the current funding and the loss of momentum already in place for project start-up.

5.4 Goals and objectives

Within the defined scope (as defined under 5.1 (vision) and 5.2 (mission) it is proposed to initiate a new type of institution, focused primarily on the delivery of scientific services to stakeholders and users, based on integrating basic and applied research across the region. This Business Plan promotes an integrated concept, covering research, capacity development, service delivery and application, based on three-way communication amongst scientists, policy makers and resource managers/ users.

All the above goals shall be supported by three cross-cutting elements:

- i. “Forum” function: Communication forum between science and public/policy
- ii. “Network” function: Improving regional scientific communication and cooperation
- iii. Transfer function: Knowledge flows between science, public policy, and private initiatives

5.5 Crucial issues

- a. Water shortages – Regional co-operation to foster understanding of the shared water resources and how best to manage these jointly.
- b. Deforestation – Establish a base-line and monitor regional change in extent and rate of deforestation, forest structure, services and functions and value.
- c. Improved agricultural productivity – Improve agricultural productivity in a sustainable way to alleviate pressure on ecosystem services, wildlife or forestry areas, considering global change and the need for adaptation in response to many pressures; while giving attention to optimal use of agro-diversity.
- d. Conserving biodiversity – promoting its sustainable utilization and sharing benefits through its utilisation, including through tourism development – Maintain and where possible expand wildlife areas through recognising wildlife utilisation and wildlife-based tourism as legitimate and appropriate land-use options, where applicable.
- e. Developing a platform for science-policy interface – research that deals with government-identified priorities is critical to catalyse the generation of relevant knowledge

- f. Institutional weakness (in general, in the region) – lack of integration; no ‘regional’ identification of issues; Lack of capacity.
- g. Reactive rather proactive engagement, especially at regional level.

6 Action plans – the How

Consideration has to be given to general operations, human resources, innovation, finance, and the actions required to convert ideas into actions.

6.1 Governance

The Governing Body of the RSSC will be a Board made up of the lead Ministers from each of the five participating southern African countries and Germany, or their designated representatives. Financial, legal and scientific expertise should be available to the Board. This Board will be directly responsible for all high-level decision-making and guidance to the RSSC. The Board will oversee all policy issues and approve annual budgets.

A Regional Steering Committee, together with the full-time Secretariat will advise the Board on all technical issues. The core Regional Steering Committee will be primarily made up of representatives from the National Steering Committees (ensuring regional balance) and thematic programme champions (ensuring scientific quality) as well as landscape coordinators (integrating disciplinary work within “landscapes” (compare 6.5).

In the initial phase, also key government stakeholders should be represented on the steering committee. Clearly for the Regional Steering Committee to be effective there needs to be a good balance between specialists from different disciplines as well as generalists, planners etc. to start bridging the Science/Policy divide.

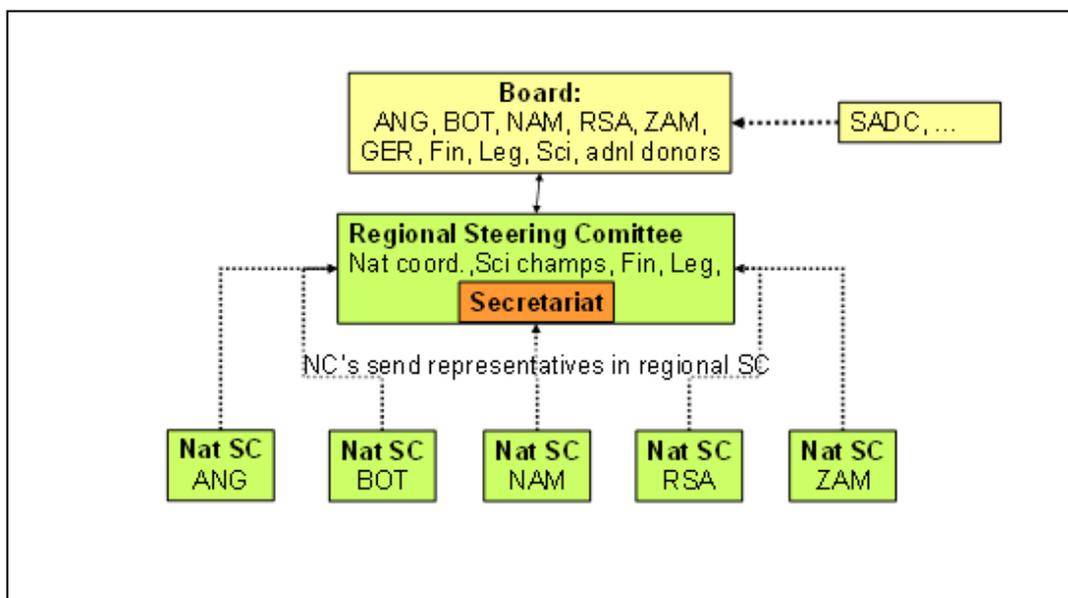


Figure 2: Proposed governance structure for the regional RSSC (Nat SC refers to National Steering Committee)

6.2 Legal entity (perhaps Section 21 company model)

Following a recommendation from the Technical Working Group, the feasibility to register the RSSC as a Section 21 Company in the participating countries needs to be explored. An auditing company has been approached to provide expert opinion (options/preferences) on this issue prior to the Round Table meeting in November. Once this statement is available it will be forwarded to participating countries for legal scrutiny and consultation with the Office of the Attorney General or other competent authorities as per National procedures.

6.3 Staff structure

Three broad staff components are envisaged:

- Co-ordination and administrative staff, responsible for planning and co-ordination, financial management, M&E;
- Scientific/technical staff appointed specifically to support projects at geographic and thematic levels; and
- Staff responsible for Services and Products

A general principle throughout should be to outsource non-core functions when feasible, i.e. the RSSC should not, for example, employ cleaning or security staff. In the following section, professional staff requirements have been identified only. Clearly other technical and support staff will be required depending on centre specialisation and affiliation.

a. Co-ordination and administrative staff component

Based on 8% to 10% management cost for the € 40 million (see Section 7.1), this would translate into 15 to 19 professional staff for the region (including national co-ordination) or equivalent staff costs.

The Regional Secretariat

Functions:

Planning and Monitoring and Evaluation (M&E)

- Compile detailed annual work plans at regional level, together with national co-ordination units.
- Constantly review, assess, evaluate and support the progress, implementation and congruence of all regional programme elements.

Staff functions

- Recruit lower level staff.

Liaison and service delivery

- Undertake public relations and outreach.
- Contribute to adequately structure regional dissemination of information, knowledge and service elements through website and other opportunities.
- Assume responsibility for regional publications and branding.
- Ensure and strategically improve service provision.
- Support and facilitate stakeholder involvement and interaction, e.g. to agree on protocols.

- Liaise with additional SADC countries and West African RSSC (WASCAL).
- Include other SADC countries into early studies.

Funding

- Identify and develop additional funding proposals.
- Mobilisation of financial resources.

Staff composition for Regional Secretariat:

- 1 Regional Co-ordinator,
- 1 Financial Manager - administration of funds, develop sustainability models
- 1 Project Manager for monitoring and evaluation of projects,
- 1 Liaison Officer/Communications expert
- 1 Services and products manager
- 1 Training Co-ordinator
- 2 Accountants – administration of project payments

Staff composition for In-country Co-ordination Units

- 1 National Co-ordinator
- 1 Accountant

b. The Research component

The staff component working on research projects is seen as being very flexible, dependent on the activities to be conducted and expertise required for the individual projects.

The major part of the actual research work will probably be conducted by students working on their M.Sc. and Ph.D. projects on a full-time basis for their individual project duration, by postdocs and visiting scientists or by specialists from the region recruited on contract basis, as required. Due to the applied character also other levels of research like e.g. para-ecologists, community based monitoring will be established.

Supervision and coordination could be established based on single project leaders, thematic champions and landscape coordinators, the latter ones bringing together the various thematic working groups engaged in a particular landscape to plan activities, jointly monitoring progress and conducting a quality control function to ensure a holistically integrated, high quality product. The science projects will be managed by the National Co-ordinator and the Regional Secretariat regarding funding and all administrative issues.

c. The Services and Products component

These professionals should have a science background, but would really be knowledge managers, communication experts etc. A second group belonging to this component could be service providers linked to a specialised activity, such as remote sensing, soil analysis lab, etc. Specialist services must be strongly linked to, for example, communication experts to ensure that services and products that have impact are delivered efficiently and effectively.

6.4 Infrastructure

Attractive infrastructure, apart from its obvious utility value, can provide a strong anchor point for a programme, such as the RSSC. Infrastructure within the countries will primarily be used by the Co-ordination and Services and products components and probably only serve as base for the science component. Most members of the TWG are of the opinion that, in addition to the office accommodation for the Regional Secretariat, there should also be a new infrastructure to house at least a part of the RSSC activities (research, training, outreach, services, data centre, analytical units, perhaps labs).

There are at least two alternative options on which the Round Table needs to make a decision:

Option 1:

The establishment of one large infrastructure would probably be the most efficient investment strategy, allocating the largest number of positions to the core RSSC work (research, capacity development, services), as compared to the proliferation of technical and other support staff needed for several buildings.

On the other hand, there is a great risk that the trans-boundary co-operation and data fluxes may only develop to a limited extent with the one large infrastructure in one host country scenario. The other countries may regard themselves as “losers” in a bidding process and develop little ownership on the regional co-operation, data flux and application of results.

Option 2:

In a second scenario, four equal centres are proposed for Angola, Botswana, Namibia, [South Africa] and Zambia. Additional infrastructure would be added to one centre, dependent on BMBF preference and negotiations at the November political Round Table, to serve as a base for the Regional Secretariat. South Africa has indicated that they would not want infrastructure from this programme. The centres will have an approximate size of 1 000 m² each, equal in size to the National Botanical Research Institute, Windhoek, which the TWG visited.

The offices for the Regional Secretariat represent approximately 25% of the cost of one of the above country centres.

The assumption that building costs are similar in the four countries is a simplification of the real situation and real building costs need to be determined during the detailed planning phase. The building costs used here, are based on those determined for Namibia.

Options to be considered concerning infrastructure

Option 1 - One regional centre for the entire region, which will also house the Regional Secretariat.		
	Recommended	Not recommended
Option 2 - Four (potentially five if SA decides to have a part in the equal centres approach) equal centres, one per country, with the smaller Regional Secretariat attached to one national centre. The country centres can also be split up and be attached to existing organisations, i.e. a soil lab to university.		
	Recommended	Not recommended

In addition to the centre/s, there will be other infrastructures like field stations, specific infrastructure for capacity development, service units. These are not discussed here, as they will be defined through the final research plan, capacity development plan and service plan.

6.5 Research plan

The research plan forms the backbone of the RSSC as it will define the outputs that will allow the creation of services to be offered to user groups. The research plan will also partly drive the capacity development plan, regarding academic and non-academic capacity development.

a. The research plan is based on three elements:

i. The preliminary research plan as proposed by the German Science Consortium

In July 2009, the BMBF called for science consortia in Germany to express interest in participating, in a technical capacity, in this initiative. German experts/institutions prepared research proposals, demonstrating technical competencies and prior experience within the southern African context, and submitted these as competitive bids. Following a technical review process, and based on these research proposals, this particular Science Consortium (co-ordinated by the University of Hamburg) was selected by the BMBF. A summary of the proposal is presented in “mind map” format in Figure 2.

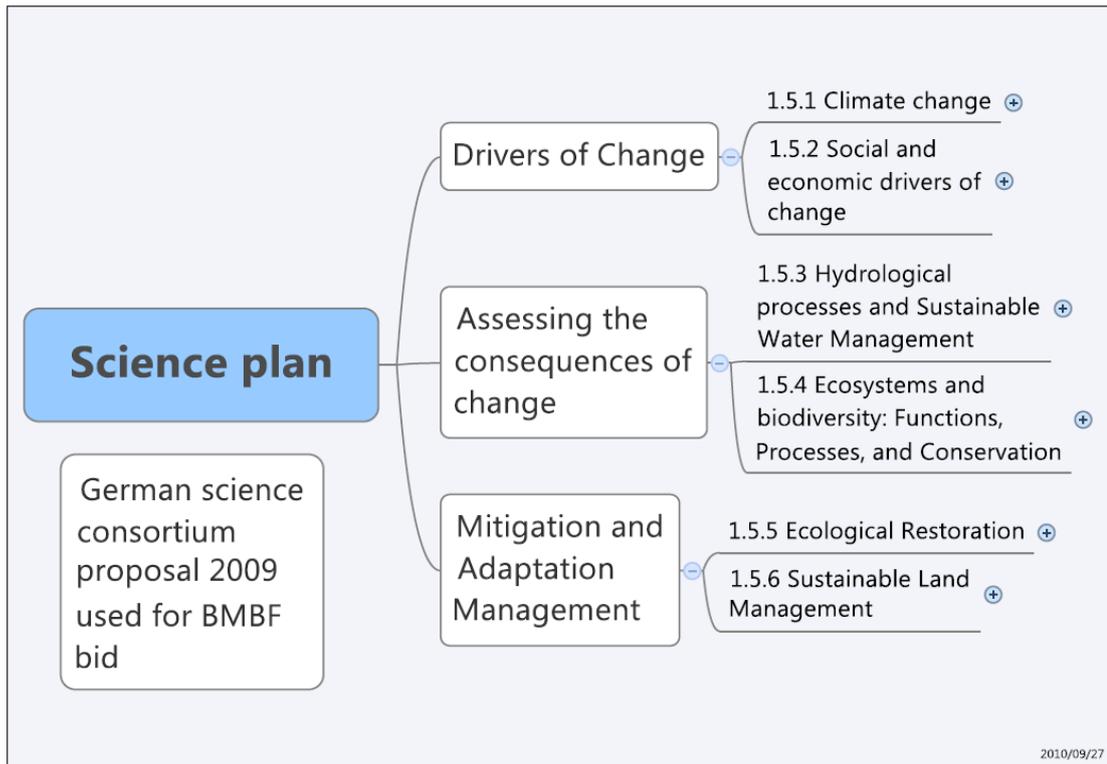


Figure 3: The major elements of the science plan as proposed by the Science Consortium

ii. [The research needs identified during the national stakeholder workshops](#)

At the national stakeholder workshops, four thematic areas were identified as clusters for the research needs identified, namely:

- Water resources,
- Forestry,
- Agricultural land-use and
- Biodiversity, wildlife and tourism

These four thematic areas are seen as a first layer to strategically focus research activities.

iii. [The proposal developed at the Technical Working Group \(TWG\) meeting](#)

The TWG, meeting from 27–29 September 2010, proposed to improve the integration of the different disciplines by focussing on a limited list of “key landscapes”. As such the following three “landscapes” are listed:

- I [Woodland](#) (Miombo in the broad sense) (including Angola, Zambia, Namibia, Botswana, South Africa, and possible wider application)
Main topics will include: ESF, ESS and their valuation, resource economics, deforestation and forest restoration, resilience and the tipping point functions of Miombo, beyond the region. Within this

“key landscape” the Zambezi-Kwando-Linyanti river basin and Kunene-Cuvelai river basin (including Angola, Zambia, Namibia and Botswana.) will be studied with regard to river basin management and land-use options ensuring adequate flow, water quality, and flood events.

II Thornbush Savanna (Arid Savanna in the broad sense, encompassing Kalahari and Nama Karoo) (including Namibia, Botswana, South Africa).

Main topics will include: Rangeland management – improving sustainable use, bush management and thinning, shared aquifers.

III Western Arid Zone (Namib/Karoo) (including South Africa, Namibia and Angola)

Main topics will include: Alternative land-use options especially on the margins – eco-tourism, wildlife, livestock, drying of Succulent Karoo and consequences for livelihoods and conservation, mining impact.

b. Activities with deliverables projected over three different time-scales:

- Fast-tracked activities (activities which can be conducted quickly within the first two years) will serve a “low-hanging fruit” function, allowing rapid product delivery and immediate visibility of the RSSC within the region and the scientific community. At the same time, they will partly contribute as a basis for the mid- to long-term activities, e.g.
 - State-of-the-Environment Situational Reports on climate change, biodiversity and other pre-determined but relevant topics for entire Region. These reports will allow for clearer demand analysis, understanding of existing research agendas and status of science, training opportunities analysis, etc.
 - Regional information sharing website(s)
 - Flood early-warning system – natural disasters
 - Regional and national level information sharing with, for example, parliamentarians
 - Branding and creating an identity for the RSSC M.Sc. and Ph.D. qualifying training support from next year onwards using existing institutions
 - Local project staff in place as part of preparation phase
 - Establishment of monitoring and measuring networks as a precondition for certain start-up phase activities
 - Mechanisms need to be agreed upon between the different countries and stakeholders to ensure a free flow of data and information, as far as this is possible without, for example, endangering the protection of endangered species. “Material transfer” protocols need also to be considered.

- Start-up Phase activities (first four years)
 - Main science plan of RSSC (still to be determined) will be implemented
- Long-term activities (first four years and beyond)
 - Significant result delivery and data outputs from the initial infrastructure investment and many of the research activities will predictably only be achieved after the Start-up Phase. The long-term perspectives of the project will be compiled and communicated in regular intervals.

c. Schedule for finalisation of the science plan

The science plan must be conceived and developed as an integral and essential component of the main funding application for the RSSC. It needs to be submitted to BMBF in February/March 2011.

6.6 Capacity building plan

At the various national stakeholder workshops, emphasis was placed on the need to provide bursaries to (especially M.Sc. and Ph.D.) students. The TWG meeting further identified the need to develop new or strengthen existing programmes, relevant to the ambit of the RSSC, at tertiary education institutions in southern Africa. An assessment of these institutions and curricula relevant to the RSSC, and options for strategically strengthening such curricula, will be conducted as a fast-tracked activity mentioned above. In addition, needs for non-academic capacity development have been identified, as well.

6.7 Products and Services

Products and Services will form an important output of the RSSC initiative with significant potential impacts at all levels. This is in line with the prominence assigned to this component by the first political Round Table, where one-third of the funding was allocated to this component.

In order for the RSSC initiative to have these impacts, science results and advice needs to be “translated” into appropriate information packages for the relevant target audiences, whether these are political decision-makers, rural farmers or school children. Equally it is not enough to make information available, but the RSSC needs to find partners to help spread this information effectively in order to create awareness and hopefully influence behaviour. Envisaged products include:

I Focused and systematic regional assessments summarising basic and applied research areas.

- Integrated regional assessments of vulnerability and risks including early warning systems
- Integrated regional assessments of the potential for mitigation and adaptation

- II Integrated regional scenario planning considering interactive changes in various socio-economic and environmental fields.
- III Support to focused and systematic planning and implementation of application of scientific results

Products and services will be delivered via the following channels:

Direct own delivery

- Publication in research/scientific journals as well as in local, popular media
- Information on environmental change and early-warning systems (floods, fires, etc.)
- Real-time (“live”) information services, i.e. weather data, flux gauge data, etc., updated hourly
- Responding to requests by ministries for background information, e.g. speeches for ministers
- Helpdesk in a city (queries by farmers, teachers, parliamentarians, ...)
- Information pamphlets
- Project overview – inventory of RSSC activities being undertaken in the region

In collaboration with stakeholders

- Guide strategy development within different line ministries
- Adaptation strategies (e.g. rangeland issues)
- Models for improved management of natural resources and decision-making on a range of related issues

Through partners

- Education programme for schools
- “EduVentures” approach, environmental education centres, conservancies
Bus info as road-show for rural communities (with lab, movies, technical examples, ...)
- Regional summer school approach

6.8 Planning

The planning of research activities, capacity building and development of products and services for the start-up phase will be done as part of the project funding proposal to BMBF. Broad partnerships should be identified at this stage between African scientists and their counterparts from the German Science consortium.

The Regional Secretariat will be responsible for reviewing this plan and more detailed annual work plans. Annual work plans will be compiled through consultations - between the research groups, the national co-ordination units and the Regional Secretariat. The results from the scenario planning as part of the science programme will influence the planning of research activities and capacity building.

6.9 Monitoring and evaluation (M&E) in relation to programme implementation

The Regional Secretariat will be responsible for M&E in relation to programme implementation and will report to the Regional Steering Committee at agreed intervals.

Two equally important broad categories need to be considered, namely:

- to what extent was this new initiative of building a true research partnership between Germany and southern Africa successful; and
- to what extent did this programme influence change within its scope of operations. .
- The indicators to measure programme effectiveness, will depend on further detailed planning, but could include:
- the extent to which research results from this programme are translated into stakeholder-relevant information;
- to what extent this information is taken up by the various decision-makers;
- to what extent RSSC activities are co-ordinated with regional stakeholders and reflected, for example, in line ministry action or strategic plans as partnership activities.

Furthermore, the number of academic trainees in the different thematic areas will be documented and an assessment made of career path development of these trainees and the benefit to the region.

7 Funding projections

7.1 Potential funding allocations

In order to guide the overall scope of the RSSC programme, the funding currently available was taken as a basis for further planning. Scenarios were developed around the cost of various activities in order to guide broad allocations. It is assumed that 50% of the “up to one hundred million Euros” would be available for southern Africa.

The funding under the scenario proposed here will be broadly divided as follows, between the following categories:

Broad category	% allocation	million €
Research, Cap. Dev & Services	75%	37.5
Infrastructure and specialised equipment	20%	10
Contingency	5%	2.5
Total	100%	50

The “Research & Services” category can be further divided between the regions as a whole and focused landscape-based research (see Section 5.3.b). Activities that would be typically funded under the “Region” category would include additional weather stations and hydrological measuring stations not limited to any of the three landscapes. Equally, regional capacity building initiatives, such as expanding/improving degree programmes, are covered under the “Region” category.

	Region		Miombo		Savanna		Namib/Karoo		million €
	%	€	%	€	%	€	%	€	Sub-total
Water	20%	3.0	20%	1.5	20%	1.5	20%	1.5	7.5
Land use	25%	3.8	25%	1.9	25%	1.9	25%	1.9	9.4
Biodiversity	15%	2.3	15%	1.1	15%	1.1	15%	1.1	5.6
Climate Change	8%	1.2	8%	0.6	8%	0.6	8%	0.6	3.0
Capacity building	16%	2.4	16%	1.2	16%	1.2	16%	1.2	6.0
Info & services	16%	2.4	16%	1.2	16%	1.2	16%	1.2	6.0
Total	100%	15	7.5	7.5	7.5	7.5	7.5	37.5	
% allocation of total funding to landscape/region		30%	15%		15%		15%		75%

For an explanation of the row headings in the above table, please refer to the relevant topics in this Business Plan, as discussed under the research plan (Section 6.5), Capacity Building (Section 6.6) and Products and Services (Section 6.7).

Finally, the “Infrastructure and specialised equipment” broad allocation is further subdivided between the countries as follows:

	Regional Secretariat	Angola	Botswana	Namibia	SA ²³	Zambia	Total
€ amount (million)	0.6	2.2	2.2	2.2	0.6	2.2	10
% allocation	6.0%	22.0%	22.0%	22.0%	6.0%	22.0%	20%

This allocation serves merely as an indication of possible fund distribution. There must be some flexibility to accommodate funding requirements articulated in final science plan (December 2010 to February 2011). Furthermore, there needs to be some flexibility for incentives which reward own engagements within the countries.

Based on the assumption that the funds for the broad category “Research, Cap. Dev & Services” and “contingency” (€ 40 million) will be administered in the region, with management costs amounting to 8% to 10% of the funds handled and that 75% of the management cost is staff cost and that the average professional staff cost is € 40 000 per annum, it follows that the RSSC could support a staff complement of 15 to 19 professional staff. The Regional Secretariat and the national co-ordination units could thus be staffed with 19 professional staff in total or their equivalent in cost (see Section 6.1.6.3)

Options to be considered concerning funding allocation

Option 1 – Funding allocation as proposed by TWG are accepted by RT – in broad terms.		
	Recommended	Not recommended
Option 2 - Funding allocation as proposed by TWG are strongly altered.		
	Recommended	Not recommended

7.2 Country contributions and sustainability strategies

² although South Africa will not build infrastructure, an allocation has been made for specialised equipment, but this is dependent on a clearly identified need

In order to make objective judgements of country contributions and RSSC programme sustainability, the project funding needs to be put into perspective by, for example, comparing it to government expenditure by relevant line ministries. In the case of Namibia, project funding has been compared to government expenditure for the three ministries dealing with the thematic areas water, land and biodiversity, wildlife and tourism.

Namibian government funding for three selected ministries for the 2010-2011 financial year⁴

(in N\$ million)	Operational Budget	Development Budget
Agriculture, Water and Forestry	819.017	666.726
Lands and Resettlement	84.896	105.3
Environment and Tourism	248.197	99.73
Total	1152.11	871.756
Converted to € million (9N\$ = 1€)	128.01	96.86
RSSC funds in Namibia		
Annual funding (€ million)	2	0.7
RSSC funds as % of Namibian government spending	1.6%	0.7%

Considering that the project funding is equivalent to 1.6% of government operational expenditure during the current financial year and 0.7% of the annual capital or development budget, government financial contributions should not be an issue, neither should longer term sustainability from a financial point of view.

(The same calculations still need to be done for the other participating countries.)

The above calculations again underline the need for the RSSC to identify a strategic niche to justify its existence, to ensure relevance for stakeholders and effectiveness in order to guarantee long-term sustainability. In this context, the RSSC needs to establish a strong network with partners contributing to the overarching national and regional development goals.

8 Implementation time-line

October 2010	The Business Plan is finalised and submitted to delegates attending the political Round Table in Luanda.
November 2010	The Business Plan is discussed by the political Round Table in Luanda, 23–24 November. Clear decisions are taken on options presented. The Business Plan is referred back to the TWG for amendments.
December 2010	The revised Business Plan is submitted to all
January-February	An initial Regional Steering Committee (Section 6.1 and Figure 2) is

⁴ MEDIUM TERM EXPENDITURE FRAMEWORK 2010/11-2012/13, accessed at www.mof.gov.na on 2010-10-07

2011	established to inter alia coordinate and initiate the setting-up of the Board, advice on the detailed research plan, requesting further input from partner and stakeholders for projects etc.
March 2011	A detailed research plan is submitted to the BMBF. The high level agreement between Germany and the African partner countries is signed.
April 2011	The Regional Secretariat is initiated. The RSSC Board is established. The legal entity is created.
	The programme enters into start-up phase

9 “Bigger picture” linkages

This initiative will contribute to several higher level national and regional development objectives, far beyond its mandate and core area of operation. For example, through the linking of research to products and services and open access data centres, this programme will help foster a knowledge-based economy in the region.

The RSSCs will contribute towards the achievement of the Millennium Development Goals (MDG) through its contributions to Goal 1: to eradicate extreme poverty; Goal 7: environmental sustainability; and Goal 8: to develop a global partnership for development.

10 Development of this Business Plan (its history)

Based on the outcomes of a TWG meeting (28–30 September 2010, held in Windhoek) attended by participants from all six RSSC countries, a first outline of a Business Plan for the start-up phase was drafted (this document, Version 1). This first draft was sent out on 12 October 2010 to the RSSC communities in all countries involved with the request to review and provide technical inputs for improvement by 25 October 2010. (Comments received up until 6 November were considered.)

The main goal of the Business Plan is to explore various issues and provide options to facilitate decision-making at the political Round Table in Luanda. Thereafter country specific views will be incorporated.