



From Projects to Peace

CRIDF's approach to identifying selecting and implementing Activities, Projects and Concepts to respond to the Logframe

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Executive Summary

Introduction

The congruence between CRIDF's Logframe and SADC's visions and goals creates opportunities for the Facility to make a real contribution, but significant challenges. CRIDF must contribute to a peace dividends impact by delivering small to medium scale climate resilient infrastructure for the poor. However, much of the infrastructure required in the SADC region, while meeting critical national demands, will have limited transboundary impacts. Most of CRIDF's projects will not be large enough to drive regional integration.

The challenges for the future are also substantial. Rapid economic growth will drive growing demands for water, food and energy; the region as a whole is likely to become increasingly water stressed. Climate change adds a complicating dimension, exacerbating the problems associated with an already variable climate. This congruence of drivers, unless carefully managed, may increase regional tensions over water in medium term. CRIDF therefore recognises that long term peace dividends lie in regional rather than sovereign water, food and energy security. This is a big ask of governments, and requires that the Facility establishes itself as a 'trusted advisor' across the region. To do this, CRIDF will have to take on a range of projects which address the needs of the host countries, which may have to be 'CRIDified' to build their contributions to the Logframe Outcome and Impact.

This 'From Projects to Peace' Strategy outlines how CRIDF will select, manage and implement projects to address this challenge. It highlights how the Facility will respond to the specific characteristics of each basin, and how thematic approaches necessary to respond to the Facility's core mandate will be built into the planning and execution of the projects. It builds on an Inception Phase Strategy primarily aimed at mobilising and profiling the Facility across SADC.

Responding to regional water challenges

A Facility model must respond to demands and needs of SADC Member States; CRIDF's response to these regional water challenges will be guided by 8 principles;

- ▶ **Principle 1:** CRIDF will select projects that meet clearly identified national, basin (RBO), or SADC needs and priorities; taking some through to implementation using internal resources.
- ▶ **Principle 2:** All CRIDF projects will be situated in transboundary basins, and the Facility will work with the host Countries and Project beneficiaries to increase the climate resilience and transboundary cooperation components of selected projects wherever feasible.
- ▶ **Principle 3:** CRIDF will select and tailor infrastructure projects to suit the water resources, developmental and water resource characteristics of the host basins.
- ▶ **Principle 4:** CRIDF will introduce the regional water, food and energy security nexus thinking through key projects and to key stakeholders, and will include all three components into its projects wherever feasible.
- ▶ **Principle 5:** CRIDF will take on water and sanitation projects that form the foundation of peace dividends, even where the immediate transboundary benefits may be limited.
- ▶ **Principle 6:** CRIDF will seek groundwater recharge and /or abstraction projects, and will build conjunctive groundwater use into projects wherever feasible.
- ▶ **Principle 7:** CRIDF will identify projects aimed at improving the ability to predict, manage and mitigate the impacts of floods through delivering infrastructure and appropriate warning and response systems.

- ◆ **Principle 8:** CRIDF will build climate proofing into the design and operation of any infrastructure it supports. The Facility will also build climate resilience through a multifaceted response covering the social, economic, and governance components of climate vulnerability.
- ◆ **Principle 9:** CRIDF will become increasingly strategic, initially being entirely demand driven, but 'CRIDifying' projects to increase their alignment with the Facility's mandate. In the longer term CRIDF will actively seek projects that maximise the contribution to the Logframe.

Basin specific approaches

CRIDF must select and tailor infrastructure projects to suit the water resources characteristics of the host basins in order to prevent unintended impacts on other water users in the basin. The Facility has identified the following focus of attention for each of SADC's transboundary basins.

Orange-Senqu:- As the primary water provider to over 30% of the regional economy, this basin is central to CRIDF's strategic vision. The water stressed nature of the basin requires a focus on stretching the available water resources further through water use efficiency and water reuse. This engagement may position the Facility to advise the development of the basin IWRM Plan.

Zambezi:- CRIDF supported infrastructure in the Zambezi Basin will aim to provide the needed water security in the parts of the basin most likely to be hardest hit by climate change and increased variability in runoff, while maximising the opportunities to improve the prediction of flows for the operation of the hydropower schemes, and improving the monitoring of runoff across the basin. The basin also provides significant opportunities to engage the water, food, energy nexus approach.

Limpopo:- CRIDF's involvement in the Limpopo Basin will focus on the value of monitoring infrastructure in promoting transboundary cooperation and climate resilience. The basin's heavily developed nature, and the fact that it is prone to flooding, makes both water quality and flow monitoring vital components to climate resilience. Recognising that monitoring infrastructure and processes are often not sustained adequately, CRIDF will aim to develop simple methods based on existing data systems.

Save:- CRIDF's involvement with the Save Basin will focus on the delivery of small scale community schemes identified in the basin planning process, and which lie in climate vulnerable hotspots. Transboundary benefits will be pursued through developing joint operating rules (agreed by both Mozambique and Zimbabwe for existing and potential new storage infrastructure, maximising the yield of the system, and assuring cross border flows even in extended droughts.

Pungwe:- Generally the basin is not water stressed, lies almost entirely in Mozambique, and there are limited opportunities for projects realising substantial transboundary benefits. CRIDF's current focus in the Pungwe Basin is on WSS provision. This recognises that this area is one of the poorest regions of SADC and is significantly underserved in this respect.

Still to be developed; Rovuma, Okavango, Cunene, Cuvelai, Inkomati, and Usutu / Maputo.

Thematic approaches

In order to deliver on its Logframe, CRIDF must also inculcate several cross cutting thematic approaches into its projects, what is referred to as CRIDifying them. These are;

- ◆ **The water, food, energy and carbon nexus;** CRIDF recognises that in the longer-term greater regional economic integration and sustained GDP growth requires action across the nexus;

sharing virtual water; reducing carbon emissions and promoting regional security in all these sectors. CRIDF will therefore look for opportunities to build all these sectors into its projects, as well as to introduce nexus thinking to the right people and the right levels and at the right time.

- **Climate Resilience**; Climate resilience lies at the heart of CRIDF's *raison d'être* and must be built into all the Facility's operations. CRIDF will take an increasingly strategic approach to this, firstly identifying what makes the project beneficiaries vulnerable, and taking specific actions to address this, then gradually moving towards specifically selecting projects in climate vulnerable areas.
- **Small dams**; The development of small to medium scale storage infrastructure is a core component of many CRIDF projects. However, the region is littered with failed dams and storage projects. The Facility will therefore address the sustainability of these structures through addressing; appropriate climate proofed design; protection of the natural infrastructure of the catchment areas; developing operating rules to cope with drought; and improving community governance;
- **Stakeholders**; CRIDF's relationships with its stakeholders is vital to achieving its desired impact. The Facility will therefore engage stakeholders at regional, RBO, national and local levels; as far as possible addressing their needs for infrastructure and therefore winning CRIDF a seat at the table. This will mean prioritising some projects, and delivering infrastructure through internal capital resources. This will enable the team to make greater inroads towards the strategic peace dividends concepts.
- **Others**; It is likely that a need may arise for several other thematic strategies as the Facility progresses with its projects. These may include the development of specific approaches to, WSS and WASH, livelihoods diversification, and gender.

Using the resources

CRIDF must spend a substantial portion of its current budget of some £ 18.2 million in its first two years. This is unlikely at the current rate of spend, and a scaled up resource use strategy is essential to ensuring the full allocation is used effectively. This has two components; firstly a plan to scale up the number of projects or assignments in the CRIDF pipeline, and secondly a plan to increase the spending on priority projects through delivering infrastructure from CRIDF resources.

The former has largely been done through the preparation of some 45 new Terms of Reference in the last month. Constant monitoring of the project pipeline to ensure that it reflects a wide geographical scope (Countries and Basins), and the range of thematic approaches will allow the team to identify gaps and address them in a timely manner.

The delivery of some infrastructure from internal capex will be driven by the consideration of the following;

- The size of the infrastructure;
- The time it will take to construct;
- The need to be seen to deliver;
- The need to exercise appropriate due diligence in the design of the infrastructure;
- The possibility of phasing the work and delivering on parts of the infrastructure; and
- The ease at which external capital financing could be found.

CRIDF will keep track of internal versus external capex through project spending plans which will form part of the Project Implementation Plan.

The Logframe

In spite of its trendy title, this strategy is simply the process CRIDF will follow to deliver on the Logframe. This will be driven initially by the regional context and SADC water challenges. The CRIDF principles

will guide this process, while the project screening tools will ensure that the appropriate rigour is applied to each project. Monitoring will ensure that the projects are geographically relevant (across basins and Member States), while the basin approaches will ensure that the projects are tailored to the water resources characteristics of the 'host' basins. The thematic approaches will ensure that the Facility responds to its mandate.

Output 3 will ensure that the stakeholders are engaged such that the Facility will deliver on the needs of the host Countries, and that key strategic concepts necessary for a sustainable impact can be introduced. Output 2 will ensure that infrastructure can be financed, while Output 1 ensures the actual delivery (perhaps outside the timeframe of the Facility) of the infrastructure. The resultant Outcomes of reduced climate vulnerability and the benefits of shared management of transboundary watercourses, will together deliver on the impact.

This will all be supported by enabling functions related to M&E, VfM, Administration, and QA processes.

Implementing the Strategy

The delivery of projects (which will ultimately lead to infrastructure) lies at the core of CRIDF's business plan. This requires a number of supporting and enabling functions and thematic approaches, as well as the selection and CRIDification of a broad mix of projects. This rests on two key tools in the CRIDF toolbox;

- The Project Screening Tools; and
- The Project Implementation Plan

The Project Screening Tools ensure that the prosecution of the projects follows a set and monitor-able pathway, and that each step is addressed with the appropriate due diligence.

The Project Implementation Plan (PIP) covers the following; The designated Technical and Commercial Project Managers; The Project Description (including host basin and Country); Why is CRIDF taking on the Project; A Rollout Plan; The Contribution to the Thematic Approaches; The Contribution to the Logframe; and The Quarterly Spend Plan (specifying internal and external capex and Technical Assistance projections).

The monitoring the collection of all these PIPs will ensure that the project pipeline as a whole responds to the Logframe, provides for a wide geographical scope, that all the thematic areas are addressed and the spending targets can be achieved.

Jargon buster and acronyms

Activities	A series of tasks that lead to the delivery of a Project .
Assignments	A series of tasks that will deliver on key Concepts or Thematic approaches to be inculcated into CRIDF projects, to support their delivery against on the Logframe and M&E indicators. These are required for the Facility to contribute to the overall impact. Sometimes called 'non-infrastructure projects'
Capex	Capital expenditure to deliver infrastructure. This may be internal (using the CRIDF budget) or externally sourced from a financier.
Climate Resilience	Any action or project at regional, national, sub-national, or local (community level) that better enables people, particularly the poor, to predict, manage, or mitigate the impacts of extreme climate events through infrastructure interventions.
Commercial Project Manager	An individual who will assume the responsibility for resourcing the Activities under the Project, and for ensuring that they deliver on time and within budget.
Concepts / Thematic approaches	Key issues central to achieving long term peace dividends, increased climate resilience, sustainable infrastructure for the benefit of the poor. These include approaches to the water, food and energy nexus, the approach to climate resilience, the approach to sustainable small scale storage, and the approach to financing.
CRIDF	The Climate Resilient Infrastructure Development Facility.
CRIDify	The process of increasing the climate resilience, pro-poor, transboundary, or strategic dividends in a Project. It can also be used to describe the process of inducting new comers to CRIDF, so that they understand the goals, procedures and functioning of the Facility.
GWP	Global Water partnership - A key NGO partner to CRIDF.
ICP	International Cooperating Partner - Agencies that provide financial and technical support to SADC, RBO's or Countries.
PIP	Project Implementation Plan – prepared at the end Screen 2a, to guide the prosecution of the projects through the screening process; to CRIDify them; to outline a quarterly spending plan. Collectively these provide the opportunity to manage the project pipeline or programme.
Projects	A series of CRIDF supported Activities that will ultimately lead to the delivery of infrastructure, (within of beyond CRIDF's lifetime), or the improved operation of existing infrastructure. Also referred to as 'infrastructure projects'
Project Pipeline / portfolio	The collection of all the projects (having passed Screens 1 and 2a). Management of this pipeline constitutes the Programme.
RBO	River Basin Organisation. A body made up of members from more than one country with a mandate to develop basin plans and make recommendations to its Parties.
RSAP 3	SADC's third Regional Strategic Action Plan for water.
SADC	Southern African Development Community.

Technical Project Manager	An individual in the CRIDF PMU who will assume the responsibility and accountability for ensuring that the project delivers on the Logframe, and the 'From Projects to Peace' strategy.
VfM	Value for Money – the process that ensures CRIDF delivers the in the most effective, efficient and economical way. Delivering a quality product, which addresses the needs at the lowest price.
WASH	Water, sanitation and Hygiene – The collection of WSS infrastructure and behaviours required to minimise health risks to communities.
WSS	Water and Sanitation Services. The technical assistance and infrastructure needed to provide water and sanitation domestic users.

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1. Introduction

1.1 A congruence CRIDF & SADC objectives

CRIDF's Logframe outlines its intended Impact as;

“Peaceful and climate resilient management of shared water resources in SADC for the benefit of the poor.”

Operating in SADC's mainland States, CRIDF is a regionally, and specifically SADC, focussed Facility, drawing its strategic direction from SADC's vision of;

“A common future, a future within a regional community that will ensure economic well-being, improvement of the standards of living and quality of life, freedom and social justice and peace and security for the people of Southern Africa.”

and the southern African Water Vision of;

“Equitable and sustainable utilisation of water for social and environmental justice, regional integration and economic benefit for present and future generations”.

CRIDF's aim to build regional peace dividends through improved cooperation on transboundary waters is closely aligned to these regional visions.

The growing calls for urgent action to address the needs of the poor and the SADC IWRM - Regional Strategic Action Plan 3 (RSAP 3) emphasis on climate resilient development is mirrored in the Facility's focus on climate resilient pro-poor infrastructure delivery in its Output 1;

“RSAP-aligned small-scale climate resilient water infrastructure, targeting the poor, planned and implemented in shared watercourses.”

The Facility's Outputs 2 and 3;

“Investment leveraged for projects brought to bankability”, and

“Stakeholders engaged and supported around inclusive water infrastructure development processes”

provide the mechanisms to ensure substantial delivery of infrastructure across SADC that meets the needs of key stakeholders, beyond its internal financial resources.

This congruence of objectives, outputs and impacts creates opportunities for the Facility to make a real difference; but also significant challenges. CRIDF must contribute to a strategic peace dividend vision by addressing immediate needs through small and medium scale infrastructure. In many cases this infrastructure, while potentially holding pro-poor and climate resilience benefits, may not have significant transboundary impacts. Almost all CRIDF projects will not be large enough to be regionally significant, supporting integration across the whole sub-continent.

National demands for infrastructure also generally focus on sovereign actions and needs. While there are some projects that are transboundary in nature, these are relatively few in number and often already supported. Many projects identified through interaction with stakeholders are therefore unlikely to hold substantial opportunities for boosting transboundary cooperation. There is, nonetheless, a significant commitment to collaboration around shared waters across the whole of SADC; and hence a receptive environment for 'expanding' national infrastructure projects to build

transboundary cooperation. However, the vision for lasting peace dividends remains just that; a long term intention which is not being specifically driven through infrastructure development.

The challenges for the future are also significant. Economic growth in many SADC countries will drive rapid demographic change and growing demands for water, food and energy. Three of SADC's Member States are expected to be in the top 10 fastest growing economies in the world over the next decade; generating even higher demands for water, food and energy. Climate change adds a complicating dimension, exacerbating the problems associated with an already variable climate. Climate change scenarios suggest that the wetter areas may get wetter, and the drier areas drier. Shortened growing seasons may threaten food security for the very poor, while more frequent flooding will have devastating impacts.

Further complicating dimensions lie in the fact that southern Africa is being targeted for foreign land acquisition, ultimately contributing to the export of virtual water out of the region. Many countries in SADC, faced with increasing international oil prices, are also increasingly pursuing biofuel production supported by irrigation. Long term plans to ensure water security in the south through transferring water from the wetter north may create further challenges. This congruence of drivers, unless carefully managed, may increase regional tensions over water in medium term.

In this context CRIDF will have to show that, particularly in the face of climate change, long term peace dividends lie in regional rather than sovereign water, food and energy security. However, Governments facing growing demands for water, food and energy may be hesitant to find this security through regional integration – particularly before greater economic integration is a reality. Moreover, projects that hold inherent climate resilience benefits through this nexus are not common, and usually involve large infrastructure. Large scale regional infrastructure like the Lesotho Highlands Phase II, Inga III, and Batoka Gorge Schemes, all of which have the potential for building regional peace dividends and catalysing greater integration, generally lie beyond CRIDF's means and are too long term.

The Facility therefore recognises that securing wider regional peace dividends needs more than improved cooperation in transboundary basins through small and medium scale infrastructure; it requires regional integration around a water, food, energy, and carbon nexus; and the transport, energy and water infrastructure that supports that integration. Quite simply, peace dividends require that the benefits of regional security across several sectors must far outweigh the benefits of sovereign security in each individual sector. This may require a significant shift in thinking, and can only be done if CRIDF is seen as a 'trusted advisor'. This will form an important component of how the Facility will roll out its projects.

This 'From Projects to Peace' Strategy outlines how CRIDF will select, manage and implement its projects to address these challenges. It highlights how the Facility will respond to the specific characteristics of each basin, and how thematic approaches aimed at increasing the contribution to the Facility's core mandate will be built into the delivery of the overall Programme – ensuring that the collection of all its projects makes a substantial contribution to its intended impact

1.2 The start-up approach

CRIDF had a 3 month inception period, which necessitated the development of an "inception phase strategy". This inception strategy aimed to rapidly mobilise the team, initiate work on projects seen

as priorities in regional or transboundary plans, and to introduce stakeholders to the Facility. This process, while necessary for speedy delivery and acquaint stakeholders with CRIDF and its comparative advantages, was not done within any clearly articulated strategy for delivering on the as yet to be prepared Logframe.

Nonetheless, this inception strategy proved remarkably successful, identifying some 35 projects which may eventually lead to the delivery of infrastructure across SADC – while some 30 further supporting assignments were initiated. This pipeline or portfolio of work has to some extent set the basis for this strategy and identified the initial set of projects the Facility will be working with.

This Projects to Peace Strategy builds on this earlier work, and is as much about how the existing project portfolio and individual projects will be CRIDfied, as it is about how new projects will be identified managed and delivered to maximise their contribution to the Logframe and Impact.

1.2 The purpose of this note

The challenge facing CRIDF lies in contributing to its strategic vision for improved transboundary cooperation and regional peace dividends through demand driven small and medium scale infrastructure mostly addressing needs in one country.

This note outlines how the Facility will do this by summarising;

- The regional water situation, forming the basis for water relevant strategies (Section 2);
- Approaches relevant to the water resource characteristics of each basin (Section 3);
- Thematic approaches to address key challenges in the region, and CRIDF's mandate (Section 4);
- Approaches to fully utilise the available resources in a responsible manner, winning the confidence of stakeholders and establishing the basis for a longer-term Facility (Section 5);
- The approaches for aligning with the Logframe (Section 6); and
- An overall Projects to Peace Strategy to inculcate these ideas into the selection and management of projects, as well as how they will collectively deliver on the Logframe (Section 7).

The 'From Projects to Peace' Strategy has been based on the 4 year lifetime for CRIDF, but recognises that an extended timeframe building may be required to make substantial progress on larger projects that make seminal contributions towards regional peace dividends.

2. Addressing key water challenges in SADC

2.1 Background

This section summarises the water situation in SADC. This is used to distil Principles which will underlie the selection and implementation of CRIDF projects to ensure that they remain relevant to the challenges and needs in SADC.

SADC Water in a nutshell

- 💧 **70% of the region's surface water resources are found in 15 shared Watercourses.**
- 💧 **Water resources are unevenly distributed across the region, with abundant water in the north and significant water stress in the southern basins.**
- 💧 **Large storage infrastructure to help address this variability is mostly confined to Namibia, South Africa and Zimbabwe.**
- 💧 **Less than 5% of annual renewable flows across the region are stored.**
- 💧 **Groundwater is the main the source of water for 70% of the rural population**
- 💧 **More than 98 Million people do not have access to safe drinking water**
- 💧 **Close to 154 million people do not have access to improved sanitation facilities**
- 💧 **Most basins are prone to floods, droughts and water-related diseases such as cholera and malaria.**
- 💧 **Climate change is expected to have significant impacts on the sub-continent, with wetter areas getting wetter, and drier areas dryer. The heavily water dependent and developing nature of the region's economies makes most SADC countries particularly vulnerable.**

(Modified from SADC's RSAP 3)

2.2 Delivering on demands

A facility model must be demand driven in order to operate effectively. There is considerable demand for small-scale water infrastructure in all the CRIDF Countries, and most of the Facility's beneficiaries see CRIDF as an opportunity to deliver this infrastructure. Responding to, and meeting, these demands is a critical component of securing a 'political licence to operate' in the focus countries. CRIDF will therefore fund some small-scale infrastructure from its internal resources to guarantee delivery in a shorter timeframe; highlighting the Facility's ability to deliver and cementing its position as a trusted advisor.

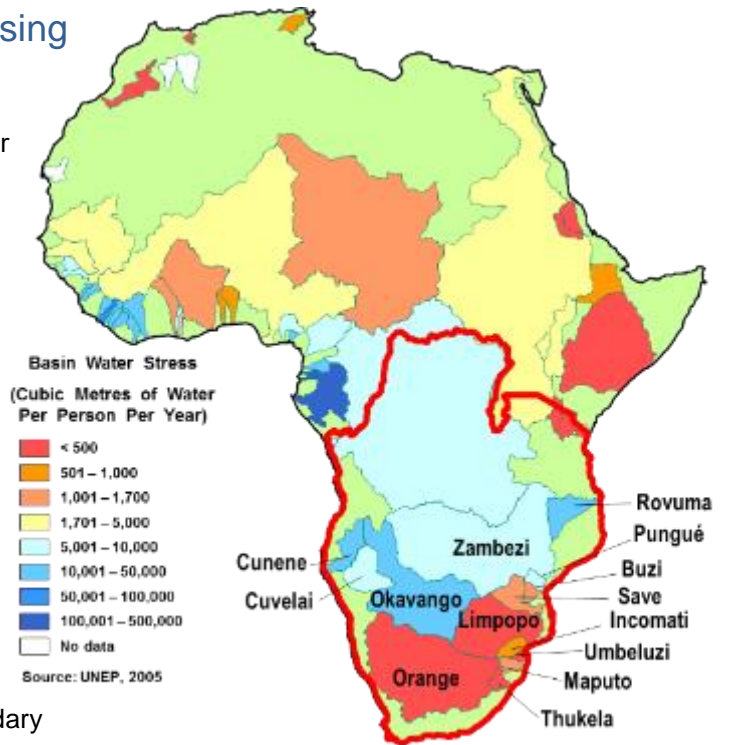
CRIDF will therefore take on projects, which address key water challenges in SADC, and the basins where they are located; but which do not necessary provide immediately obvious transboundary or strategic benefits. However, wherever possible opportunities to increase transboundary cooperation will be introduced through innovative approaches to project implementation.

Principle 1: CRIDF will select projects that meet clearly identified national, basin (RBO), or SADC needs and priorities; taking some through to implementation using internal resources.

2.3 Approaches to increasing transboundary cooperation

SADC's water resources are characterised by their predominantly transboundary nature, with 70% of the region's surface waters found in 15 transboundary basins. Six of the CRIDF focus Countries are land-locked and fall entirely within transboundary basins. CRIDF's focus on SADC's transboundary basins is, therefore, geographically and water resources relevant; as well as consistent with the Facility's focus on transboundary cooperation. However, given CRIDF's strategic objective for peace dividends, only those projects in transboundary basins will be selected.

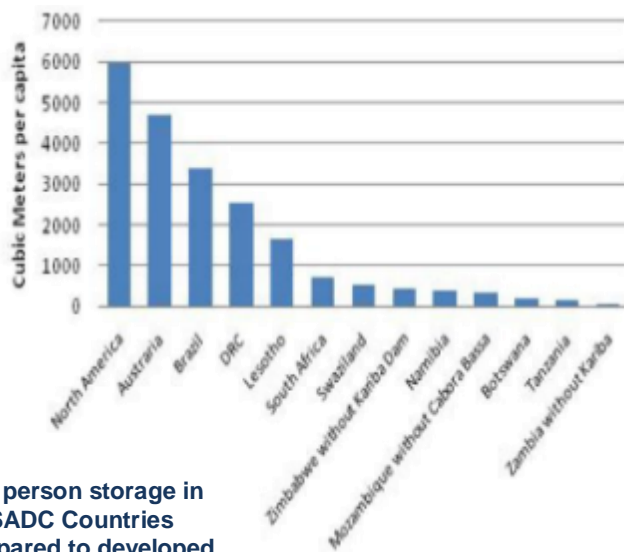
However, CRIDF will work with the beneficiaries to increase the climate resilience and transboundary cooperation aspects of these projects.



Water Stress in transboundary basins in Africa

Principle 2: All CRIDF projects will be situated in transboundary basins, and the Facility will work with the host Countries and Project beneficiaries to increase the climate resilience and transboundary cooperation aspects of selected projects wherever feasible.

Transboundary basins in SADC differ significantly in their water resources characteristics. All of SADC's transboundary basins are to some extent characterised by internal variability in runoff and water availability. However, the dominant characteristic is widely varying water availability between the basins;



Per person storage in SADC Countries compared to developed regions.

ranging from less than 500 m³/person/a in the Orange-Senqu and Limpopo Basins to over 5,000 – 10,000 m³/person/a in the Okavango and Rovuma Basins. The most water stressed basins are also the most developed in terms of water infrastructure, with significant storage (relative to runoff) in the Orange-Senqu, Limpopo and Save Basins. Yet less than 5% of the region's total runoff is stored, considerably less than the developed regions of the world.

Water storage can confer climate resilience and help cope with drought, and increased water storage is outlined as Operational Objective 2.2 – lying at the intersection of Climate Change Adaptation and Infrastructure development in SADC's RSAP 3. However, where there is

already considerable storage relative to the runoff, the benefits of increasing storage reduce, and the risks of accumulative impacts from many small dams increases. Storage projects in these basins may confer climate resilience on some communities at the expense of those downstream potentially raising transboundary concerns.

CRIDF will therefore seek projects which;

- Help stretch the available water resources further,
- Improve the joint operation of storage across borders, and/or
- Address floods

in the; Orange-Senqu; Inkomati; Save; and Limpopo Basins.

Examples of this kind of project would be the Limpopo Monitoring, Rheoboth Effluent Reuse, various Water Demand Management Projects, Save Reservoir Operating Rules, the Ressano-Garcia and the Vaal-Gamagara Projects. Some of these projects will be used to help shift thinking from transboundary water apportionment and agreed flows, to transboundary operating rules; a significant step towards greater cooperation and regional peace dividends.

In the well watered basins; the Zambezi; Pungwe; Rovuma; Okavango; Cunene and Cuvelai - increased storage to provide for greater water, food and energy security and to address poverty is less risky. In these basins the Facility will seek projects that:-

- Confer climate resilience and pro-poor benefits through small scale storage infrastructure;
- Provide greater water, food and energy security, and
- Water and sanitation provision (These basins have the greatest WSS deficits).

Principle 3: CRIDF will select and tailor infrastructure projects to suit the water resources, developmental and water resource characteristics of the host basins.

In all basins, the Facility will look to increasing transboundary benefits through improved monitoring, and sharing these data across borders. This may lead to the delivery of cross-border monitoring infrastructure, or opportunities to manage infrastructure to address the water quality and aquatic environmental health issues identified through monitoring, support to ORASECOM's Joint Basin Survey 2 and the Limpopo Monitoring project are cases in point.

Similarly, opportunities to share the benefits through selling water embedded in food and energy products across borders will be identified wherever feasible. Current examples of this kind of project are the Ruhuhu Valley Multipurpose Scheme; and work in the Okavango and Rovuma Basins to contribute to basin development strategies. More details on the Facility's approach to the water, food, and energy nexus are to be found in Section 4.2.

Principle 4: CRIDF will introduce the regional water, food and energy security nexus thinking through key projects and to key stakeholders, and will include all three components into its projects wherever feasible.

The Facility also recognises that the region is littered with failed small scale irrigation and water supply projects, and so special attention will be paid to the viability and sustainability of CRIDF projects. CRIDF will therefore develop a 'small-dams strategy' as one of its cross cutting thematic strategies (see Section

4.4). This will aim to inculcate managing the natural infrastructure of the catchment areas of small dams into dam operating strategies.

2.4 Approaches to considering WASH

SADC Countries suffer considerably from basic water supply and sanitation deficits. Some 98 million people do not have access to treated and safe water supplies, while some 154 million lack adequate sanitation facilities. World-wide this is the single biggest cause of infant mortality, and has devastating impacts on the poorest people of the region, with Zimbabwe recording over 100,000 cholera cases and over 4000 deaths in 2009. An increasingly connected population makes this one of the most important social and political issues in the region, and South Africa already experiences frequent service delivery protests. Effective service delivery is likely to be increasingly important to social stability, and hence politically relevant across SADC in the coming years.

Sustainable peace dividends cannot be achieved without social stability and political systems that are responsive to the peoples' basic needs. CRIDF will therefore place water and sanitation infrastructure high on its agenda, in spite of its limited transboundary impacts. The Facility will consequently respond to the most urgent WSS infrastructure needs, winning confidence in our stakeholders, even if the transboundary benefits are not significant. Nonetheless, CRIDF recognises that basic water sanitation and health WASH delivery can in some cases be a transboundary issue; - meeting vital human needs is the first step in ensuring the reasonable and equitable apportionment of water, and building this into WSS infrastructure and transboundary plans will become an increasingly important component of securing sustainable peace dividends. The Vaal-Gamagara is a case in point, and the Facility will similarly aim to increase the transboundary impacts of any WSS projects that lie close to borders, such as the Ressano-Garcia weir.

While the provision of basic water and sanitation services goes a long way towards reducing the transmission of faecal-oral and water-washed diseases there is also a need to include consideration of other disease-prevention activities in water resources and irrigation activities. Dams and weirs can provide ideal breeding and transmission sites for Malaria and Schistosomiasis, and engineering, management and public-health interventions will be included in all projects of this type to avoid contributing to their spread.

Re-use of treated human waste in food production is a long neglected activity in Africa, and provides opportunities to stretch limited water resources further. However, this opens the possibility of spreading infectious diseases if the infrastructure is not designed operated and maintained to a suitably high standard. The Facility's activities in the Rehoboth Project are aimed at this aspect.

Principle 5: CRIDF will take on water and sanitation projects that form the foundation of peace dividends, even where the immediate transboundary benefits may be limited.

2.5 The approach Groundwater and transboundary aquifers



**Transboundary
Aquifers in SADC**

Groundwater is an often ignored source of water to meet growing demands, yet some 70% of rural communities in SADC rely on groundwater for their basic needs. Groundwater offers opportunities to increase climate resilience, enabling countries to ‘store’ water through artificial recharge avoiding increased evaporation losses associated with higher temperatures. Many of SADC’s aquifers are transboundary in nature. Used conjunctively with surface waters, groundwater in these areas can secure water supply in extended droughts conferring climate resilience. However, groundwater recharge, or conjunctive use of surface and groundwater, projects are rare.

In addition many rural community supplies have been designed and constructed using long-term average groundwater availability data. Experience in South Africa in the early 1990s showed that even relatively deep water supply boreholes (70m to 90m) were drying up. This may become more relevant under climate change. In transboundary aquifers overuse in one country may compromise users in neighbouring countries. The climate resilience and transboundary aspects of infrastructure to utilise groundwater will therefore be

a critical component of sustainable groundwater use in transboundary basins.

CRIDF will work with Countries planning to further exploit transboundary aquifers to develop appropriate joint operating rules. There are at present no suitable projects in CRIDF’s portfolio, and the Facility will actively seek groundwater projects.

Principle 6: CRIDF will seek groundwater recharge and /or abstraction projects, and will build conjunctive groundwater use into projects wherever feasible.

2.6 The approach to floods

The risks posed by floods may be one of the most devastating impacts of climate change in SADC. Over the last 20 years the region has suffered a number of floods usually considered to have a return period of less than one in 100 years. Over the last 45 years the Limpopo Basin alone has experienced 9 major floods.

SADC, and many donors, are therefore increasingly focussing on flood mitigation projects, either through increased flood warning, improved flow monitoring, and climate proofing infrastructure (including storage, transport, refuge, and WSS infrastructure. Nonetheless, despite the relatively congested area, there are opportunities for the Facility to make a valuable contribution playing to its particular strengths of being able to quickly mobilise support for any infrastructure in multiple countries, and to develop ‘appropriate technology’ approaches to flood warning based largely on existing data systems. The Limpopo Monitoring project is a case in point.

Principle 7: CRIDF will identify projects aimed at improving the ability to predict, manage and mitigate the impacts of floods through delivering infrastructure and appropriate warning and response systems.

2.7 The approach to climate change

The delivery of climate resilient infrastructure lies at the heart of CRIDF. All infrastructure supported through the Facility will therefore be ‘climate proofed’, ensuring that it remains viable for its intended purposes both in extended droughts (or longer dry seasons) as well as being able to cope with potentially higher floods. This will be done both through the design of the infrastructure itself, as well as in the operation of the infrastructure to maximise water availability by developing appropriate and socially just curtailment rules to deal with water scarcity. This will include mechanisms to maintain environmental flows and meet the needs of users further downstream – increasing the geographical scope of any benefits that may accrue from the infrastructure, potentially across borders.

The Facility will also specifically address climate vulnerability both by examining why beneficiaries of CRIDF projects are vulnerable and addressing these aspects, but also gradually through the identification of new projects in climate vulnerability hotspots. The Facility’s approach to climate resilience is outlined in more detail in Section 4.3.

Principle 8: CRIDF will build climate proofing into the design and operation of any infrastructure it supports. The Facility will also build climate resilience through a multifaceted response covering the social, economic, and governance components of climate vulnerability.

2.8 Conclusion

CRIDF will have to take on a broad variety of projects to cover the range of water challenges in SADC. All of these projects must ultimately support CRIDF’s mandate and must contribute to the Logframe. However, the main focus of these projects may differ. Some will address immediate national needs to address poverty and creating a ‘political licence to operate’; establishing CRIDF as a trusted advisor. Others may provide opportunities to increase transboundary cooperation. Some may emerge from plans to reduce climate vulnerability.

However, few projects would hold immediate potential for transboundary cooperation and regional peace dividends. The Facility will therefore have to work with stakeholders to build these aspects into the projects; “CRIDifying” them as they progress. In the longer term the Facility will start actively seeking projects more directly aligned with its mandate by monitoring how the project portfolio as a whole addresses key thematic challenges.

Principle 9: CRIDF will become increasingly strategic, initially being entirely demand driven, but ‘CRIDifying’ projects to increase their alignment with the Facility’s mandate. In the longer term CRIDF will actively seek projects that maximise the contribution to the Logframe.

3 Basin Specific Approaches

3.1 Background

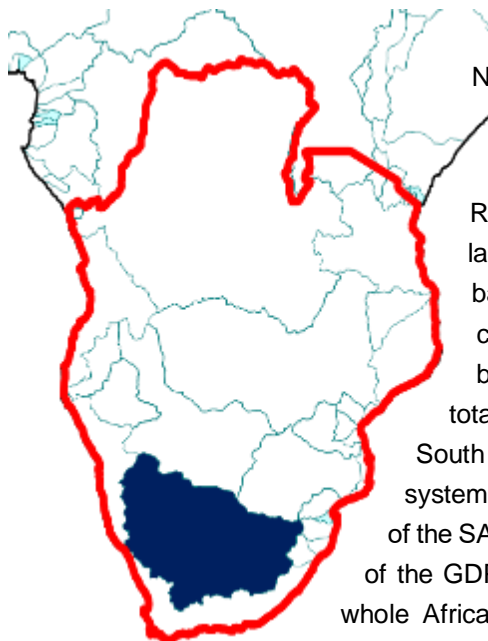
Principle 1 requires that CRIDF projects must support national or basin (RBO) identified needs and priorities. Principle 3 requires that CRIDF must select and tailor infrastructure projects to suit the water resources characteristics of the host basins. The Facility will consequently, in addition to its regional approach addressing SADC water challenges, also develop specific approaches for its target basins. These will be developed firstly by engaging the transboundary RBOs and SADC to identify specific needs, and then using this platform to develop basin specific approaches in collaboration with the RBOs.

This will not only help carve a niche for the Facility in what is often a congested donor space, but will ensure that infrastructure development is aligned with the basin water resources characteristics – avoiding perverse outcomes. This will also allow the team to contribute to the wider donor dialogue in SADC in a meaningful way.

This section summarises the key characteristics of the basins, which are used to outline an initial focus of attention in each basin.

3.2 The Orange-Senqu Basin

3.2.1 Basin description



The Orange-Senqu River Basin is shared by Botswana, Lesotho, Namibia and South Africa. It is the third largest in SADC, after the Zambezi and the Congo, and the second largest of the CRIDF focus basins.

Runoff, water use, population, and land areas vary widely across the basin. Lesotho, the most upstream country falls entirely within the basin and contributes over 40% of the stream flow from only 4% of the

total basin area, but is one of the smallest users of water from the basin.

South Africa is by far the biggest user of water from the Orange-Senqu River system, using up to 98% of the water. This use drives the economic heartland of the SADC region, and South Africa's Gauteng Province provides some 30% of the GDP of all four Member States combined, and 10% of the GDP of the whole African continent – making the Orange-Senqu a strategically important basin for CRIDF.

%	Land	Runoff	W/use	Pop.
Botswana	8	0.3	<0.4	0.3
Lesotho	4	41.5	0.4	15.5
Namibia	24	5.2	1.4	2.5
South Africa	64	53	98.2	81.7

In South Africa, the basin receives inter-basin transfers from the Inkomati and Usutu systems, shared with Mozambique and Swaziland, and from the Tugela system. Water is also transferred out of the basin to the Limpopo system as urban return flows from the Gauteng and Rustenburg regions. While the Gauteng region receives electricity (and hence virtual water) generated at the Cahora Bassa Hydropower Project in the lower Zambezi. The 'footprint' of the basin therefore includes a large portion of the sub-continent – making this perhaps the most complex basin in SADC.

The part of the basin in Botswana is entirely covered by the Kalahari Desert with very little surface runoff and this region is sparsely populated. Groundwater contributes to the water demands in this portion of the basin but this water is saline and water tables are dropping. Botswana is faced with growing demands in this region with few options to address these demands. The water requirements in the lower reaches of the river are driven primarily by irrigation demands from both Namibia and South Africa, as well as the need to maintain environmental flows to the estuary. The middle and lower reaches of the river are subject to periodic and often devastating floods.

The Orange-Senqu River Commission (ORASECOM) was one of the first to be established in SADC, and has its origins soon after Revised SADC Protocol on Shared Watercourses was adopted. It is also the only transboundary RBO in SADC that receives the required contributions from all the Member States on a regular basis – testimony to its perceived value to its Parties.

The water resources of the Orange-Senqu Basin have been virtually fully allocated, while any future potential increase in yield for the system as a whole is largely tied up in the Lesotho Highlands scheme. Nonetheless, Botswana, Lesotho and South Africa have recently established a MoU aimed at investigating options for Botswana to get water from Lesotho, through South Africa. ORASECOM is also finalising a Basin-wide IWRM Strategy that should develop options to reconcile increasing water demands with limited availability well into the future. The reasonable and equitable use of water in this basin is therefore likely to become increasingly important.

3.2.2 CRIDF involvement

As the primary water provider to over 30% of the regional economy, this basin is central to CRIDF’s strategic vision for regional water, food and energy security. The Facility must consequently remain fully engaged in this Basin. The water stressed nature of the basin means that CRIDF supported infrastructure must focus on stretching the available water resources further through water use efficiency and water reuse. Engagement with the Commission and its Member States may earn a seat at the IWRM planning table, and positioning the Facility as a responsive and trusted advisor to ORASECOM may allow for the introduction of water food and energy nexus thinking into this regionally significant basin.

CRIDF is currently engaged in the following projects in the basin;

Quick Wins		Description
QW 5	Maseru WDM	<p>What: This project involves the installation of WDM infrastructure in Maseru. While this will not necessarily appreciably improve water availability for the whole basin, it will hold considerable benefits for Maseru, improving water supply to the poor. WDM may have knock on benefits in supporting environmental flows and water quality in the border. Expansion of the initial work may include operating the storage in Lesotho to improve water quality in the shared border river. The project can also provide a practical demonstration which can be used to spread the experiences further across the region.</p> <p>Why: This project has strategic value for CRIDF through its relationship with ORASECOM who is strongly supportive of the work. It is the only current CRIDF Project in Lesotho – helping establish the Facility in this Country, and provide a ‘seat at the table’ for discussion of the operation of the Metolong Dam and Caledon offtakes for Maseru.</p>
Focal		Description
FP 12	Regional WDM Pilot	<p>What: This RSAP-3 project aims to support water demand management in selected towns in South Africa. CRIDF may support these projects in areas where the ‘saved’</p>

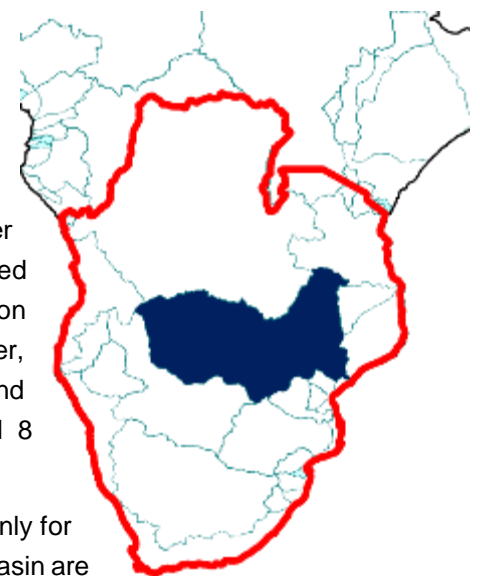
		<p>water could address a transboundary issue. If successful, the project have strong pro-poor impacts in South Africa be replicated throughout the region.</p> <p>Why: This project is being undertaken at a scoping / eligibility level to determine what volumes of water could be saved in transboundary basins in South Africa, and which could be made available across borders. This is more likely to add into other CRIDF initiatives in the Inkomati, Limpopo and Vaal-Gamagara, rather than supporting wide scale WDM activities across South Africa.</p>
FP 14	Rebboth Effluent Reuse	<p>What: This project emerged from engagement with ORASECOM and involves the upgrading of effluent treatment works in the town of Rehoboth in southern Namibia, to enable the reuse of effluent for irrigation by poor communities. This project provides the opportunity to stretch the limited resources of this very arid part of the Orange-Senqu Basin, which is expected to suffer considerably under climate change. CRIDF has received a letter of request from the Government of Namibia to prioritise this project.</p> <p>Why: This project was largely brokered by ORASECOM, and it is important for the Facility to be responsive to this need to enable engagement on the basin wide planning process.</p>
Strategic		Description
SP 4	Vaal Gamagara Pipeline	<p>What: The Vaal-Gamagara pipeline runs from the lower Vaal River in the Orange-Senqu basin, northwards stopping just short of Botswana. Botswana has proposed the extension of the pipeline to supply southern Botswana. Buy-into an existing upgrade of the pipeline in South Africa provides a considerably cheaper way to get water into Botswana. This potential project would link to WDM in towns on the pipeline, aiming to provide the saved water to Botswana.</p> <p>Why: This project has significant benefits through showing that cooperation on water supply infrastructure delivery holds transboundary benefits, and hence has showcase value. It also changes the negotiating dynamic between the ORASECOM Member States, setting the groundwork for future discussions when there are no further options to augment supplies in South Africa. This provides the opportunity for the Facility to show that taking a regional, water, food, and energy security approach could hold longer-term peace dividend advantages.</p>

3.3 The Zambezi Basin

3.3.1 Basin description

The Zambezi is the largest and most transboundary of the SADC basins, covering an area of 1.4 million km² and lying across 8 SADC States; Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zambia and Zimbabwe. Negotiations to establish ZAMCOM date back two decades, discussions were initiated in the 1980's, eventually culminating (after having been halted to finalise the revised SADC Protocol on Shared Watercourses) in the signing of the Agreement to establish the Commission in July 2004. The ZAMCOM Agreement came into force, seven years later, in June, 2011 after 6 of the eight Riparian States ratified the Agreement and deposited the instruments of ratification at the SADC Secretariat. All 8 riparian States have now ratified the Agreement.

Some 20% of the basin's water resources (average runoff) are used, mainly for hydropower (through evaporation). However, the water resources of the Basin are unevenly spread over 13 sub-basins. Evaporation by the two main hydropower reservoirs Kariba and



Cahora Bassa is the largest single water use (16%), followed by irrigated agriculture (1.4%). Total water use in the basin is expected to increase to some 40% of the average runoff by 2025 mainly through further hydropower development. These water uses do not include the potential environmental demands of the river and its delta. Reduced and altered flow regimes have already reduced the freshwater and marine shrimp fisheries in the Zambezi Delta.

Nonetheless, the Zambezi IWRM plan indicates that further development of the water resources is feasible – provided that this is approached with caution. Because of the uneven distribution of runoff, the already high and increasing variability in this runoff, increased water use may lead to temporary water shortages in certain areas. Water quality is at risk because of discharges from urban, mining and manufacturing centres.

The Zambezi IWRM Plan also indicates that water resources planning must consider floods and droughts, as well as alterations to the natural flow regimes and catchment degradation. In response, the Basin Countries are defining environmental flow requirements for the mainstream. The Plan notes that the main challenges are to quickly increase power production to sustain economic development in the riparian Countries, and increase food production in a globally competitive market through promoting multiple use reservoirs. Projects in the Zambezi Basin will therefore be a key component of CRIDF’s water, food and energy nexus thinking.

The Basin Strategy is constructed around four challenges;

- Integrated and coordinated water resources development;
- Environmental management and sustainable development;
- Adaptation to climate variability and climate change; and
- Basin-wide cooperation and integration.

3.3.2 CRIDF involvement

CRIDF is well placed to make a critical contribution to the overall basin strategy, primarily by helping the ZAMCOM Member States increase both food and energy production through infrastructure development, while remaining cognisant of the need to maintain environmental flows and protecting the feeder catchments. CRIDF supported infrastructure in the Zambezi Basin will aim to provide the needed water security in the parts of the basin most likely to be hardest hit by climate change and increased variability in runoff, while maximising the opportunities to improve the prediction of flows for the operation of the hydropower schemes, and improving the monitoring of runoff across the basin.

This will win the Facility an important ‘seat at the table’ both to introduce the strategic vision for water, food and energy security; when new large hydropower schemes move closer to fruition. CRIDF currently has the following projects in the Zambezi Basin;

Quick Wins		Description
QW 1	Mashili Small Dam resilience and information sharing project	<p>What: This project will use existing storage capacity to irrigate new areas and then develop/showcase data sharing for small-scale farmers and other river-basin stakeholders to improve climate resilience.</p> <p>Why: This project may be combined with the Zambia CCAP work. Together these projects contribute to the overall ‘small-dams’ strategy, and show how Zambia can further develop their water resources while considering the basin wide implications.</p>
Focal		Description

FP 1	Ruhuhu Multi-purpose Climate Resilience project	<p>What: CRIDF will enhance this RSAP-3 project by developing it into a multi-purpose programme addressing the water food and energy mix. Project includes provision of renewable energy to the region (hydro), improved water and sanitation, improved regional transport links, irrigation development and improve transboundary co-operation.</p> <p>Why: This project is seen as a SADC priority. The multipurpose nature of the project provides the opportunity to introduce the nexus thinking, and is hence an important showcase project. It will provide the opportunity to take a project through the notification process to demonstrate the value of the various legal instruments to promote peaceful cooperation.</p>
FP 9	12 Towns Water Supply (2 CRIDF sites)	<p>What: This RSAP-3 project aims to provide sustainable and equitable access to safe water supply and proper sanitation in 12 border towns in Zambia. This will be achieved through establishing 6000 new boreholes, (having re-habilitated 3,500 of these) and constructing over 300 latrines.</p> <p>Why: While the project has an immediate Zambian focus, potentially the project could be extended to provide WSS to people on both sides of the border. CRIDF will participate with other development partners on 2 of the sites. This project is still at the eligibility stage.</p>
FP 11	CCAP Southern Zambia	<p>What: Situated at six sites in the Zambezi Basin, this RSAP-3 project builds on existing support to building climate resilience through small scale water supply / irrigation schemes for poor communities. CRIDF will explore the feasibility of delivering infrastructure at those sites for which funding has not yet been secured, with associated monitoring to improve the operation of the storage and sharing the data with downstream users. CRIDF may also provide immediate support to ensure that a reservoir currently under construction is climate proofed, and that provisions have been made for environmental / base flows.</p> <p>Why: Like Mashili these projects will show that reasonable equitable, and climate resilient increased water use in the basin is possible through developing storage operating rules. This will also contribute to the regional small-dams strategy, and win an important 'seat at the table' in Zambia which generates 40% of the runoff in the Zambezi.</p>
Strategic		Description
SP 3	Chobe Zambezi Water Transfer Scheme	<p>What: The City of Bulawayo in southern Zimbabwe has experienced periodic water supply problems and several options have been proposed to address this. These include the development of local well-fields and the use of groundwater, pumping from the Zambezi River, and using the existing north-south water carrier in Botswana (which, while promoting transboundary cooperation, will require agreement between the States). CRIDF will initially undertake a cost/benefit analysis to assess the viability of the various options, which will then be taken forward in discussions with stakeholders.</p> <p>Why: This project has strategic value in potentially promoting improved cooperation between Botswana and Zimbabwe.</p>
SP 5	Songwe River Basin Development Programme (SRBDP)	<p>What: The Songwe river forms the border between Tanzania and Malawi in the Malawi/Nyasa basin. The two countries are planning for development of the shared water resources through the SRBDP including hydro and irrigation investments.</p> <p>Why: This project aligns with the multipurpose hydropower development trajectory in the Zambezi. CRIDF involvement allows the Facility to start influencing this process, through the various international legal instruments.</p>
SP 6	Ruya River Flooding	<p>What: The Ruya river forms the border between Mozambique and Malawi in the Shire basin. It is understood that flooding in the Ruya river contributes to flooding in the Shire river which impacts on power generation in Malawi. Catchment management in the Malawian part of the Ruya basin is being investigated, but the flooding problems in the cannot be addressed unless similar investigations are carried out in the Mozambican part of the basin.</p> <p>Why: The project is prioritised by CRIDF because of the transboundary nature of the problem to be addressed and the fact that it can complement studies currently being funded by the World Bank in Malawi. The project can build cooperation around understanding the causes of flooding.</p>

Initial discussions with the Department of Water Affairs in Zambia also suggested the possibility of flow monitoring infrastructure in the Luangwa Valley both to support the existing hydropower at Cahora Bassa, as well as possible future hydropower in the Luangwa.

3.4 The Limpopo

3.4.1 Basin description



The Limpopo River Basin is shared by Botswana, South Africa, Zimbabwe and Mozambique; and has a total catchment area of approximately 408,000 km². Both the catchment characteristics and the social and economic development features of its riparian States are highly diverse. The upper reaches of the basin in South Africa are highly developed, and water quality is affected by mining, industrial and urban return flows. The Botswana and Zimbabwe parts of the basin are more arid, and mostly given over to rangeland farming. However, some 69% of the basin population lies in Botswana, 22% in South Africa and 10% and 7% in Zimbabwe and Mozambique respectively.

The Mozambique part of the basin is dominated by the Limpopo floodplain, which is home to some 1.4 million people. This part of the basin has suffered from frequent and significant flooding. Over the last 45 years the Limpopo Basin alone has experienced 9 major floods. In the 2000 flood;

- 💧 More than 500 people died;
- 💧 More than 2 million were displaced;
- 💧 Mozambique's part of the river swelled from less than 100 metres wide to 10 to 20 km wide for a more than 100 km stretch and inundated more than 1,400 km² of farm land; and
- 💧 More than 20,000 cattle were drowned in Mozambique alone.

The Limpopo Basin is one of the more water stressed of the transboundary basins in SADC, with most of the available water resources fully utilised, although there is some potential for additional infrastructure. Agriculture, mining, and industry account for 75 percent of water use in the Basin, with the majority occurring in South Africa. Irrigation makes up nearly 50 percent of the total demand. Only 20% of farmers are commercial, with the majority small-scale subsistence farmers. This intensive use water has altered the flow regimes, while return flows have impacted on water quality. Together these have impacted on aquatic ecosystems. Large mining projects planned in the coal fields south of the Limpopo River will increase demand for water, demanding trade-offs for other water users and increasing risk to water quality. Water quality is negatively impacted across the Basin, particularly in the Olifants River which supports much of the agricultural and industrial activity. Notably, the Olifants sub-basin is the largest contributor of flow to the entire system due to the heavy rainfall in its catchment area. However, the upper reach of the basin in the Gauteng Province of South Africa also receive return flows ultimately originating from the Orange-Senqu Basin.

Cooperation on the Limpopo Basin dates back to 1986, when the "Limpopo Basin Permanent Technical Committee" was established. This Committee addressed a number of technical issues of mutual concern, ultimately proposing the establishment of a permanent Commission. In 2003 cooperation was furthered through the establishment the Limpopo Watercourse Commission (LIMCOM). LIMCOM has established an interim Secretariat, and is undertaking a number of activities. Importantly, the

Commission is finalising a 'Monograph', which will provide a clearer and common understanding of the state of the basin and the main issues to be addressed in any basin-wide plan.

3.4.2 CRIDF involvement

CRIDF's involvement in the Limpopo Basin will focus on the value of monitoring infrastructure in promoting transboundary cooperation and climate resilience. The basin's heavily developed nature, and the fact that it is prone to flooding, makes both water quality and flow monitoring vital components to climate resilience. Recognising that monitoring infrastructure and processes are often not sustained adequately, CRIDF will aim to develop simple methods based on existing data systems. The Facility will also help stakeholders understand the data to benefits value chain, linking monitoring systems to social and economic benefits.

Engagement with LIMCOM will also place the Facility in a good position to take up projects emerging from the Monograph study. This may include future support to scenario planning and improved operating rules for the existing infrastructure.

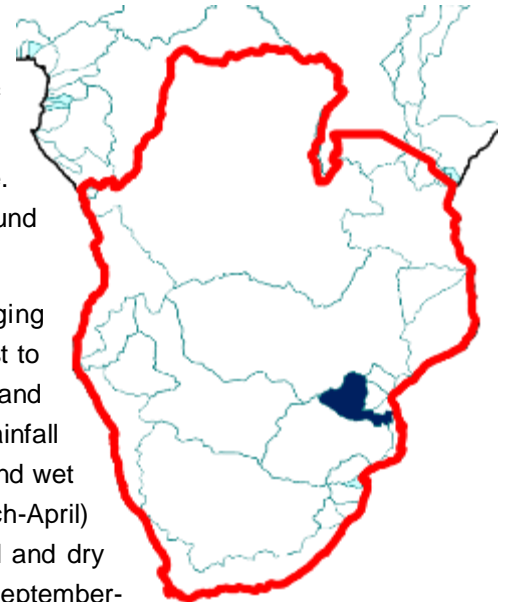
CRIDF is currently engaging the following projects in the Limpopo Basin.

Quick Wins		Description
QW 8	Ntalale Rural Service Centre Rehabilitation	<p>What: The Ntalale RSC's existing infrastructure was badly vandalised, leaving the centre without a functioning water supply scheme. GIZ identified the need to install new well points on a new site, buy new equipment and repair the vandalised infrastructure, but were unable to take the project on.</p> <p>Why: Ntalale lies in a climate 'hotspot' in Zimbabwe, and is expected to experience reduced water availability. The project also provides an opportunity to investigate 'sand river' abstraction to support domestic water supply – which has potential value for similar sites across the basin and elsewhere in SADC.</p>
Focal		Description
FP 4	Small dams Matabeleland	<p>What: The objective of the project is to re-establish dam construction and rehabilitation activities in both northern and southern Matabeleland, through the construction or rehabilitation of a total of 96 dams over a four-year period. It has direct pro-poor benefits, and may hold some transboundary benefit through establishing simple community based mechanisms to monitor inflow and outflow - which could be shared with LIMCOM.</p> <p>Why: This project will be the centre pin in the development of a 'small-dams' strategy, establishing why small dam projects fail, and taking up recommendations in the rehabilitation process.</p>
FP 7	Beit Bridge Border WS	<p>What: Beit Bridge is a key border town - potentially the busiest in the SADC region. The town is facing serious water shortages due to inadequate raw water abstraction and storage capacity, coupled with erratic electricity supply. The City Council regards improvement of water supply and wastewater infrastructure and solid waste services as a critical priority to ensure that the cholera outbreak that occurred in 2008/9 is not repeated.</p> <p>Why: This project provides a good example of addressing basic needs as the foundation for building peace dividends. The transboundary aspects of this border town with the possible cross border transmission of Cholera also provides a useful lesson to be shared.</p>
FP 13	Limpopo Water Monitoring	<p>What: This project was initially proposed as an improved water quality monitoring initiative between Botswana and South Africa, but was expanded to incorporate basin-wide monitoring under LIMCOM. This work can hold considerable transboundary benefits through flow data sharing. Initial work will focus on finding a gap in the existing support where appropriate technology interventions can lead to sustainable monitoring programmes for water quantity, quality and improved flood warning.</p>

		<p>Why: This project is central to CRIDF’s relationship with LIMCOM, and hence for further work in the basin. It is also central to demonstrating that simpler interventions could be more sustainable. The project is also important to CRIDF’s relationship with other donors through the initial work to identify a suitable gap for the Facility.</p>
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3.5 The Save Basin

The Save River Basin (SRB) is shared by Mozambique and Zimbabwe. The river basin has an area of approximately 102,000 km², of which 83% lies in Zimbabwe and 17% in Mozambique. As of 2010, the SRB had an estimated total population of 3.17 million inhabitants, of which less than 5% reside in the basin in Mozambique. The majority are located in Zimbabwe’s rural areas, with the rest found in a few service centres and larger towns within the basin.



The Basin (SRB) encompasses a wide range of climatic types ranging from mountainous with generally higher precipitation in the northeast to drier zones along a north-south gradient, and somewhat more humid and tropical approaching the coast and the Indian Ocean in the east. Rainfall is distinctly seasonal. In general, precipitation occurs during a hot and wet summer season of varying length (November-December to March-April) depending on specific location within the Basin, followed by a cool and dry period (May-August), and subsequently, a hot and dry period (September-November). The Triangle - Chiredzi area is a notable exception with the heaviest rainfall occurring in March instead of December.

Total surface water resources in the SRB are estimated at 6,885 million m³/year (based on the period of record from 1960 to 96). The upper sub-basins of the Save River are the wettest, contributing to 52% of the total surface water generated, followed by the Runde catchment at 32%, with the sub-basins in Mozambique contributing 15%. On average this corresponds closely to the area distribution of basin area between Zimbabwe and Mozambique of 83% and 17% respectively.

The supply-demand scenarios for the Save catchment show that the total estimated water demand in 2010 was approximately 33% of the MAR in the upper sub-basins with the demand projected to increase to about 49% of MAR by 2030. For the Runde sub-basin, the 2010 water demand was 68% of the MAR, increasing to 147% by 2030. Only 19% of the growth in water demand between 2010 and 2030 in the upper sub-basins of the Save can be supplied with the existing water infrastructure. In the Runde sub-basin, only 25% of the growth in water demand between 2010 and 2030 can be supplied with the existing water infrastructure. Additional water infrastructure and improved dam operating rules, are required in future to improve the water supply to users in the entire Save Basin. In the Mozambique part of the Basin, water utilisation is still relatively low. Plans are in hand, however, to install large irrigation schemes to boost food production.

Climate variability and climate change are causing more extreme and frequent water related hazards. The Save Basin, especially in the lower reaches, is prone to flooding. This often results in disastrous consequences with the loss of lives, property, damage to infrastructure and the environment. Indications are that the frequency of flood disasters has been increasing. Droughts are also being experienced in the basin and this has a huge impact on water supply and food security. .

The pollution of the Save water resources from the discharge of raw sewage and mining effluent is problematic, especially in Zimbabwe. There is the potential for high level pollution from mines that could endanger lives. In particular there is a risk of acid rock drainage and cyanide spills from gold mines and artisanal mining activities prevalent across the basin.

The JIWRM Strategy for the SRB, identified five strategic action areas, specifically:

- Institutional Framework for Water Resources Management and Development: Strengthening cooperation in the management and development of the Save River Basin.
- Water Resources Infrastructure Development: To meet the needs of current water demand and projected water demand.
- Enhanced Water Resources Knowledge and Information Systems: Ensuring availability of information for the planning, management and development of water resources.
- Water Resources Management: Promoting an integrated approach to managing water resources in the SRB and ensuring capacity to manage and respond to water related hazards.
- Environmental Sustainability: Ensuring present and future environmental integrity.

CRIDF will be providing support to all of these components through the following Projects.

The following Projects from the Save River Basin are currently in CRIDF's Projects Pipeline.

Quick Wins		Description
QW 2	Bindangombe Climate Resilience	What: To utilize water from an existing small dam to irrigate land downstream of the dam. The Project will also provide WASH facilities to nearby villages and a business centre. Why: The Project is situated in a climate 'hotspot' in Zimbabwe where rainfall is very low (MAR <450mm) and erratic for the reliable production of even drought resistant grain crops. The Project will demonstrate the potential of small dams to contribute to climate resilience.
QW6	Kufandada River Protection	What: Support for irrigation, water supply and river protection. Ensuring sustainability of source and water use efficiency together with optimal use of stored water. Why: Improving water security and optimal use of stored water to contribute to climate resilience
Focal		Description
FP	Dam Operating Rules	What: To develop Dam Operating rules for the Save River Basin Why: Needed to optimize water utilization in the Basin in order to ensure equitable use of basin resources between the two countries

3.6 The Buzi and Pungwe Basins

The Buzi River Basin

The Buzi River Basin is shared between Mozambique and Zimbabwe. The total catchment area is approximately 28,900 km² of which about 13% of the basin is in Zimbabwean territory while the Mozambican territory covers the remaining 87%.

Altitudes range from peaks of up to 2,500 meters in the mountains down to sea level. The eastern parts of the basin are flat plains with low altitude and these areas are prone to flooding during the monsoon season.

The Buzi River Basin stretches over two climate types; a humid mountainous climate in the west and a tropical humid climate at the coast in the east. In the west the humid mountainous climate prevails due to the mountain range that forms the border between Mozambique and Zimbabwe. In this region the mean annual rainfall can reach above 1,500 mm/year.

The two major tributaries of the Buzi River are the Lucite River and Revue River. They flow from the mountainous areas in the western part of the basin in Zimbabwe towards Mozambique in the east.

The estimated surface water resources in the Buzi River Basin is approximately 5,700 million m³ per year at the river mouth. Most areal runoff is generated in the mountainous sub basins and declines going downstream. Most water is generated in the Upper Lucite (20%), Upper Buzi (16%) and Lower Revue (12%).

With regards to the groundwater resources in the Buzi River Basin, an estimate based on an analysis of aquifer types and recharge conditions in the basin has concluded that 50% of the basin has a 'moderate' to 'high' groundwater potential and 50% of the basin has a 'very low' groundwater potential. The '*high potential*' aquifers occur in association with the 'karst' and 'unconsolidated intergranular' aquifers, within the central and "southern side" of the Buzi River Basin. They also extend to the coast. The '*moderate potential*' aquifers occur in association with the fissured aquifers in the central and upland portion of the Buzi River Basin.

Floods and cyclones are frequent in the lower parts of the basin and recent extensive flooding occurred in 2000, 2007, 2008 and 2010. The combination of high flood magnitudes and flat plains with low altitude and highly populated centres makes flooding one of the major water resources management challenges in the Buzi River Basin. Flood prone areas are: Chibabava Town, Buzi town and district (the estuary); the areas of Estaquina and Goonda near the confluence of the Buzi and Revue Rivers; and Sussundenga district.

The Buzi River Basin is not severely exposed to droughts; recent rainy seasons have been more characterized by flooding. However during drought, low flow at the border can be reduced to less than 2 Mm³/month. This has occurred for example in 1973 and more recently during the drought years 1991-92.

In general the water quality in the Buzi River Basin is within acceptable range and the ecological status ranging from class C (moderately modified ecosystem with a loss and change in the natural habitats) and higher (detailed explanation is given in the Monograph Report). However, there are a number of areas of concern and there are threats in the Buzi River Basin to the future water quality and environmental integrity

For the JIWRM Strategy of the Buzi River Basin, four strategic action areas were identified, specifically:

- Meeting water demand and assurance of water supply to key water using sectors.
- Ensuring water quality and sustaining aquatic ecosystem health.
- Reducing water related vulnerability.
- Enhancing capacity to fulfil international and national obligations in order to ensure sustainable use and development.

The following Projects from the Buzi River Basin are currently in CRIDF's Projects Pipeline.

Quick Wins		Description
QW3	Chibabava WS and Flood Protection	<p>What: To rehabilitate and upgrade WSS to meet the growing water demand from population pressures and to replace ageing equipment. Additional works include provision of sanitation facilities to the community and environmental protection works. Water Demand Management, Health and Hygiene awareness raising/training will be provided.</p> <p>Why: Project is within the Buzi Catchment which is shared between Mozambique and Zimbabwe. Infrastructure vulnerable to flooding and water source exposed to pollution. The Project will benefit the 14 000 people who live in Chibabava and about 1000 visitors per month.</p>
FP?	Buzi Multipurpose Project	<p>What: Lucite Dam has a multi-purpose potential. The direct benefits of the Lucite Dam project include hydropower, irrigation and flood control.</p> <p>Why: Mozambique has the least per capita water storage and buffer capacity to deal with extreme natural events. Project is key for the planned irrigation developments and flood control in the Buzi Basin.</p>

The Pungwe River Basin



The Pungwe River is shared between Mozambique and Zimbabwe. The Governments of the two countries recognise the need for efficient joint management and coordinated development planning of the water resources in the Pungwe River basin, to overcome current and future problems of supplying water of adequate quantity and quality to all users and to secure a dependable flow in the Pungwe River basin. Mozambique and Zimbabwe established the Joint Water Commission in Harare in December 2002. The objective of the Commission is to act as technical adviser to both countries on matters relating to the conservation, development and utilisation of the shared water resources and to perform such other functions pertaining to the conservation, development and utilisation of the shared resources.

The Pungwe River rises from the Eastern Highlands in Zimbabwe and flows eastwards through the Mozambican provinces of Manica and Sofala on its way to the Indian Ocean at Beira. The river is 400 kilometres long and drains a total catchment area of some 31 151 km² of which 1 461 km² (4.7%) is within Zimbabwean territory and 29 690 km² (95.3%) is within Mozambique. The main tributaries of the Pungwe River from the source to the mouth are the Honde, Nhazonia, Txatora, Vunduzi, Nhandungue, Urema and Muda rivers.

The River basin stretches over two climate types. The western part has a humid mountainous climate where the mean annual rainfall may be above 2 000 mm, and the temperature is significantly lower than in the surrounding, non-mountainous areas.

In the eastern region, near Beira, the climate is classified as tropical humid, with a temperature variation from 22 °C in July to 29 °C in January. Here, the average rainfall varies from 300 mm in February to 20 mm in September. Rainfall is distinctly seasonal with a pronounced concentration during the warm season November-April. Normally very little precipitation falls from June to October.

In large, the Pungwe is a perennial river with a low degree of development as concerns abstractions, diversions and regulation. The large temporal variation in precipitation in the region leads, however, to great annual variations in the Pungwe flows. Both flood and drought periods are experienced. Since major dams are lacking, the negative impacts of these events are difficult to control and mitigate.

The spatial distribution of rainfall over the Pungwe River basin gives also distinct differences in the availability of the water resources. Although, only covering some 5% of the area the Zimbabwean part is estimated to produce between 25-30% of the natural runoff. The reason for this is that the change in generated runoff is very rapid when moving from the western Mozambican parts up to the mountainous areas in Zimbabwe.

The lower part of the basin located in Mozambique is particularly vulnerable to floods, droughts and other disasters, like accidental pollution incidents or the risk of dam breaches.

One environmental problem that exists on both sides of the border in the Pungwe River Basin is artisanal gold panning/mining which impacts negatively on the quality of the water resources.

Economic activities in the Pungwe Basin are largely based on agricultural production, small-scale and commercial livestock production, wildlife and forestry resources utilisation, and fishing. Agriculture is dominated by subsistence dry land farming and irrigated cash crop production. With the exception of the large-scale commercial tea and forestry plantations in Zimbabwe, and Mafambisse Sugar Estate in the Pungwe Estuary in Mozambique, the majority of the basin population relies on subsistence agriculture for its livelihood.

The abundant water supplies in the basin, good soils and rich ecosystems that depend on water provide a good basis for social and economic development, provided wise water management is practised.

Mozambique and Zimbabwe established the Joint Water Commission in Harare in December 2002. In terms of Article 1(2), the objective of the Commission is to

The JIWRM Strategy of the Pungwe River Basin identified four strategic action areas:

- Use the water resources of the Pungwe River Basin in an optimal and efficient way to improve the socio-economic conditions for its stakeholders giving due consideration to equity, fairness, and environmental values;
- Increase the participation of stakeholders in the decision-making of water management and development in order to raise the ownership and acceptance of the chosen alternatives;
- Build sufficient institutional capacity within the water authorities and stakeholder fora to enable a sustainable and adaptive integrated water resources management process in the Pungwe River Basin;

- Establish the necessary legal agreements between the two countries for the sharing of the Pungwe River Basin in order to enable joint water management and exchange of information and data.

Generally the basin is not water stressed, lies almost entirely in Mozambique, and there are limited opportunities for projects realising substantial transboundary benefits. CRIDF's current focus in the Pungwe Basin is on WSS provision. This recognises that this area is one of the poorest regions of SADC and is significantly underserved in this respect.

The following Projects from the Pungwe River Basin are currently in CRIDF's Projects Pipeline.

Quick Wins		Description
Focal		Description
FP 10	Gorongosa Dam	What: Water supply system for Gorongosa village. The GoM has mobilized resources for the construction of Gorongosa Dam but funds for the Water Supply System for Gorongosa Village have not been mobilized. Why: Improving access to water to meet basic human needs
FP 8	Metuchira Dam	What: Water Supply System for Metuchira Village. The GoM has mobilized resources for the construction of the Metuchira Dam located in the Sofala Province of Mozambique, on the Metuchira River, a tributary of the Pungwe River that Mozambique shares with Zimbabwe. Funds for the Water Supply System for Metuchira Village have not been mobilized. Why: Improving access to water to meet basic human needs.

3.7 The Rovuma and Okavango Basins

Still to be developed

3.8 The InKomati, Umbeluzi and Maputo/Usutu Basins

Still to be developed

3.9 The Kunene and Cuvelai Basins

Still to be developed

4 Thematic approaches

4.1 Background

While the previous two sections have proposed approaches based primarily on water resources challenges; achieving CRIDF's strategic objectives requires cross cutting thematic approaches. These will enable the team to build key CRIDF concepts into its projects (CRIDifying them), as well as making sure that each project makes the best possible contribution to Logframe. It will as allow the Facility to initiate projects which will further build on these concepts, deepening the ties to CRIDF's core mandate and ensuring that the portfolio of projects contributes to the impact statement.

This section outlines these cross-cutting thematic approaches.

4.2 The water, food, carbon and energy nexus approach

The water, food and energy nexus concept has been gaining increasing traction across the world. Water is embedded as virtual water in products, and is required for most forms of energy production. Increasing demands for food and energy associated with increasing affluence results in exponential increases in water demand. Growing water, food and energy demands associated with increasing wealth in drier Countries means that they need to import virtual water in food and energy. Wetter nations are consequently being targeted for land acquisition, to grow food for export. Increasingly power is being distributed over very long distances through shared power pools.

The SADC region poses particular challenges in this regard. Three of the 11 CRIDF focus countries are expected to be in the list of the 10 fastest growing economies in the next 5 years; Mozambique, Tanzania and Zambia. Angola was the world's fastest growing economy over the last decade. Much of this growth will be associated with energy; oil and gas finds in the coastal waters. Water demands in these countries, and the region as a whole, can be expected to grow significantly in response. However, SADC is also one of the largest target regions for foreign land acquisition for agricultural production, often associated with the direct export of the food produced to the country buying the land. The export of virtual water in food from SADC to China, India and other rapidly developing regions is a growing phenomenon.

However, these challenges also provide significant opportunities for regional peace dividends and hence CRIDF involvement. Not only does virtual water trading provide ready markets for agricultural products in developing drier regions; which is vital for sustainable irrigation projects, but trading food and energy within the region can further strengthen regional ties; even beyond the shared basins. This deeper regional integration across several sectors is likely to be the key to sustainable peace dividends. While South Africa has indicated its strategic interest in the Zambezi as a source of water once the Lesotho Highlands have been fully exploited, longer term peace dividends and environmental and climate considerations may suggest that food and energy are imported rather than blue water.



The widely varying water availability across SADC therefore provides an opportunity for CRIDF. The southern basins face physical water stress; but support the region's strongest economies and the highest water and energy demands. The northern basins are typically well watered; but water use and food production does not support their economies to the extent it does in the south. However, the northern basins are also home to the region's fastest growing economies and large scale foreign land purchases. In the longer-term SADC is unlikely to be able to achieve its vision for greater regional economic integration, sustain its GDP growth; while still maintaining entirely sovereign water, food and energy security in all its Member States.

Securing lasting peace dividends only through cooperation on transboundary waters may therefore become increasingly difficult, and a regional approach based on the water, food and energy nexus can may be required to secure lasting peace dividends. Increasing the hydropower potential in the north and sharing this through the SAPP, growing food in climate resilient irrigation projects and selling this within SADC transfers virtual water around the region, and contributes to regional integration. Moving away from coal-fired energy and irrigation expansion in the south, freeing up water and reducing carbon footprints holds significant regional benefits.

Together these offer a compelling strategic vision for peace dividends, but enormous difficulties in execution. World-wide this kind of nexus dialogue is largely driven by the water sector. Bringing in the energy, agricultural and financial / developmental stakeholders may hold the key to traction around this important concept. Perhaps more importantly, Countries are very hesitant to give up sovereign security for regional peace dividends, especially in the light of recent and ongoing instability in some parts of SADC. Navigating this nexus will be particularly difficult.

Energy production in SADC is characterised by two inter-linked power networks, a northern hydropower dominated network, and a southern thermal dominated network. However, because the larger economies of the southern countries exert the greatest power demands, SADC as a whole derives up to 75% of its energy needs from thermal power stations. A heavy reliance on coal fired energy makes the region one of the world's highest per capita carbon producers relative to its GDP. The availability of energy is expected to be a significant driver of regional economic growth, and all the SADC States are activity pursuing increased energy production. The Southern African Power Pool (SAPP) has created the opportunity to share this energy across the region.

CRIDF is well placed to make a seminal contribution in this regard, and must do this through influencing the planning processes. This will require winning a 'seat at the right tables', and establishing itself as a 'trusted advisor' through its projects. The Facility will therefore look to expanding purely irrigation projects to include hydropower and improved access to markets (potentially for export) - as is the case for the Ruhuhu Project; and will show that a strategic regional water, food and energy security perspective may yield different answers to a purely water security perspective – as is the case with the Vaal-Gamagara Project. Projects in the well watered basins will look to expanding food production – potentially for export through the SADC transport corridors.

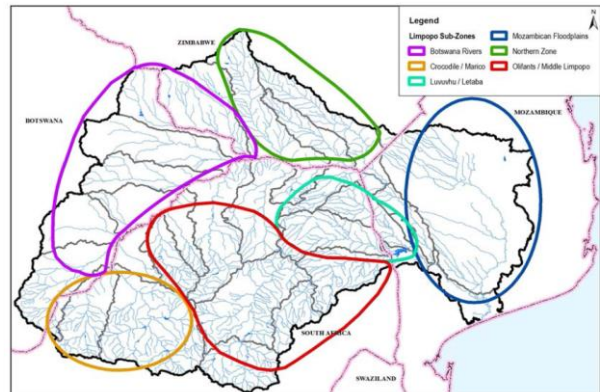
CRIDF will therefore support assignments aimed at better understanding existing and potential virtual water flows in food and energy around, into and out of the SADC region. This will help develop the tools to introduce the concept to the right people, at the right levels, and at the right time (once the Facility is seen as a trusted advisor).

4.3 The Climate Resilience approach

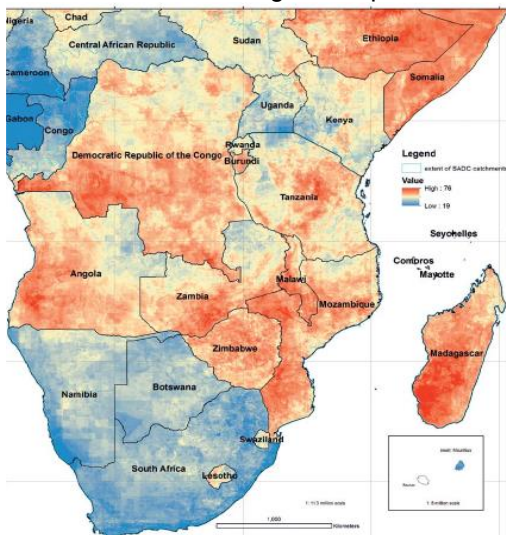
Climate resilience lies at the heart of CRIDF’s *raison d’être* and must be built into all the Facility’s operations. This section outlines how CRIDF will inculcate climate resilience into its projects using climate vulnerability mapping to understand what makes communities in our project areas vulnerable, and as the Facility establishes itself in the region – to increasingly select projects from the most vulnerable areas of the SADC region.

Studies downscaling Global Climate Models (GCMs) in SADC tend to indicate that the wetter areas will get wetter, and the drier areas drier; and that variability in runoff will increase. Generally, the probability of floods and droughts across the region is expected to increase. The ubiquity of the climate change dialogue also means that most basin studies have included climate change assessments, although the way this is taken up in the basin planning tends to differ. Some of these studies, like in the Orange-Senqu System have focussed on assessing the likely exposure to climate change i.e. possible changes in rainfall and temperatures; whereas others like in the Limpopo basin have expanded this to vulnerability mapping i.e. the ability of the communities and economy to cope with these impacts. However, few basin plans include specific responses to climate change, and most rely on managing climate variability.

Regional climate change studies have either mapped expected changes in temperature and rainfall; downscaled these to changes in runoff; or have mapped climate vulnerability based on a range of factors, including the exposure of the communities as well as the ability of SADC Governments and economies to cope with potential changes in climate.



The Limpopo Monograph Study climate vulnerability map.



OneWorld’s Climate Vulnerability Map for 2050

CRIDF will use all these materials in formulating its approaches to building climate resilience, and has adopted the following working definition to building climate resilience; “*Any action or project at regional, national, sub-national, or local (community level) that better enables people, particularly the poor, to predict, manage, or mitigate the impacts of extreme climate events through infrastructure interventions*”.

The capacity to take these actions will differ across the region, and the Facility must account for these regional differences in its strategy for building climate resilience. South Africa has for many years based its water resources management and reservoir operating rules on stochastics and the probabilities of not meeting given assurances of supply. This approach inherently accommodates climate change and is appropriate where there is inter-annual storage and where the economy is less rainfall dependent. This approach is useful in the Limpopo, Inkomati and Orange-Senqu Basins,

and CRIDF is expanding this thinking to the Save Basin with similar storage and water stress characteristics.

However, this approach may not be as relevant for Basins with less storage relative to runoff, which are less water stressed, where the economy is more rainfall dependent, and in countries with lower adaptive capacity (the governance procedures required). In these areas, developing small-scale storage and operating rules (improved governance) to manage intra-annual variability, diversifying livelihoods, and providing drought and flood warnings will be key strategies to building climate resilience.

The retro-fitting (or climate proofing) of infrastructure to cope with increased floods or longer droughts; and better enabling able communities to cope drought with or seek refuge from, floods will be relevant for most of the region, but CRIDF's initial focus would be to build this into its approaches flood warnings.

This approach to building climate resilience has to be set against the need for a demand driven approach to identifying projects, and the shorter term need to establish CRIDF in the region. CRIDF recognises that the timeframes for climate change impacts are typically several decades, and that demographic changes will have much more immediate and significant impacts on water availability. Demands for projects in the immediate term will mostly focus on addressing the immediate needs of the poor, and simulating growth. At least in the first 2-3 years of CRIDF's lifetime most projects will not be identified because they lie in the most climate vulnerable areas. An exception is the Zambia CCAP project which responds to a request to support this project focussed on the most climate vulnerable areas of Zambia.

In this period the Facility will consequently identify, from relevant climate vulnerability maps, the key components of climate vulnerability in the beneficiary communities; and will specifically address these components in the delivery of the Project. In the longer term, and once the Facility is established as a trusted advisor, the team will increasingly work with the relevant government agencies to focus on the more climate vulnerable areas. These concepts will be further elaborated in a specific climate resilience strategy.

4.4 The Small-dams approach

The delivery or rehabilitation of small scale storage facilities will form an important part of CRIDF's strategy towards building climate resilience in poor rural communities. Small dams provide intra-annual storage allowing beneficiary communities to better cope with shortened wet seasons, and improving food security by providing water for dry season crops. In some cases greater assurance of water supply may allow for excess crop production – providing a source of income for these communities.

However, many small dam developments across the region have failed; dams rapidly silt up reducing storage, dams fail in floods, or do not provide for environmental flows impacting downstream communities. CRIDF will therefore address the sustainability of its small storage infrastructure projects by addressing;

- Appropriate design of the infrastructure to ensure that it;
 - ❖ Is capable of coping with floods that may be expected under climate change through spillway design of routing of floods around the dam;
 - ❖ Allows for the flushing of accumulated sediment, or where sediment can be trapped in pre-impoundment structures;
 - ❖ Is sized according to the expected runoff under climate change scenarios;
 - ❖ Can provide for environmental flows;

- Investigating mechanisms to manage the natural infrastructure of the storage catchment area to protect or establish wetland areas and riparian protection zones through;
 - ❖ Micro-financing or payments for ecological services;
 - ❖ Working with catchment management agencies and upstream water user associations;
 - ❖ Including wetland rehabilitation upstream of the structure in the infrastructure delivery;
- Improving the operation of the dams by linking abstraction rules and irrigation practices to hydro-meteorological information;
- Using the dam sites as flow monitoring systems to improve basin wide water resource modelling; and
- Establishing local community governance mechanisms to support dam operations and water apportionment.

Collectively these small storage projects will be used to contribute evolving regional approaches to effective and sustainable small-scale projects, sharing these experiences between the projects.

4.5 The Stakeholder approach

Ultimately, CRIDF aims to contribute to regional peace through establishing mechanisms, approaches and the associated infrastructure that will sustain cooperation even under the pressures of climate change. Rapid demographic change will place stress on shared water resources in the shorter term; and ultimately sustainable peace dividends are likely to lie in regional water, food and energy security rather than sovereign water security. However, this is a long-term goal, and in the face of urgent national priorities to address poverty and promote national water, food and security this will be a “hard sell”.

In order to sell this concept; and in the absence of Country-to-Country agreements which provide a basis for introducing these concepts; CRIDF must gain the confidence of national stakeholders. The core of the Facility’s stakeholder strategy is therefore to establish itself as a ‘trusted partner or advisor’ throughout the region. The Facility’s approach to engaging its stakeholders will therefore be to initially gain their confidence by working with them to identify their immediate needs, and to be seen to deliver on these demands through infrastructure. SADC must play an important role in this process, and the Water Division will be engaged to align the Facility to SADC priorities. SADC’s long standing role as a facilitator and enabler of projects, and transboundary arrangements is also vital to opening doors and CRIDF must piggyback on the Community’s established role in this regard.

However, SADC is not empowered to commit its Member States to any project or programmes *per se* and the Facility will have to build its own relationships with national role players, and also establish itself as a trusted advisor in the national context. This means that the Facility may have to take on some projects, which address key national needs, but which do not necessary provide immediately obvious transboundary or strategic benefits. It also recommends that CRIDF should fund some small-scale infrastructure from its own resources in its first 2 to 3 years of operation, thus guaranteeing delivery in the Facility’s lifetime. This can also be used to incentivise progress and bring the stakeholders on board for some projects, ensuring that they reach the infrastructure delivery stage within a reasonable timeframe.

CRIDF may establish more formal arrangements with some countries through specific agreements to work on some projects, or Memoranda of Understanding on which both the Facility and the 'host' Countries can justify the allocation of resources.

Similarly, River Basin Organisations (RBOs) have already established intuitional mechanisms for cooperation on shared watercourses. These bodies will be key cooperating partners for CRIDF, and the Facility will engage them to identify projects that are seen as basin priorities, or to contribute to their basin planning processes. This may be supplemented by providing embedded technical support to help drive CRIDF projects in that basin.

Other regional bodies like the GWP and IUCN will also be important stakeholders, and may be engaged through the delivery of some projects and in promoting the Facility to their partners.

4.6 Other thematic approaches

As CRIDF progresses it may become necessary to develop additional approaches to key or common issues across several projects. This may include approaches to building water demand management into domestic water supply projects to larger towns and cities, approaches to address WSS and WASH needs in rural community projects, improve and diversify the livelihoods of the poor and the sustainability of these interventions, approaches to address gender, and so on.

These approaches will be built into CRIDF as and when needed, and if necessary retrofitted to ongoing projects.

4.7 Summary

This section has outlined CRIDF's approach to several cross-cutting themes that are central to the Facility's mandate and to achieving the impact outlined in the Logframe. However few projects will, on first presentation to CRIDF, reflect all of these themes and approaches. The Facility will therefore CRIDify projects put forward through regional or basin plans, or by stakeholders, expanding them to address as many of the thematic approaches as is viable, thus making sure that each project makes the greatest possible contribution to the Logframe.

In the longer term CRIDF will start actively seeking projects that address some of the thematic areas that are under served, thus making sure that the overall portfolio of projects makes the greatest possible contribution to the impact statement.

5. CRIDF resource use

5.1 Background

While CRIDF has a four year lifetime, a substantial portion of its current budget of some £ 18.2 million has to be spent in its first two years – with an anticipation of re-financing for the last two years. This amounts to an average (accepting that spend of the first 6 months is limited) of close to £ 1 million per month. To date the Facility has allocated some £200,000 per month to a range of projects and its PMU, and a scaled up resource use strategy is essential to ensuring the full budget allocation is used effectively. This has two components; firstly a plan to scale up the number of projects or assignments in the CRIDF pipeline, and secondly a plan to increase the spending on priority projects through delivering infrastructure from CRIDF resources. These components in turn have to be guided by value-for-money (VfM) principles.

The former has been largely achieved through a concerted effort to introduce a number of new projects into the pipeline. In the latter case, the Facility will have to balance a focus on increased Technical Assistance on a wider range of projects, with delivery of small scale infrastructure on key projects, with the need to exercise due diligence in the design and supervision of infrastructure before it is funded. This must also recognise the benefits mobilising stakeholders using commitments to deliver infrastructure from CRIDF sources, provided they progress to implementation stages in time.

This section outlines the approach to finding this balance.

5.2 Scaling up the pipeline

CRIDF has already taken steps to scale up the number of projects in its pipeline, delivering on some 45 new Terms of Reference over the last month, covering activities on projects as well as assignments in support of delivering on projects. These activities and assignments stem from; interactions with stakeholders that have identified new opportunities for support; through ‘organic growth’ from the inception phase activities; and from the growing need to deliver on specific assignments which provide the information needed to support the thematic strategies.

The Facility now has some 62 Projects and Assignments in its pipeline. These largely cover the geographical area of CRIDF actions, both with respect to the target basins and the SADC mainland States. They cover range of approaches outlined in the previous section, and every thematic area has at least one assignment or project that will help inculcate the concept in the Facility and region. Many of these existing projects will generate multiple Activities as they progress towards implementation, while some may spawn additional and related projects. The Facility will deliver on its Outcomes, and will make a notable contribution to its Impact with the current pipeline of projects and enabling assignments.

Some of the existing projects may be delayed through a range of factors beyond the control of the Facility, others may need to be stopped, while some may progress to the point where they require little ongoing intervention from the PMU. The CRIDF management team will therefore constantly monitor the pipeline against all the thematic approaches, basins and countries ensuring that the Facility will achieve its aims through action to deliver on all the Logframe Outputs; and identifying the need for additional projects or assignments in a timely manner.

5.3 Balancing internal and external capex

It is unlikely that CRIDF would be able to utilise its full budget through just technical support; seeking external financing for capital investments on all infrastructure. It is equally true that CRIDF will not be able to deliver some of the larger infrastructure from internal sources, and the Facility model is founded on facilitating access to finance for a larger number of projects. Moreover, CRIDF recognises that in many cases delivering on water infrastructure for the poor, because it is both a social and economic good status and the developing low income status of many of the CRIDF focus countries, is sometimes very difficult to finance. In addition, the delivery of small scale infrastructure using capital from the Facility's own resources provides the opportunity to incentivise progress on key projects.

CRIDF will therefore balance delivering on infrastructure from its own capital resources for key small scale infrastructure, with the mobilisation of external capital for larger scale infrastructure.

To do this the team will consider the following;

- The size of the infrastructure. Some infrastructure planned for CRIDF projects may require significant capital investment. The Facility would not be able to provide the capital for large infrastructure without compromising the need for effective Technical Assistance and due diligence;
- The time it will take to construct. Some projects may be several years just in the construction phase. CRIDF would not be able to use internal resources to finance infrastructure that will only be delivered far beyond its timeframe. (This assumes that the Facility may be able to commit some of its internal resources a year or so beyond its lifetime);
- The need to be seen to deliver on key small scale infrastructure, and / or the need to catalyse stakeholders by 'guaranteeing' delivery within the CRIDF timeframe;
- The need to exercise appropriate due diligence in the design of the infrastructure and to ensure that it is sustainable. Some infrastructure will require some time to ensure that it is climate proof and complies with all engineering standards before design can be completed. Some projects will therefore not be ready to move to implementation inside the CRIDF timeframe;
- The possibility of phasing the work and delivering on parts of the infrastructure in the shorter term, which may catalyse external financing; and
- The ease at which external capital financing could be found. Some projects, while critical to CRIDF's impact statement may be more focussed on water as a social good (rather than an economic good). This may make it difficult to finance from some sources.

5.4 Project spending plans

The Facility will have to consistently keep track of its actual spending against projected spend in order to effectively utilise its resources and balance its internal and external capital expenditure (Capex). Decisions to shift in either direction would have to be made in a timely manner, to provide time for the Facility to adequately respond; shifting significant additional resources to capital expenditure in the final year of the project may not allow for sufficient time to actually construct the infrastructure.

The Project Manager for each project will therefore to develop a project implementation plan, at the end of the 'eligibility' stage. This will include a decision on whether all or parts of the planned infrastructure could be delivered internally after in view of the above considerations; the expected capital costs of the infrastructure; and a quarterly spend projection for both internal capital and technical assistance

expenditure and external financing on this basis. The other components of the project implementation plan are outlined in section 7.

In this respect it is expected that the overall spending rate will increase throughout the lifetime of the project. Initially, the greater proportion of CRIDF spend will be on Technical Assistance to take projects through the screening process, prepare thematic approaches, and mobilise stakeholders. As the Facility enters its second year of implementation (and given the need to spend £ 18.2 million in the first 2 years) spend on small scale infrastructure will need to increase. This means that some projects were the Facility will be in a position to use internal capex will have to be prioritised over the next six months – ensuring that they reach financial closure in the next 6-8 months. These will predominantly come from the Quick Wins Projects, although it is anticipated that some of the Focal Projects may be able to deliver on some infrastructure components in the shorter term.

As it is likely that the best laid plans will go awry, it will be critical to consistently keep track of actual versus planned spend for the whole Facility. Initially the sum of the quarterly spend projections for all the priority projects and assignments would provide planned TA and capital expenditure. Setting this against available budgets and interim spend targets will inform the initial selection of priority projects. Keeping a running estimate of the actual spend against projections will help the CRIDF team respond in a timely fashion. Potential changes to the CRIDF timeframe and budgets necessitates a rolling approach to the processes of project prioritisation and identification.

In any event, the Facility may only be able to take on a limited number of projects in the final 18 months of its lifetime to provide sufficient time to take them through at least the bankability stage, providing the stakeholders with a sufficient basis to continue the process with their own resources.

5.5 Sourcing external capex

Long-term peace dividends and closer transboundary cooperation will primarily come from larger projects. CRIDF must therefore find considerable external financing for its projects in order to make a substantial contribution to its impact statement. The limited timeframe of the Facility – recognising that these larger projects could take 2 to 3 years to reach the bankability stage – means that potential financing opportunities would have to be identified as early as possible.

This will be done through the Project Implementation Plan (PIP). At this stage, and after consideration of the elements outlined in section 5.3, a decision will be made on what parts of the infrastructure could viably be supported internally, and what would have to be sourced externally. The Financing Strategy will identify the potential sources of finance based on the nature of the project, as well as the activities / tasks would have to be done during the preparation of the project to ensure that the key concerns or focusses of the potential financiers are adequately addressed. This will also allow the finance team to start engaging potential financiers early in the project development, to make them party to its rollout.

6. The Logframe

6.1 Background

In spite of its trendy title, this 'From Projects to Peace Strategy' is simply the process CRIDF will follow to deliver on the Logframe. The sections outlined above present approaches for the implementation of the Facility; driven initially by the regional context and SADC water challenges; through projects that are geographically relevant (across basins and Member States), which are tailored to the water resources characteristics of the 'host' basins, and which address key thematic approaches necessary for the Facility to respond to its mandate. However, the selection, management, implementation and prioritisation projects must be influenced by the need to spend the available resources within given spending targets, and the overarching need to ensure VfM.

All of this needs to respond to the Logframe in order to justify the use of CRIDF resources. This section outlines CRIDF's approach to these challenges.

6.2 From Context to Projects to Logframe

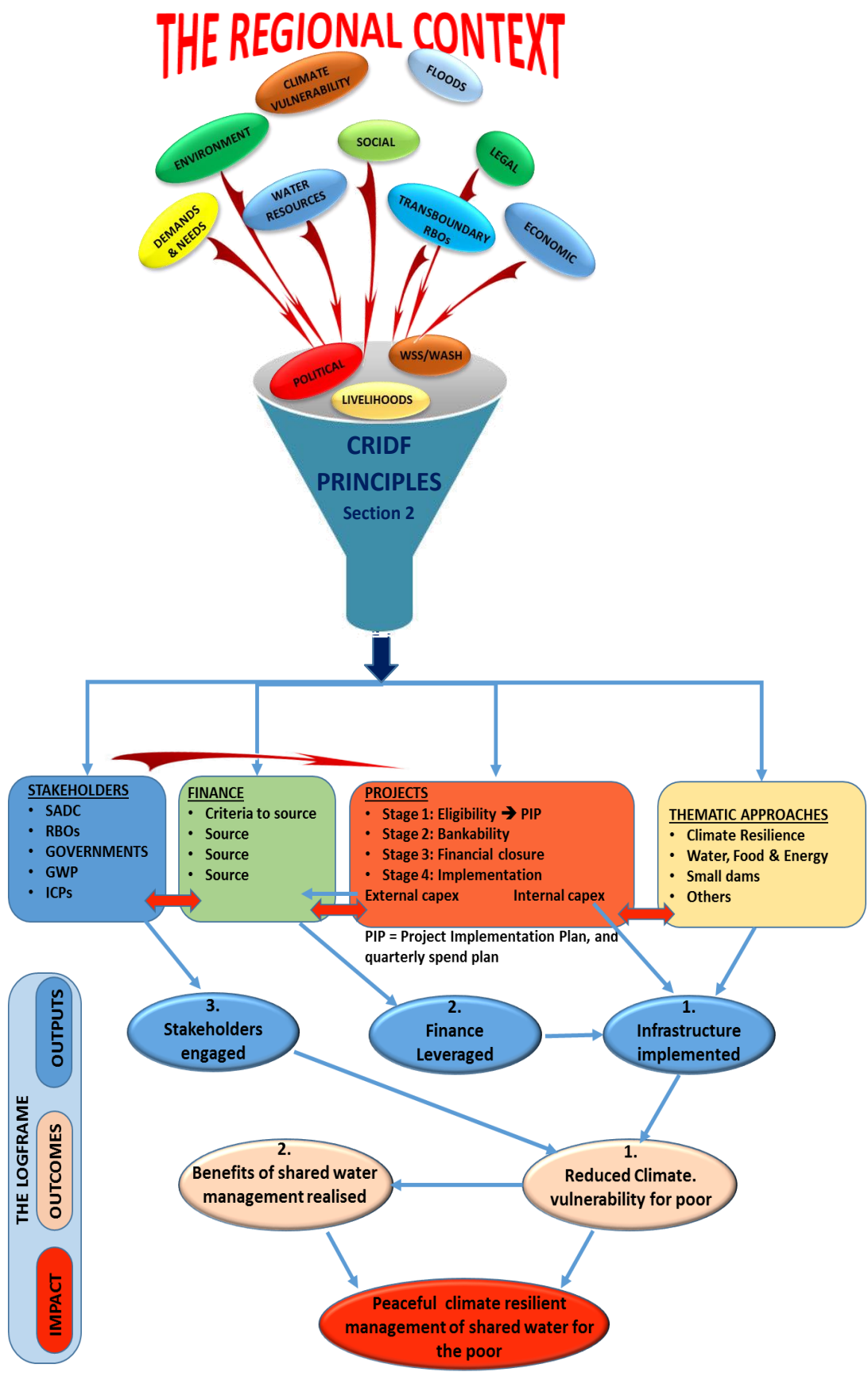
Ultimately CRIDF must respond to SADC's regional context, challenges and transboundary water ethos. To do this the Facility must respond to its core business or mandate; to deliver small and medium scale infrastructure which benefits the poor, building their resilience to the impacts of climate change, and promoting transboundary cooperation. Projects that do this will lie at the heart of the CRIDF business model, and will as the Facility moves further into its implementation phase, consume an increasing proportion of the overall effort.

Beyond this CRIDF recognises that long term peace dividends lie in introducing key concepts into the regional context, but in a politically savvy manner.

The Logframe responds to these issues, tying the threads together and establishing the framework against which CRIDF will deliver all its activities, projects, enabling assignments; and against which the Facility will monitor and evaluate progress – responding in a timely manner to changing circumstances and emerging challenges. The relationship between these elements is outlined in the diagram on the following page.

Output 3 will ensure that the stakeholders are engaged such that the Facility will deliver on the needs of the host Countries, and that key strategic concepts necessary for a sustainable impact can be introduced. Output 2 will ensure that infrastructure can be financed, while Output 1 ensures the actual delivery (perhaps outside the timeframe of the Facility) of the infrastructure. The resultant Outcomes of reduced climate vulnerability and the benefits of shared management of transboundary watercourses, will together deliver on the impact.

FROM SADC CONTEXT TO PROJECTS TO PEACE



6.3 Enabling administrative, VfM, M&E and QA processes

CRIDF cannot function without an enabling administrative environment, and a core of permanent staff. Without going into details that have been better described elsewhere, these functions include the following;

- Standard Operating Procedures that enable the Facility to prosecute projects;
- M&E of all the stages of the process to ensure that the objectives of the “From Projects to Peace” strategy is being met;
- QA of all stages of the process to ensure that all produces are produced to a high standard and with due diligence;
- The VfM evaluation of every Activity;
- The development of Project Implementation Plans (PIPs) – described in the following section; and
- Staffing the Facility, Projects and Activities; ensuring that all staff have clearly defined roles, accountabilities and responsibilities.

7 Implementing the Strategy

7.1 Introduction

The delivery of projects (which will ultimately lead to infrastructure) lies at the core of CRIDF's business plan. However, realising the impact; *"Peaceful and climate resilient management of shared water resources in SADC for the benefit of the poor"* requires a number of supporting and enabling functions and thematic approaches, as well as the selection and CRIDification of projects. The diagram in Section 6.2 ties these functions, approaches and functions into a broad framework. Implementing this framework and hence the Projects to Peace Strategy lies in the way the projects are selected and prosecuted. This in turn rests on two key tools in the CRIDF toolbox;

- The Project Screening Tools; and
- The Project Implementation Plan

This final section of the summarises how these tools, used together with the enabling and supporting functions and thematic approaches, will enable CRIDF to move from demand driven projects addressing key regional challenges, to longer term peace dividends.

7.2 A broad mix of projects

CRIDF must take on a broad mix of projects addressing a range of water issues critical to the SADC region, while addressing key thematic approaches through the design and implementation of activities and projects. Being a demand driven program, and at least until the Facility is fully established in the region, the Facility will need to take on projects that may not address its full mandate. In order to ensure these make a substantial contribution to the impact projects may have to be 'CRIDified'. Initially projects will emerge (and have emerged) from demands expressed through regional and basin plans, as well as interactions with stakeholders. These are, by their nature and national and regional priorities, and are generally pro-poor. However, not all of these projects have immediate and clearly articulated transboundary, or climate resilience benefits. Fewer still will directly contribute to sustainable regional peace dividends. This section outlines how these aspects will be progressively built into projects.

Initially;

- The Facility will be entirely demand driven – taking on projects identified through regional and basin plans or through direct interaction with stakeholders.
- This will be used to establish the Facility in the region and developing a 'political licence to operate' in the host countries and basins.
- Delivery of some small scale infrastructure for key stakeholders through internal sources will guarantee delivery, and will help establish the Facility as a trusted advisor.
- This will enable the Facility to introduce key concepts, or to influence the roll out of the projects to increase their contribution to the overall impact.

Nonetheless;

- All projects will be CRIDified by developing a project plan which specifically addresses how their contributions to each of the sub-strategies could be increased. This is addressed in more detail in the following section.
- These PIPs will include quarterly spending projections and assessments the extent to which capital may be internally or externally funded using the guidelines outlined in section 5.4.

- These PIPs will be reflected in each ToR for Activities under that Project, and will be used to ensure that specific tasks required to CRIDify the project and to ensure that it is monitored are built into the Terms.
- The project plan may be modified after each successive Activity has been completed as more information come available.

Managing the pipeline;

- In order to maintain oversight over the project pipeline, the information contained in each project plan will be combined into overall spending projections, as well as assessments of the overall contribution of the pipeline to the sub-strategies.
- This will include assessments of the overall contribution the pipeline makes to the overall Projects to Peace strategy, as well as the contributions it makes to each sub-strategy
- This will be reported as part of the Quarterly Reports.

In the longer-term;

- As projects in the existing pipeline drop out or are completed; the Facility will work with stakeholders to proactively identify projects that will make greater contributions to its Strategic goals – these will be in more climate vulnerable areas, may include water, food and energy components, and may involve beneficiaries in several countries.
- Internal funding of the capital of these ‘new’ projects will be gradually reduced, both because of the reducing timeframes for construction, but also because relationships with potential funders would be gradually strengthened.
- Any potential extension of the Facility beyond the 4 year timeframe, at any stage, would be built into this longer-term strategy based on; the experiences to that point; establishment of the Facility in the region, spending to that point; and project pipeline.

7.3 The Project Screening tools

CRIDF projects will be taken through the following screens;

- Screen 1: Eligibility
- Screen 2: Bankability
- Screen 3: Financial Closure
- Screen 4: Implementation

However, it is accepted that some projects may not reach the implementation phase during CRIDF’s lifetime, although every effort will be extended to ensure that stakeholders are left with sufficient information to take the project to implementation. This will affect both the prioritisation of projects as well as when any new projects may be initiated. Given that the lifetime of CRIDF may be flexible, this would be continually revised.

<Charles to provide the diagram and comment / add>

7.4 The Project Implementation Plans

The delivery of projects which address CRIDF’s mandate lies at the heart of the Facility’s business model. Increasing the contributions each project makes to the overall Projects to Peace strategy will therefore form an important part of achieving the Facility’s expected impact. This will be done through developing a Project Implementation Plan (PIP) after the eligibility, and screen 2a stages. These PIPs

will ensure that proactive action is taken not only to include build in tasks that address the contents of each screens, but also to ensure that the thematic approaches are adequately considered. The PIPs may be modified after each Activity is completed – based on the updated information.

These Project Implementation Plans would have the following structure;

PROJECT IMPLEMENTATION PLAN FOR <Name and Number of the Project>

Technical Project Manager, Commercial Project Manager

This would identify the **Technical Project Manager**, ultimately accountable and responsible for the prosecution of the project, and ensuring that it is CRIDfied, achieves its objectives and contributes to the Logframe Outputs, Outcomes and Impact. The **Commercial Project Manager** would also be identified, this person would be responsible for ensuring resourcing the Activities under the Project, and ensuring that the Activities are delivered on time and within budget. This person would also ensure that the PIP is taken up in the portfolio/pipeline.

Project description

A brief description of the project as a whole, and the expected result once it is all fully completed (this may include elements that are delivered after the CRIDF timeframe). In addition to the Project Managers; The Project would have the following attributes; Country (ies); Basin (s); Internal and External capex.

Why CRIDF is engaging the Project?

An outline of why the project is important to CRIDF, where it came from, and how it contributes to the Projects to Peace Strategy, and how the 'principles' (section 2) are being addressed.

A rollout plan

An outline of the various stages of the project, and the overall plan for executing the project. This would include any actions that would be taken to introduce related key concepts to the 'right people and the right levels'. It would draw on the content required by the screening processes, describing when (in yearly quarters) Terms of Reference for Activities would be initiated, and what stages (screens) various components of the project are expected to be completed inside the CRIDF timeframe.

The contribution to the thematic approaches

A qualitative assessment of the relative contribution the project will make to each of the thematic approaches, and actions that can be taken to increase these contributions (see Annex 1).

The contribution to the Logframe

This will describe the contribution the project will make to the Outputs and Outcomes.

The quarterly spend plan.

This would include a projection of the expected technical assistance spend and capital expenditure, as well as an indication of whether the capex will be internally or externally sourced (see section 5.3).

7.5 Managing the pipeline

While the prosecution of projects through the screening process lies at the heart of the CRIDF, the Outputs, Outcomes and Impact will be delivered by the entire pipeline or portfolio of projects. It will therefore be important to manage the pipeline, ensuring that collectively the projects provide adequate geographical coverage (Countries and Basins); that all the key thematic approaches are being addressed; that accumulated expenditure will reach spending targets.

This will be done through collating the information in the PIPs such that total Facility spending on TA, and Capex, as well as the relative contributions to the thematic approaches (using the information derived from Annex 1) can be derived and reported.

ANNEX 1: Assessing the Project contribution to the Logframe

Thematic approach	Assessment Criteria	Relative Contribution (High, Medium, Low)
Transboundary contribution, SADC priorities, and CRIDF principles	An assessment of; <ul style="list-style-type: none"> • The extent to which the project would build cooperation in one or more CRIDF focus countries. • Whether the project would lead to an improved understanding of implementation of Revised SADC Protocol on Shared Watercourses in support of cooperation. • The extent to which the project aligns with SADC priorities and the CRIDF principles (Section 2). • Actions the Project should do to increase these aspects. 	
Basin Strategy / Basin Characteristics	An assessment of; <ul style="list-style-type: none"> • The extent to which the project aligns with water resources characteristics of and strategy for the basin (Section 3). • The extent to which the project aligns with basin priorities or basin plans. • The involvement with the River Basin Organisation in the identification and management of the project. • Actions the project could do to better align with the basin characteristics. 	
Small Dams	An assessment of; <ul style="list-style-type: none"> • The contribution the project can make to the small-dams approach. • The extent to which the project will address the criteria outlined in section 4.4. • Actions that should be taken to include these aspects. 	

Climate resilience	<p>An assessment of;</p> <ul style="list-style-type: none"> • The exposure of the beneficiaries to climate change (increased temperatures, reduced rainfall/runoff) • The impact of these changes on the beneficiaries and their ability to predict, manage or mitigate these impacts. • The vulnerability of the beneficiaries based on the ability of the competent authorities and the economy to cope with the wider impacts. • The vulnerability based on diversifying livelihoods strategies. • Actions the project can viably do to address these aspects. 	
Stakeholders	<p>An assessment of;</p> <ul style="list-style-type: none"> • The extent to which the project addresses the stakeholders immediate needs; • The importance of the project in terms of national priorities; • The value of the project proponents as future CRIDF champions and supporters; 	
Water, food and energy	<p>An assessment of;</p> <ul style="list-style-type: none"> • The extent to which the project addresses more than one of these sectors; • The extent to which the project allows the strategic concept to be introduced. 	
Pro-poor	The extent to which the project directly contributes to improving the livelihoods of the poor.	
Overall contribution	The percentage contribution of the project to the Project to Peace strategy assuming; High = 3, Medium = 2, and Low = 1.	

Note: It is accepted that not all projects can have 'High' contributions for all these factors, and some may have 'Low' for several factors – but may be important for other reasons. However, the project pipeline as a whole should have several projects which mark 'High' for each factor.