AWARD

USAID RESILIM-O

ANNUAL REPORT

OCTOBER 2013 - SEPTEMBER 2014

USAID FROM THE AMERICAN PEOPLE | SOUTHERN AFRICA

ACKNOWLEDGEMENTS

The USAID: RESILIM O project is funded by the U.S. Agency for International Development under USAID/Southern Africa RFA-674-12-000016 RESILIENCE IN THE LIMPOPO BASIN PROGRAM (RESILIM). The project is implemented by the Association for Water and Rural Development (AWARD), in collaboration with partners.

Association for Water and Rural Development (AWARD)

Company Reg. No. 98/03011/08
P O Box 1919
Hoedspruit 1380
Limpopo
South Africa

Non-profit org. Reg. No. 006 – 821
Tel: 015-793 0503
E-mail: sharon@award.org.za
Website: www.award.org.za
Cooperative Agreement nr AID-674-A-13-00008

Structure **of this report**

This report has been structured for multiple readers and will evolve into an online publication. It includes activities from the last quarter (July to September 2014), in addition to cumulative annual report from 2014.

It has been split into four sections as follows:

01 OVERVIEW

This section is for readers who want a quick overview of the report and the project. It contains a note from the Director of AWARD, summarizing key moments of the year (2014); an explanation of the USAID: RESILIM O project within the context of the USAID regional program; an executive summary ;and an orientation to Section 2 of this report.

02 FEATURING THE LAST QUARTER AND THE YEAR

This section highlights key aspects of the USAID: RESILIM O project over the last quarter (July to September 2014), and the aspects are taken together with earlier reports to account for 2014 as a whole.

03 PROGRESS AND RESULTS

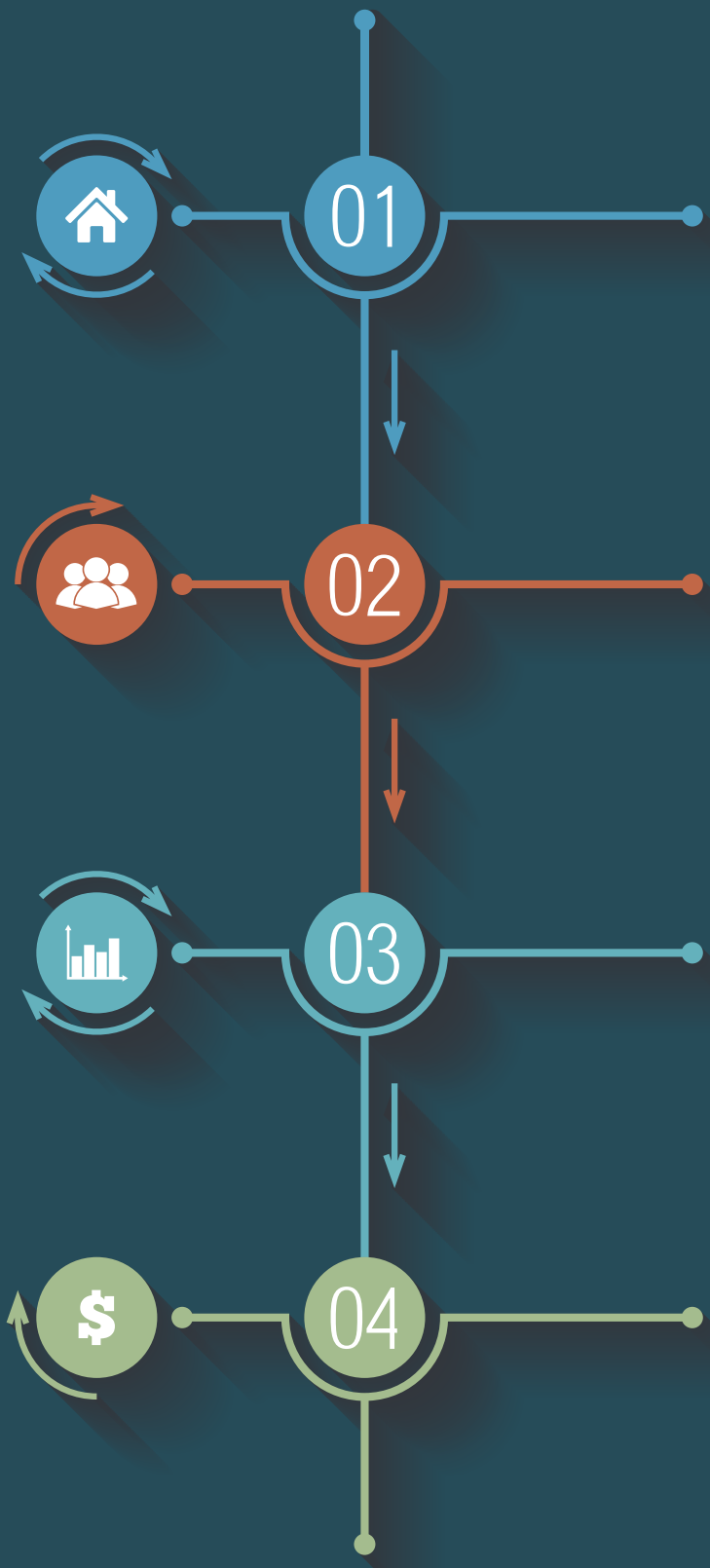
This section provides an overview of progress against the objectives and indicators of the USAID: RESILIM O project for the year (2014).

04 FINANCIAL REPORTING

This section contains the financial report and highlights how the financial assistance of USAID has contributed to the various key activities for the year.

Contents

Quarterly **and annual reporting**



Overview

For readers who want a quick overview of the quarter and project

Featuring the last quarter and the year

Highlights from the quarter and the year 2014

Progress & results

Qualitative and quantitative reporting against project objectives

Financial reporting

Financial reporting for the quarter and the year 2014

Acronyms & **abbreviations**

AEC	Alternative Ecological Category
AHEAD	Animal & Human Health for the Environment and Development
APP	Annual Performance Plan
AQMP	Air Quality Management Plan
ARC	Agricultural Research Council
AWARD	Association for Water and Rural Development
B2O	Back 2 Office
BBOP	Business and Biodiversity Offsets Program
BBR	Bushbuck Ridge
BD	Biodiversity
BGIS	Biodiversity-GIS
BLSA	Bird Life South Africa
BMP-E	Biodiversity Management Plans for Ecosystems
BMP-S	Biodiversity Management Plans for Species
BSP	South African National Parks Biodiversity Social Projects
BSSA:	Biodiversity Stewardship South Africa
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CBD	Convention on Biological Diversity
CBNRM	Community Based Natural Resource Management
CC	Climate Change
CDM	Capricorn District Municipality
CEPF	Critical Ecosystem Partnership Fund
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLaRA	Communal Land Rights Act of 2004
CMA	Catchment Management Agency
CMF	Catchment Management Forums
COGTA	Department of Co-operative Governance and Traditional Affairs
CoP	Conference of the Parties
CPA	Communal Property Association
C-Plan	Conservation Plan
CR	Critically Endangered
CRDP	Comprehensive Rural Development Program
CREW	Custodians of Rare and Endangered Wildflowers
CSIR	Council for Scientific and Industrial Research
DAFF	Department of Forestry and Fisheries
DARDLA	Department of Agriculture, Rural Development and Land Administration
DCAs	Damage Causing Animals
DEA	Department of Environmental Affairs
DMR	Department of Minerals and Resources
DRDLR	Department of Rural Development and Land Reform
DS	Desired State
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
EDRR	Early Detection and Rapid Response (program dealing with invasive alien species)
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EM	Environmental Monitors
EMF	Environmental Management Framework
EMI	Environmental Management Inspector
EMP	Environmental Management Plan
EMZ	Environmental Management Zone
EPIP	Environmental Protection and Infrastructure Program
EPWP	Expanded Public Works Program
ER	Ecological Reserve
ES	Ecosystem Services
ESA	Ecological Support Area
EWT	Endangered Wildlife Trust
FEPA	Freshwater Ecosystem Priority Area
FES	Forestry Economic Services
FMD	Foot and Mouth Disease
FPA	Fire Protection Association
GDARD	Gauteng Department of Agriculture and Rural Development
GEF	UNDP Global Environment Facility
GEF PA	Global Environment Facility Protected Areas
GIS	Geographic Information Systems
GLTFCA	Great Limpopo Transfrontier Conservation Area
GLTP	Great Limpopo Transfrontier Park
GMO	Genetically Modified Organism
GNP	Gonarezhou National Park
GRU	Game Reserves United
HRA	Heritage Resources Act
HWC	Human-Wildlife Conflict
IAP	Invasive Alien Plants
I&Aps	Interested and Affected Parties
IAS	Invasive Alien Species
IBCF	Integrated Biodiversity Conservation Framework
ICM	Integrated Catchment Management
IDP	Integrated Development Plan
IMP	Integrated Management Plan
IP&Aps	Integrated Pollution and Water Management
IPCC	Intergovernmental Panel on Climate Change
ISP	Internal Strategic Perspective
IUCMA	Inkomati Usutu Catchment Management Agency (formerly ICMA)
IUCN	International Union for the Conservation of Nature
IWRM	Integrated Water Resource Management
K2C	Kruger to Canyons
K2C NCU	Kruger to Canyons Network Coordinating Unit
KNP	Kruger National Park
LED	Local Economic Development
LEDET	Limpopo Economic Development, Environment and Tourism
LH	Livelihoods
LIB	Loskop Dam Irrigation Board
LIMCOM	Limpopo Watercourse Commission
LOCORES	Lowveld Coordinated Research Forum
LT	Least Threatened

LUMB Land Use Management Bill
LUMS Land Use Management System

MA Millennium Ecosystem Assessment
MAB Man and Biosphere
MBCP Mpumalanga Biodiversity Conservation Plan
MCM Marine and Coastal Management Branch of DEA
MDEDET Mpumalanga Department of Economic Development, Environment and Tourism
M&E Monitoring and Evaluation
METT Management Effectiveness Tracking Tool
MOU Memorandum of Understanding
MOZBIO Mozambique Biofuel industry
MPA Marine Protected Area
MPB Mpumalanga Parks Board
MTPA Mpumalanga Tourism & Parks Agency

NBA National Biodiversity Assessment
NBF National Biodiversity Framework
NBSAP National Biodiversity Strategy and Action Plan
NEMA National Environmental Management Act **NEMBA** National Environmental Management: Biodiversity Act
NEMPA National Environmental Management: Protected Areas Act
NFA National Forests Act
NFEPA National Freshwater Ecosystem Priority Areas
NFSD National Framework for Sustainable Development
NGO Non-Governmental Organization
NP National Park
NPAES National Protected Area Expansion Strategy
NPC Non-Profit Company
NR Nature Reserve
NRM Natural Resource Management
NRMP Natural Resource Management Program/ Plan
NSBA National Spatial Biodiversity Assessment
NSDP National Spatial Development Perspective
NSoER National State of Environment Report
NSSD National Strategy for Sustainable Development
NWA National Water Act

OLEMF Olifants and Letaba Environmental Management Framework
OLLI Olifants. Luvuvhu, Letaba, Inkomati technical operations committee
OMPA Offshore Marine Protected Area project
ORC Olifants River Catchment
ORF Olifants River Forum

PA Protected Area
PES Present Ecological State
Payments for Ecosystem Services
PNR Private Nature Reserve

RDL Red Data List
REC Recommended Ecological Category
RESILIM Resilience in the Limpopo River Basin Program
RESILIM B Resilience in the Limpopo River Basin Program (Basin project implemented by Chemonix)
RHP River Health Program
RQO Resource Quality Objective
RSDF Regional Spatial Development Framework

SABIF South African Biodiversity Information Forum
SAEON South African Environmental Observatory Network
SAIAB South African Institute for Aquatic Biology
SANAP South African National Antarctic Program
SANBI South African National Biodiversity Institute
SANCOR South African Network for Coastal and Oceanic Research
SANParks South African National Parks
SAPIA Southern Africa Plant Invader Atlas
SAWC South African Wildlife College
SBP Systematic Biodiversity Planning
SCPE Sekhukhuneland Centre of Plant Endemism
SDF Spatial Development Framework
SEA Strategic Environmental Assessment
SEMP Strategic Environmental Management Plan
SES Social-Ecological System (also/ previously Socio-Ecological System)
SH Stakeholder(s)
SIBIS SANBI's Integrated Biodiversity Information System
SKEP Succulent Karoo Ecosystem Program
SOER State of Environment Report
SQR Status Quo Report
SRP Social Responsibility Program
STEP Subtropical Thicket Ecosystem Planning
SUAR Sustainable Utilisation of Agricultural Resources Bill

TB Tuberculosis
TEEB The Economics of Ecosystems and Biodiversity
TFCA Transfrontier Conservation Area
TOPS Threatened or Protected Species

UNDP United Nations Development Program
UNESCO United Nations Educational Scientific and Cultural Organization
USAID United States Agency for International Development

VSTEEP Values, Social, Technical, Ecological, Economic, Political
VU Vulnerable

WCS Wildlife Conservation Society
WESSA Wildlife and Environment Society of South Africa
WfW Working for Water
WMA Water Management Area
WoF Working on Fire
WRC Water Research Commission
WRF Wits Rural Facility
WWF-SA World Wide Fund for Nature, South Africa

01
OVERVIEW

This section is for readers who want a quick overview of the report and the project. It contains a note from the Director of AWARD, summarizing key moments of the year (2014); an explanation of the USAID: RESILIM O project within the context of the USAID regional program; an executive summary ; and an orientation to Section 2 of this report.

A note from **the director**

We are firmly out of the starting block when it comes to our work on USAID: RESILIM O. Whether we are talking about our internal governance or progress on deliverables, we are seeing results coming in, both for the last quarter and cumulatively for 2014. We are also gearing up to work collaboratively with a range of partners based on what we have learnt about the current state of the catchment and its stakeholders.

INTERNAL GOVERNANCE

Internal governance and co-ordination are critical in a complex project such as USAID: RESILIM O, otherwise there is a perception that members of the different teams have no need to work together. This results in each team trying to address only its own specific indicators. Moving away from this has been facilitated by RESILIM O monthly meetings, which are designed for learning and planning, as well as regular meetings between managers of the different themes. There is also a growing integration across the work we have contracted from other specialists in the field. Bi-annual team leaders meetings have become a place for this integration.

We have consistently devoted much attention to walking the talk – systemically speaking. Many talk about the need to take a holistic and systemic approach to natural resources management, yet there are not many examples out there. We are using the USAID: RESILIM O as an opportunity to create such an example. The idea of social learning as a process has also been important for us – and we are proud of the learning and innovation that has come out of this. As an organization, we firmly believe we learn through doing. It also humbles us: we are no longer in the telling mode, and understand first-hand that what we are trying to do in USAID: RESILIM O is quite difficult because it is set to transform resource management moving into the future!

One of our reference group members, Professor Ray Ison, is also managing trans-boundary systemic projects. At the last reference group meeting, which took place this quarter, it was encouraging to hear that he believes the work we are doing on USAID: RESILIM O is a good example of how to do trans-boundary systemic projects.

In the last quarter, USAID: RESILIM O was audited under the Generally Accepted Government Auditing Standards (GAGAS), the standards that apply to financial and performance audits of government agencies in the USA. AWARD is proud to announce an unqualified audit. We also received an unqualified report on the statutory South African companies audit.

ORGANIZATIONAL CAPACITY

Very specific needs regarding key internal capacity gaps have arisen over the course of the last year. We have approached these according to our guiding values and principles as AWARD, seeking to employ and develop formerly excluded black South Africans. This presents challenges that perhaps other consultancies do not face. Our interns are receiving amazing mentoring, but it is going to continue to be a challenge going forward.

We are also proud of the number of people with whom we have engaged during the first social learning phase in both natural resource management and biodiversity conservation. All engagements are designed to provide opportunities for diverse stakeholders to learn together. The first stage of the learning is characterized by confrontation of the status quo so that participants realize there is an issue or problem to be addressed. The process from there on is situated in collaborative design and testing of ways to address real problems.

“We are firmly out of the starting block when it comes to our work on USAID: RESILIM O.”

Sharon Pollard
Director

COLLABORATIONS

In terms of our external collaborations, we have visited a sister USAID-funded project, the Southern Africa Regional Environmental Program (SAREP) in the Okavango; worked in an ongoing manner with the Greater Limpopo Transfrontier Conservation Area (GLTFCA); hosted a number of board members of the Tanzanian Ruaha water board who were here on a learning journey; and attended the SADC River Basin Organization meeting. We had ongoing meetings with our sister project, USAID: RESILIM B . Important engagements occured with the National GEF PA program, as well as meetings with John Colvin to explore establishing innovative social learning networks for regional programs with whom RESILIM O is partnering.

Additionally, we have internalized that there is inadequate collaboration between South Africa and Mozambique for trans-boundary governance, and we will be working on an institutional arrangement in the coming year.

SYSTEMIC APPROACHES TO MONITORING, EVALUATION AND LEARNING

One of the significant achievements over the last year has been to develop a Monitoring, Evaluation and Learning (MEL) system that is a hybrid of more traditional Monitoring and Evaluation (M&E) methods, and qualitative evaluation and monitoring. We have not perfected it yet, and in the last quarter, specifically, we worked to transform MEL from a linear process to one that deals with complexity. Surprisingly, we discovered that USAID is encouraging projects to consider "complexity-aware" monitoring and evaluations, and one of the methods we are drawing on has been highlighted in a discussion document by USAID in Washington. We hope our learning will contribute to understanding how we can build better M&E processes. We are still testing this approach and will include what we have learnt from this year in the design of next year's MEL framework.

WORKING WITH VULNERABLE PEOPLE

An area that needs ongoing innovation is the conflation/ simplification of what it means to work with the poor and the vulnerable. Responses like Community Based Natural Resource Management (CBNRM) initiatives and beneficiation through tourism are important strategies, but do not present the full picture. We are continually looking at ways of working with people who are not part of the formalized structures, who may struggle to make their voices heard. Huge amounts of time have been spent on our VSTEEP (Values, Social, Technical, Ecological, Economic, Political) process, which is a tool to help us understand points of leverage or points of vulnerability in relation to climate change, and other drivers, in a systemic way. This creates a platform for consultation outside of the traditional channels, where poor people are often excluded. Thanks to our work in this area, we can now plot scenarios based on emerging systems diagrams that will feed into our resilience assessment and inform our work going forward. This resilience assessment is the framework that will guide stakeholder engagement and hold most of our activities in 2015 and beyond. It has been framed in such a way as to reflect a systemic view of the Olifants catchment and, as a result, it pulls the outcomes of all of our work packages and themes into a systemic picture. Through this process, we also show that you can actually develop systemic practices quite quickly. Institutionalizing this approach is the next challenge.

> *We're continually looking at ways of working with people who aren't part of the formal networks, who may struggle to make their voices heard.*
>
> ***Sharon Pollard***
> *Director*

WORK PACKAGES

The work packages are delivering results. We have started to understand the notion of water security/ insecurity much better. And we are also beginning to understand the systemic meaning of bad water quality and water deficits in various areas, and track them through the system. Another key realization has been just how hard it is to give effect to policies like environmental water requirements. Within the area of biodiversity and conservation, some key institutional "disjuncts" have also been identified, allowing AWARD to work more strategically with partners to increase alignment between policy and practice, and to roll out interventions to improve biodiversity governance.

In terms of challenges, we have realised that land claims are a significant driver in the system. Not knowing where they are spatially or what their status is hobbles us. We cannot move forward with promoting sustainable land use practices if we do not know who the new owners of the land are, or when the claim is coming through.

CLIMATE CHANGE

Understanding the threats and vulnerabilities in the catchment with regard to climate change is a cross-cutting concern. The number of global climate change models that tell contradictory stories for the Olifants catchment means we have our work cut out for us in terms of really understanding it in this context.

What we have done so far is to look at climate change impacts on water resources, as these are important from many angles: for instance, food security and disaster management. We are in the process of completing the modeling of this. The emerging story is that total amounts of water resources will not change – but how they are delivered will change. We are looking at people needing to adapt to the tail ends of a normal distribution.

We can say definitively that there are very few institutions in the Olifants catchment that are thinking about climate change. We will address this through our resilience assessment and stakeholder engagement processes. These will remain a major focus going into 2015.


1


2


8

> *We're also proud of the number of people with whom we have engaged in the first social learning phase in both natural resource management and/ or biodiversity conservation. All engagements are designed to provide opportunities for diverse stakeholders to learn together.*


3


4


7


6


5

Executive **summary**

Previous page:
Clockwise from top left

1. *Young men collecting water to sell.*
2. *Traditional leaders and elders from the Penge community.*
3. *Testing water quality.*
4. *A headwoman addresses her community.*
5. *Broom sellers.*
6. *A community member gives a system view of his context.*
7. *Young female grape farmers.*
8. *Processing mineral wealth outside Burgersfort.*

2014 was a year in which the project consolidated its efforts to gain a better understanding of the social, ecological, and political context of the Olifants basin. These activities directly supported the overarching goal of the program, which is to adopt science-based strategies that enhance the resilience of people and ecosystems through systemic and social learning practices. Understanding context is equally important for any social learning process, and is the first step to developing an adaptive management approach. The ability to respond is core to building resilience governance, and understanding of context is the first step towards this. For example, the project has now identified individual drivers of climate change and vulnerability in the basin, which informs the next step – working with stakeholders to increase their own understanding in so as to broaden collective response options. In the same vein, an understanding of the institutional arrangements for water resource management in South Africa and Mozambique positions the project to support institutions in order to build their adaptive capacity. This is also relevant for the biodiversity sector, where an understanding of different governance/ institutional arrangements is enabling the project to work towards addressing misfits, non-alignment hindering resilience, and biodiversity conservation.

This approach – considerably different to a conventional vulnerability assessment – is a key innovation for the year. A variety of sub-contracts and work packages are collated to develop this contextual understanding – not only in terms of the scientific studies of the catchment (i.e. water quality and balance), but also in terms of institutional structures and constraints; stakeholder engagement (which includes issues of power and agency); and trans-boundary opportunities and challenges. Much of this work was produced by subcontracts, awarded to a variety of consulting agencies, research groups, and partners who specialize in particular areas under the Themes one, two and three, as part of Phase one of the project (i.e. the first two years). AWARD played a leading role in both coordination and research implementation.

Working with scientists and communities to understand context, however, also created opportunities to engage directly with stakeholders in the first phases of social learning, which enhances their capacity to respond to the effects of climate change. Up to date, the project has engaged over 400 different institutions and organizations, ranging from international, regional to local within the Olifants catchment. These included LIMCOM; Department of Water and Sanitation(DWS); provincial government departments like LEDET, MTPA, Loskop Dam Irrigation Board (LIB), district municipalities, mines and commercial agricultural organizations. Working with these institutions during this quarter enabled AWARD to build the capacity of over 1400 individuals to respond to the effects of climate change. A shared discourse is being developed with these individuals and institutions through a variety of meetings, workshops, networking events, as well as through social media and other communications.

One of the core aspects of the project is the co-ordination and institutionalization of resilience-focused practices within the architecture of natural resource management. Central to this is collective action whereby a spectrum of stakeholders and partners, structured around a social learning process, strive for transformation of the Olifants catchment towards a more resilient catchment.

This sets us up for the next year, where all of the learning and research will be harnessed for further implementation of resilience-building activities with our existing and emerging stakeholders.

Responding **to a changing world**

Next page:

Girls collect water from a damaged pipe.

In just 60 years, the world's population has accelerated from 2.5 billion people to 7 billion people today. By 2050, another 2 billion will join our planet – mostly in developing countries – increasing the rapidly growing demand for our planet's resources. These problems are exacerbated by global climate change. A changing climate will undermine the livelihoods of millions of people struggling to break free from poverty, USAID works to end global poverty and support resilience and democracy.

ABOUT USAID: RESILIM

USAID's Resilience in the Limpopo Basin (RESILIM) program is designed to address ongoing degradation in the Limpopo River Basin in southern Africa, where people face water shortages, increased floods, and declines in crop productivity as climate change further stresses an already water-limited region.

There are two components to the program: One – operating at a basin scale (USAID: RESILIM B); and two – operating at a catchment scale (USAID: RESILIM O). They share the same overall objectives.

USAID: RESILIM OBJECTIVES

OBJECTIVE 1

To reduce (climate) vulnerability by promoting the adoption of science-based adaptation strategies for trans-boundary Integrated Water Resource Management (IWRM) and biodiversity conservation in the Olifants catchment.

OBJECTIVE 2

To enhance long-term water security and reduce (climate) vulnerability by supporting informed adaptation strategies for trans-boundary Integrated Water Resource Management (IWRM) in the Olifants catchment.

OBJECTIVE 3

To conserve biodiversity and manage sustainable high-priority ecosystems in the Olifants sub-catchment.

OBJECTIVE 4

To build the capacity of stakeholders to manage sustainable water resources and biodiversity in the Olifants catchment.

The AWARD team added more which refer to integration and learning:

OBJECTIVE 5

To facilitate the exchange of experience with other basins and especially catchments within the Limpopo basin.

OBJECTIVE 6

To ensure continuous reflective and collaborative processes that promote integration, synergies, and coherence between the preceding objectives.

The final objective pertains to enhancing internal governance and management:

OBJECTIVE 7

To develop and maintain internal organizational capacity and effectiveness through tenable management systems and sub-contract management.

Next page:

Young artist sells his work to make a living where formal jobs are scarce.

USAID: RESILIM B

USAID: RESILIM B (B refers to Basin) facilitates trans-boundary cooperation at a basin level to prevent further degradation of critical river ecosystems; to secure biodiversity and ecosystem services; and to support robust livelihoods in the Limpopo basin. The five-year program supports the integrated water resources management objectives of LIMCOM, which falls under the Southern African Development Community (SADC), by working with stakeholders from Botswana, Mozambique, South Africa, and Zimbabwe. This basin-wide project is being implemented by Chemonics (www.chemonics.com).

USAID: RESILIM O

USAID: RESILIM O focuses on the Olifants catchment and the way in which people living in South Africa and Mozambique depend on the Olifants and its contributing waterways. It aims to improve water security and resource management in support of the healthy ecosystems which support livelihoods and resilient economic development in the catchment. The five-year program, involving the South African and Mozambican portions of the Olifants catchment, is being implemented by the Association for Water and Rural Development (AWARD: www.award.org.za).

> *"USAID's RESILIM O program aims to reduce the vulnerability of people and ecosystems through improved trans-boundary governance and management of natural resources. The program is grounded in a grassroots approach to understanding the systemic causes of vulnerability, including climate vulnerability, and promoting new ways of thinking and acting to promote integrated water and biodiversity management."*

AWARD's **approach**

> *Our approach has always been one that involves thinking across disciplines, boundaries and systems. We have a record of designing practical interventions to address the vulnerability of people and ecosystems.*

At AWARD, we recognize that the natural world's resources are limited, and undergoing rapid depletion and transformation. We know current practices of use and management are inadequate to deal with the changes and challenges we are facing.

Our approach has always been one that involves thinking across disciplines, boundaries, and systems. We have a record of designing practical interventions to address the vulnerability of people and ecosystems, and merge considerations from both environmental and social perspectives.

We specialize in participatory, research-based project implementation aimed at addressing issues of sustainability, inequity, and poverty, by building natural-resource management competence and supporting sustainable water-based livelihoods. Our work helps provide a foundation for robust development policy and practice in South Africa that can stand up to an increasingly complex world.

Our innovative work with USAID: RESILIM O involves not only quality science studies towards developing an inter-disciplinary assessment of the Olifants River, but also an engagement with the socio-political context of the catchment. The realm of politics and scarce resources is fraught with complexity and we know that change is mediated in deeply social and political processes. Our focus on systems thinking and social learning are key innovations of this project, designed to institutionalize integrated, resilience-based practices in the Olifants River basin.

It calls on people and organizations working in the water and biodiversity sectors; community members; traditional authorities; farmers; the mining sector; research institutions; local and national government; and other interested and affected parties to be part of a process to develop a more resilient Olifants catchment.

Next page:

RESILIM O staff conduct a contextual profiling with community members.

SOCIAL LEARNING:

Definition from Arjen Wals: Social learning "is about collaboration and working together, and collaborative learning assumes that you learn in groups more than as individuals on your own." See this YouTube interview for a simple explanation of social learning and its importance in transforming the world in which we live: **https://www.youtube.com/watch?v=Ewv3cdGDZqA**.

Definition from Ray Ison: Social learning is "a process of socially constructing an issue with actors, through which their understanding and practices change, leading to transformation of the situation through collective and concerted action."

SYSTEMS THINKING:

Definition from Ray Ison: "The understanding of a phenomenon within the context of a larger whole; to understand things systemically literally means to put them into a context, to establish the nature of their relationships ".
Thinking systemically means to understand context and relationships within that context.

Where are **we working**

Previous page:
Clockwise from top left

1. *Healthy plants, healthy people.*
2. *Unemployment amongst youth in the catchment is high yet this group remains positive.*
3. *Sophisticated mining operations and rural livelihoods occur side by side.*
4. *Regulation through disincentives does not seem to work here.*
5. *Despite humble dwellings people appear to be well connected through phones and media in some parts of the catchment.*
6. *Parts of the catchment are rich in wildlife. Natural resources provide materials for income generation.*

THE OLIFANTS CATCHMENT

"Our work on USAID: RESILIM O aims to improve how the Olifants River basin is managed," says AWARD's Executive Director, Sharon Pollard. The Olifants River and its contributing waterways are critical for supporting life in the area, "yet unchecked pollution, inappropriate land and resource use; weak and poorly enforced policies and regulations; and poor protection of habitats and biodiversity are degrading the Olifants at an alarming rate."

RESILIENCE SNAP SURVEY

During one of the team leaders meetings held in 2014, where specialist study leaders convene to discuss resilience building for the Olifants catchment, the following question was posed:

Based on your experience and your area of specialization, what concerns do you have regarding building resilience in the Olifants catchment?

The following represents a sample of answers provided:

"The identification of resilience practices needs a lot of thought. How to transform the current practices to improve the resilience of the basin, and work with government institutions to re-direct their ideas could be quite difficult."

"We need discussion on growth and development in towns and villages, and the difficulties of keeping pace with the service provision – which can interfere with resilience building."

"There is a lack of institutional capacity to build resilience."

"The catchment is rather broad. It is a challenge really to give all stakeholders attention in the social learning process. We need a way to continuously come up with strategies."

1

2

3

“The ability to respond is core to building resilience governance, and understanding of context is the first step towards this.”

6

4

5

SEE THE CATCHMENT THROUGH OUR EYES

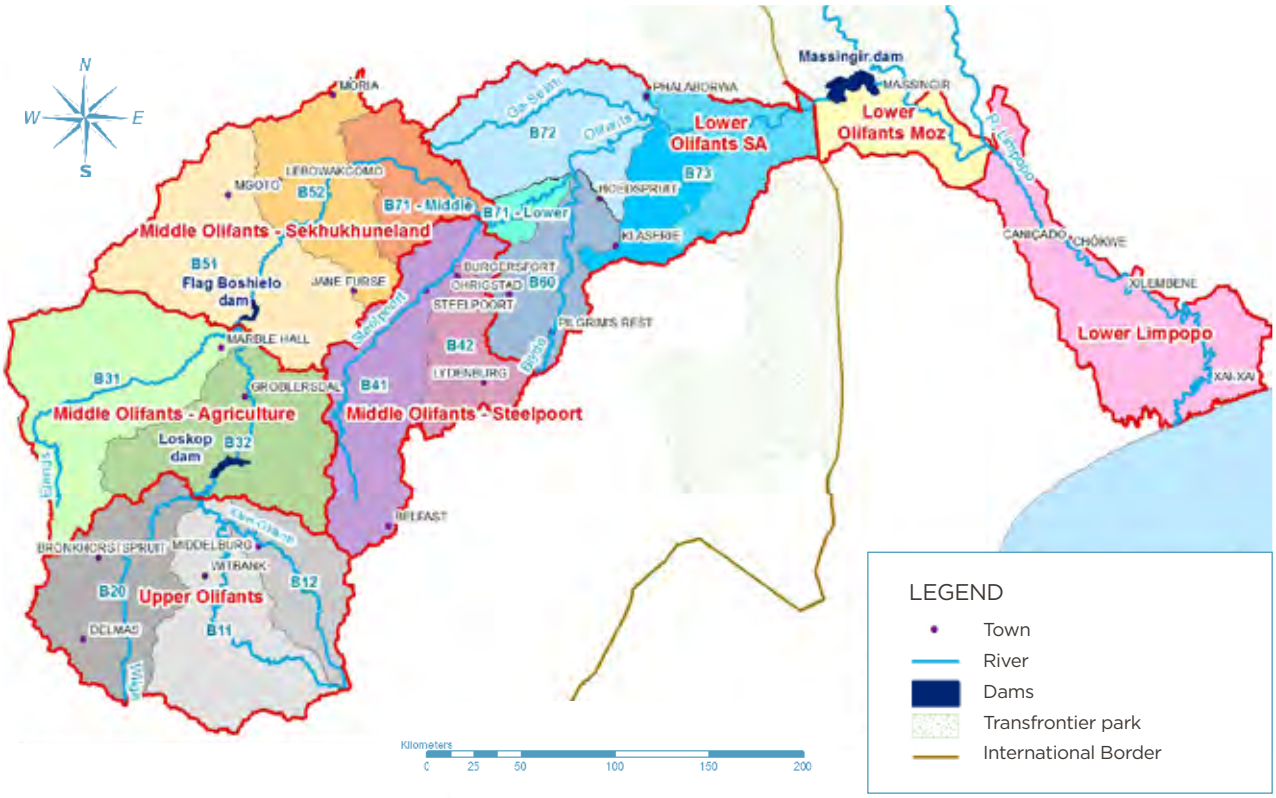
"Metal concentrations in fish muscle tissue from fish in the Flag Bashello Dam and Phalaborwa Barrage is at a level that could have serious implications for human health."

Researcher
University of Limpopo

"We collect water from the river to sell for the purposes of building. We do not sell the water for drinking, as the water here has bad luck ...it is dirty."

Water sellers
Steelpoort River

BOUNDING THE SYSTEM



There is an established set of Department of Water Affairs boundaries, with which many of the people we are working with are already familiar. It makes sense for USAID: RESILIM O to work within these, even from a biodiversity management point of view.

To make the information and learning that comes out of USAID: RESILIM O useful to the implementers in an obvious way, the catchment has been grouped further into working clusters that make pragmatic sense for the work AWARD will be doing in the Olifants catchment. These clusters are not based on any biophysical or political boundaries, but are simply a way of dividing the catchment around potentially similar practices.

In taking a systemic approach, though, we do not ignore what is outside of those bounds, which helps make explicit things we cannot change, but which may influence or have an impact in the areas where we work.

We have a water problem in our village, so we use water from the canal to drink, cook, and wash our clothes. Some people do their washing inside the canal; at times animals die inside, or we find soiled nappies, but we still drink the water because we do not have water in our village.

Alfred Manamela,
a subsistence farmer earning his living close to the Olifants River

Orientation **to the year**

THE OLIFANTS CATCHMENT

The USAID: RESILIM O project is divided into two phases. The first phase is a comprehensive and systemic resilience assessment of the Olifants River basin. The second phase is responding to this context through cluster-based professional development and learning, and a series of sub-grants that will focus on building practices which will enhance the resilience of the catchment.

This year (October 2013 to September 2014) has focused on consolidating the USAID: RESILIM O project framework for a resilience assessment (which included a phased orientation of new staff to the approach and methodologies of AWARD), and the initiation of a series of specialist studies to address crucial information gaps such as the status of mining and land distribution in the catchment.

More importantly, AWARD has begun the long-term process of coordinating and institutionalizing resilience-focused practices with the diverse stakeholders of the Olifants catchment. The first step towards a resilience assessment is understanding context. This process (as highlighted in the last quarterly report April-June 2014) entails exploring what a resilient Olifants catchment might mean. This is also the first step in a social learning process where diverse stakeholders together confront the context of the Olifants catchment and ask the question: "What is happening here?".

What the work of USAID:RESILIM O is saying is that context matters. Exploring context, however, is a complex, collaborative process of making meaning, and this involves stakeholders, in addition to engaging in more specialist studies. We feature our methodologies and discoveries from this exploration in Section Two of this report.

People of the catchment are important. In this report we highlight the importance of understanding the complex network of stakeholders in the Olifants catchment and the practices they engage in. This means understanding the diverse and divergent spectrum of institutions, industries, land-use practices, cultural identities, and notions of agency. This is fundamental if we are to work towards transformation through self-organization, working collectively, and being responsive to the changing context of the catchment, especially given challenges such as climate change.

We now have a record of over 400 institutions and 900 individuals in our stakeholder database. This is growing with each meeting or interaction. We are beginning to use the flexible functionality of this database to start tracking our ongoing engagement with stakeholders. In the new year we will begin tracking the stakeholder engagement patterns of particular organizations we see as vital for building resilience in the catchment, such as forums. We also have a growing number of stakeholder profiles. Two of these are featured in this report as an example of the vast disparities experienced in the catchment. We understand that responsivity will be different in each case, yet vulnerability and resilience both apply.

Above:

Fruit sellers of the catchment.

Next Page

A young girl pushes water home from a burst community pipe.

We have held workshops towards developing contextual profiles with stakeholders, using methods such as VSTEEP. We will have covered most of the major parts of the catchment and will complete this task early in 2015. Approximately 200 people from various sectors have participated in building a diverse picture of the context of the Olifants catchment. These pictures are being used to develop systems diagrams of each area which will be used in the second phase of social learning – deconstruction – where we ask the question: "How has it come to be like this?". This work is reported in Section Two.

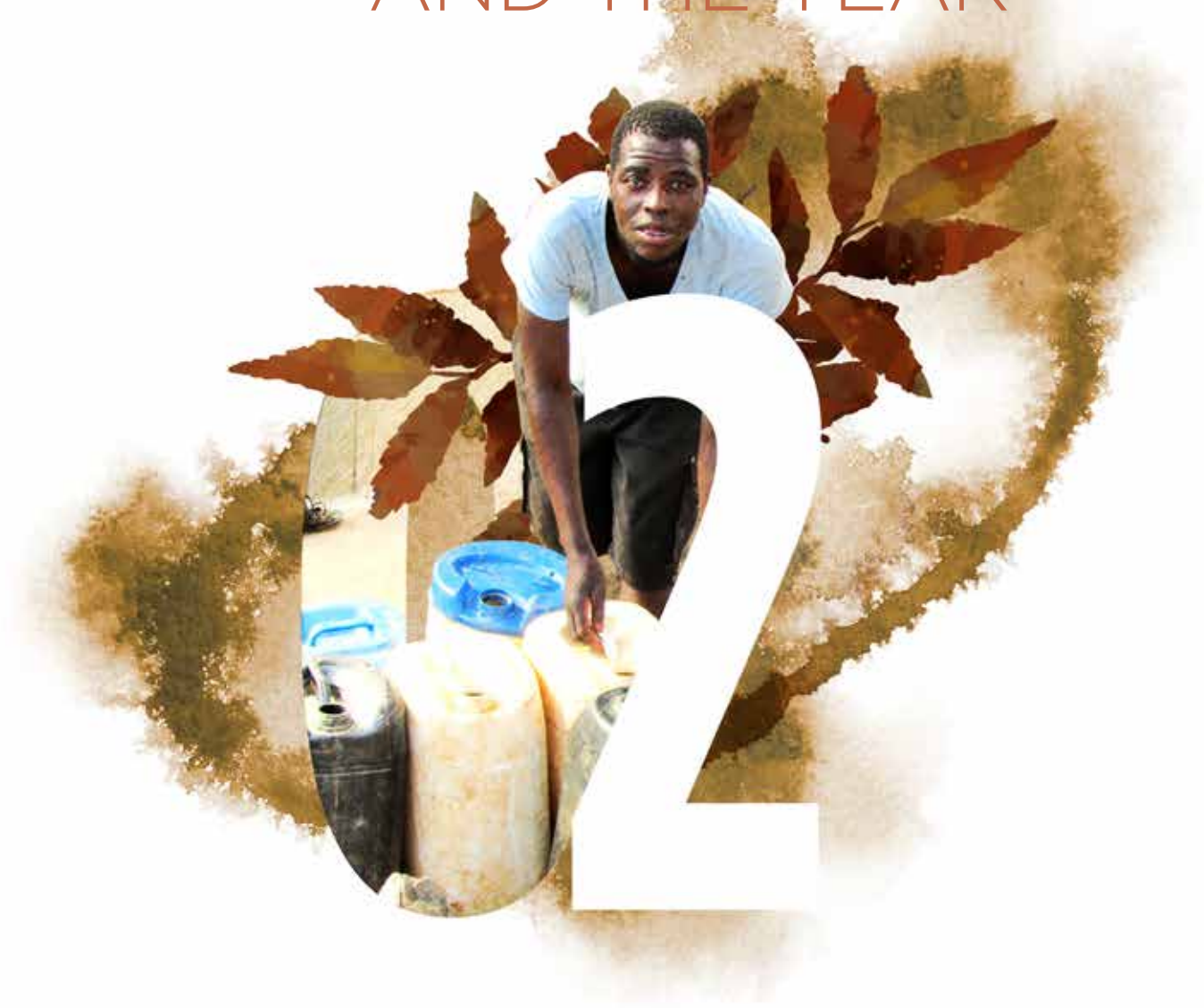
As reported in the "Note from the Director", several specialist studies are now completed or in draft format. These highlight important drivers in the catchment and work towards synthesizing much work done in the catchment over the past decades. This work is beginning to pull Mozambique research into the picture – something that has not happened in the past. The specialist studies are bringing many important issues to light. For example, the protected area stewardship package highlights how the institutional failure has led to a situation where many protected areas are not registered as such, or they are registered incorrectly. Staff from AWARD, as key partners to the research process, are untangling the web of misinformation and confusion. Through this process, we will be able to meet and possibly exceed the target in the Global Environment Facility Protected Areas (GEF PA) Program by facilitating an additional 60 000 hectares to be classified as protected areas within the catchment. In Section Three of this report we highlight the status and progress of all the specialist studies alongside reporting against the results framework. We also include narratives of significance, providing key insights which we will take forward into our work in the new year, such as a participatory and systemic understanding of vulnerability as core to the resilience assessment.

In the final section of this report, we report on the financials which have made all this work possible.

What is emerging from this work is a rich and systemic understanding of the context of the Olifants catchment, and this will become the basis for our work in the new year, in terms of the resilience assessment and building resilience practices. The work this year, through the use of systemic representations and stakeholder inputs, has contributed to a deeper understanding of core drivers in the catchment inhibiting or enhancing resilience. An innovative aspect of this process will be to understand how resilient-focused practices can either be enhanced or established in collaboration with key stakeholder groups such as municipalities, forums, and protected area managers. This process is the core transformative process of the project, the process of social learning.

> *In this report we highlight the importance of understanding the complex network of stakeholders in the Olifants catchment and the practices they engage in. This means understanding the diverse and divergent spectrum of institutions, industries, land-use practices, cultural identities and notions of agency.*

02
FEATURING THE LAST QUARTER AND THE YEAR



This section highlights key aspects of the USAID: RESILIM O project over the last quarter (July to September 2014). These highlights are combined with earlier reports to account for 2014 as a whole.

Overview **of activities for 2014**

In this section we provide an overview and highlights of key activities, and we feature important methodological matters of the USAID: RESILIM O project for the 2014 reporting period. A full description of project targets, results, and research products is provided in Section Three.

As outlined in the project work plan, USAID: RESILIM O is executed as two phases. The project is currently in Phase One, which extends over the reporting period 2014-2015 and can be summarized as: contextual understanding; research; synthesis; and plans for innovation and testing. In this annual report we cover the period October 2013 to September 2014 and are therefore reporting on the first year of Phase One. This phase has a strong focus on a systemic and collaborative enquiry into the resilience of the Olifants catchment as a socio-ecological system (SES). This is done as a basis for understanding the multiple vulnerabilities to change, including climate change. To do this we intend building strong stakeholder networks as the basis for a collaborative, participatory understanding of vulnerability for the basin as a whole. Despite all the research done in the Olifants catchment, a synthesis is absent. This phase, therefore, will lay the foundation for resilience planning and action with multiple and diverse stakeholders.

Working with stakeholders: **pathways to institutionalization**

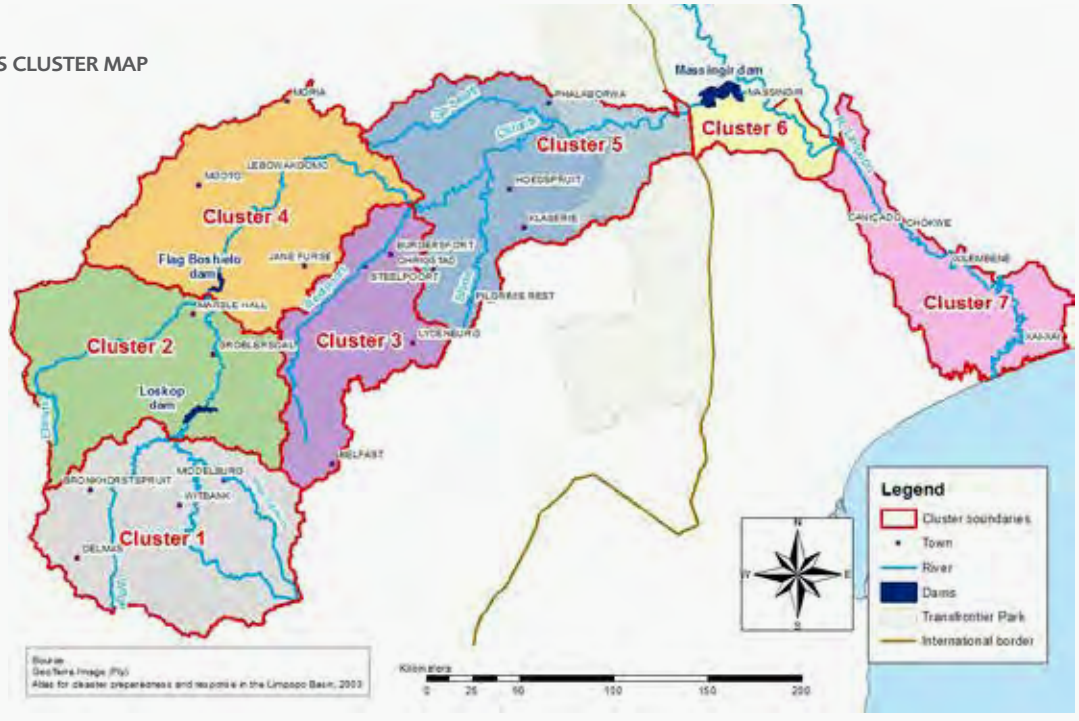
One of the core aspects of the USAID: RESILIM O project is the coordination and institutionalization of resilience-focused practices within the architecture of natural resource management. Central to this is collective action whereby a spectrum of stakeholders and partners, structured around a social learning process, strive for transformation of the Olifants catchment towards a more resilient one.

Coordinating an understanding of what a resilient Olifants catchment might mean is a first step in the process. Since the responsibility for resilience of the catchment cannot lie with one institution, it is important that the process is conducted collaboratively, strategically, and with transparency with a number of stakeholder groups or institutions. This implies that coordination and dialogue are central to the development of resilience. Building the platform for dialogue and collaboration is a key issue with which the project has been occupied during the first phase. Stakeholder engagement has taken a number of forms during the work period, but all of them are directed towards encouraging learning and transformation within a particular context. In this section, we provide insights into the progress that the project has made with stakeholder engagement as a basis for resilience building.

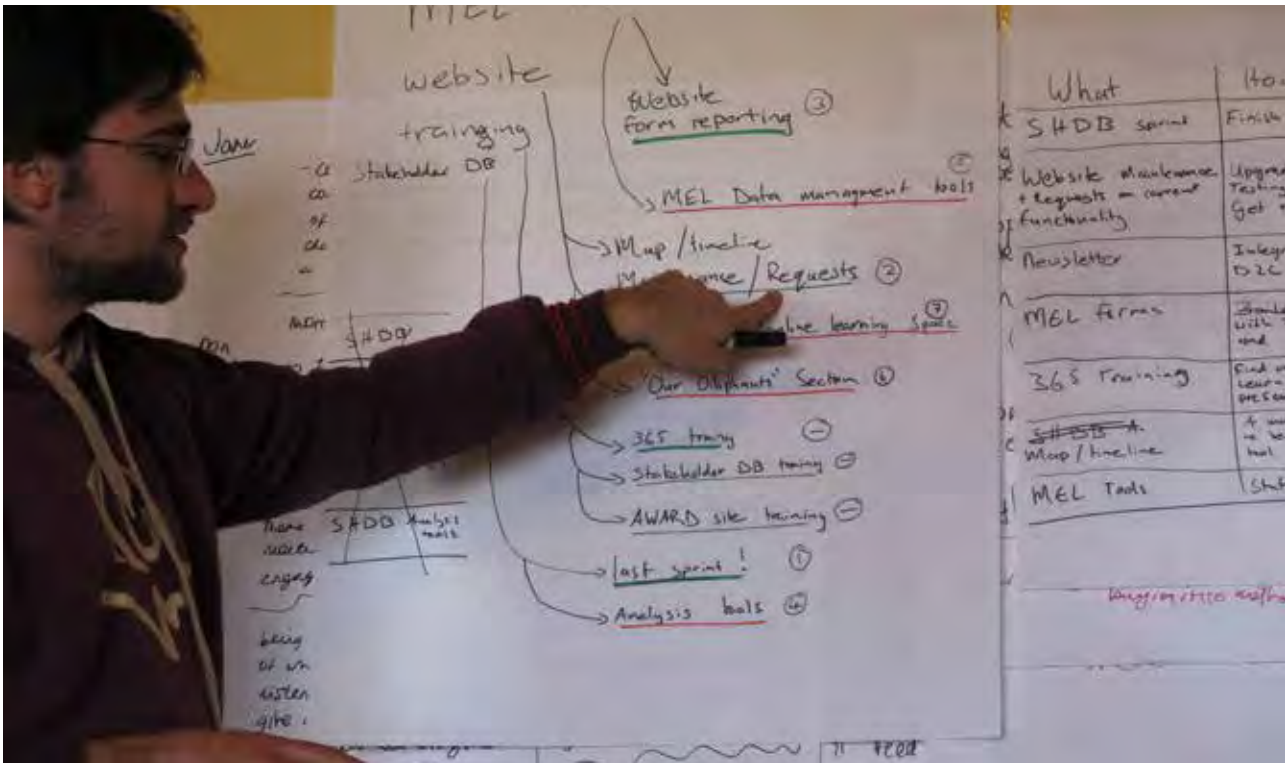
UNDERSTANDING AND TRACKING STAKEHOLDER ENGAGEMENT AND NETWORKS

Central to the work of USAID: RESILIM O is developing the capacity of individuals and organizations to respond to the challenges of climate change. This is also one of the high-level outcomes of the project. Our approach is to develop this through social learning and by building a resilience-learning network. A strong network is more likely to be able to respond appropriately to threats and risks, and work cooperatively. A strong network, however, does not necessarily lead to resilience. What we have encountered (see insights in Section Three) is that there are strong networks in the Olifants catchment, but these can be exclusive and driven by specific interests. This self-interest, if profit-motivated, can result in escalated resource exploitation and degradation, with a resultant increase in vulnerability – not resilience. One way to learn more about patterns in stakeholder engagement and networking is to track stakeholder engagement over time. To do this, we have made an effort to develop a flexible stakeholder database with the capability to track trends in stakeholder engagement and decision-making.

OLIFANTS CLUSTER MAP



The stakeholder **database**



Above:

Donavan-Ross Costaras, the program developer for AWARD, explaining the stakeholder database to staff in June 2014.

Currently, we have finished Phase One of the stakeholder database, which allows us to store and search information we have on stakeholders, disaggregated according to institutions, sector and cluster (these are currently the USAID: RESILIM O clusters). Additionally, we can track our engagement with stakeholders, and the type of engagement, such as interviews, workshops and meetings, according to sector, cluster and stakeholder group, as well as training and professional development events.

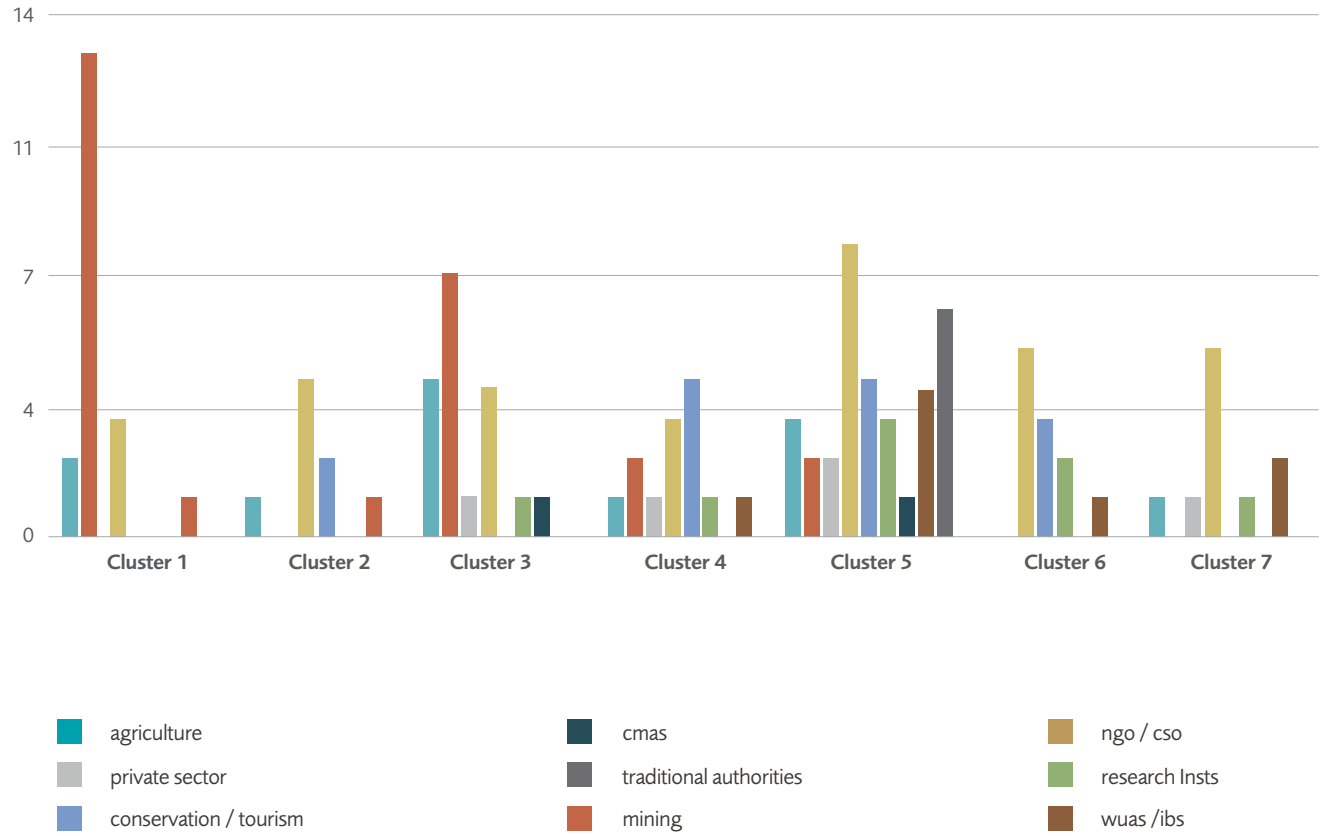
Phase Two, which is nearing completion, will give us the functionality to be able to track stakeholder groups, forums and networks over time. As is highlighted in the insights in Section Three, staff at USAID: RESILIM O have identified forums as key local institutions for building resilience in the catchment; and yet many forums, in particular, catchment forums, are non-functional in South Africa, and lack power due to their legislative status. Other forums, such as environmental forums, linked to district and local municipalities, are not seen as important by municipal structures. Some forums are sector-based. The stakeholder database will enable us to track these forums according to who attends meetings and the purpose of these meetings.

Below is a graph representing the stakeholders that we have recorded in our stakeholder database. This has been disaggregated into clusters and sectors. This representation will change over time as we continue to work in the different areas of the catchment. A quick glance at this graph shows the dominance of entries from the mining sector in cluster one, the area of Witbank and the Witbank Coal Fields, and mining companies such as Anglo Gold, Samancor and Xtrata. Sasol, too, is active

in this area. In cluster three, the mining sector again is dominant due to the platinum and chrome mining in the area, represented by key players along the Dwarsrivier, which lies between Steelpoort and Lydenburg.

Cluster five has a strong representation by traditional authorities, which represent the communal lands of Ba-Phalaborwa and Mametja, where traditional leadership and municipal governance exist side by side. It also shows that, currently, our database contains information on many of NGOs and CBOs in the catchment. This bias is created by the well-maintained NGO register. In Mozambique, (cluster six and seven) we see the prevalence of NGO representation.

A ROUGH CHART INDICATING SECTORS PROMINANCE IN THE DATABASE BY CLUSTER



Stakeholder profiles: **people of the catchment**

Although the project, ultimately, will work with the institutionalization of resilience practices, this needs to be done within the context of how stakeholders and civil society generally see and interact with the resource-base of the catchment. This is not a simple matter, given the complex nature of stakeholders in the catchment. Not only are we dealing with a trans-boundary catchment that comprises two countries with very different political histories, but we also have a highly diverse and divergent spectrum of institutions, industries, land-use practices, and cultural identities. This makes for a very challenging environment when it comes to developing a shared vision and collective action.

Fundamental to working together towards a common goal are the notions of identity and agency: How do people identify themselves, and are they in a position to work together given contextual realities? Based on the ability to self-organize and act collectively, resilient systems display high levels of responsivity. Self-organization is, in turn, a function of identity and agency – two important aspects that the project is profiling across the entire catchment.

STAKEHOLDER PROFILES: TWO EXAMPLES

The project is developing an expansive collection of stakeholder profiles that explore the nature of identity and agency in order to assist, at a later stage, with responsivity, self-organization, and agency (see the Quarterly Report April-June 2013, where we outline the methodology we are using for stakeholder profiling). Here are two examples of stakeholder profiles that show the vast differences experienced in the catchment. We understand that responsivity will be different in each of these cases – yet vulnerability and resilience both apply.

WATER SELLERS: STEELPOORT RIVER

The Steelpoort or Tubatse River flows northeastwards and is a tributary of the Olifants River, joining it at the lower end of its basin. Its source is located at Kwaggaskop, a farm between Dullstroom, Stoffberg and Belfast. Sekhukhuneland, historically home to the Pedi people, is located between the Steelpoort River and the Olifants River.

On a field trip to the area in September 2014, researchers from USAID: RESILIM O met three young men: Prince M, Kagiso M and Obrey T. They were collecting water under the road bridge crossing the Steelpoort River. Using 25-liter containers, they were decanting the water into larger drums, working with an older man who has a vehicle, and who transports the water to the settlements in and around Practiseer outside Burgersfort.

"We collect water from the river to sell for the purposes of building. We do not sell the water for drinking, as the water here has bad luck . . . it is dirty. The water is not usable because the sangomas (traditional healers) come here to wash people of their bad luck. You can see the coins in the water. This is because people throw them there to rid themselves of bad luck. No one will touch the money because if you do you will receive the bad luck yourself. Look: you will see the bones and the feathers from dead chickens that people sacrifice to rid themselves of bad luck. There are also many empty antiretroviral (ARV) containers in this area . . . We don't know why they have been thrown here.

"We collect the water here and sell it for R35 per drum to builders in Practiseer. This is not really a job. We can make up to R200 a day; other days we make nothing. Sometimes we each get R20 for the day's work. We would really like to get a proper job. Perhaps we can find something on the mines. Please can you help us find a job?"

FARMER AND GUESTHOUSE OWNER, GROBLERSDAL

Groblersdal is a farming town situated 32km north of the 178 million m^3 Loskop Dam in the Sekhukhune District of Limpopo. The town is South Africa's second-largest irrigation settlement. The main crops in this man-made floodplain are cotton, tobacco, citrus fruit, table grapes, maize, wheat, vegetables, sunflower seeds, peanuts, lucerne, and peaches. Groblersdal was laid out on the farm "Klipbank", taking advantage of the Loskop Dam, and named after the original owner, WJ Grobler.

On a field trip to the area, the team from USAID: RESILIM O met with Willem B. They discussed his farming experiences, as he has farmed in the area for nearly five decades:

"My father bought this farm in the 1960s after we moved here from Central Africa. We farmed there with cattle and maize. When we moved here, we looked for a place to settle. We looked at starting a business in the Free State, but then traveled around South Africa. The issue of rainfall makes farming in SA tough. We chose to settle near Groblersdal because of the irrigation scheme. We started here with wheat, cattle and veggies.

"The Loskop dam was constructed in 1938 and the canals were completed in 1940. Farms were allocated here by the government to war veterans as compensation, and to incentivize them to become farmers. Each got 25 hectares.

"When we moved here we had 25ha, but we steadily bought from neighbors who did not know how to farm and so left the area. We had 600ha with the mountainous part included and 120ha under irrigation, but now the farm is only 25ha. The remainder is leased out to neighboring farmers. Farming has become difficult and each farmer must produce more to be viable. So farmers rent land to increase production.

"We cannot make a profit from 25ha. I decided I was not going to borrow money from the bank to make farming viable so I now do other things and my wife runs a guesthouse.

"Water quality along the Olifants and the Moses Rivers are of immediate concern here. There is pollution from coalmines and the Middleburg and Witbank waste-water treatment works. The large citrus producers are deeply concerned about water quality. EUROGAP picks up toxic residues in fruit. Something needs to be done urgently. We have taken the water quality issues up to national government but nothing happens. There is no regulation at all. There are a lot of ways to prevent damage to the system. But this is too late. Repairing the damage is going to be very costly now."

These two examples – the workers collecting water, and the farmer – show how people give meaning to their lives and their environment. This is always in relation to identity and cultural context. The story of the young men collecting water from the river reflects vulnerability in terms of access to water, but also socio-economical vulnerability. Their story also highlights how they make meaning of "a dirty river". These three men, who represent part of a community, can do very little on their own to stop the pollution from mines and agriculture – their agency. Working with agency-building is therefore and important aspect of RESILIM O.

The farmer's story also highlights how he has had to adapt his lifestyle and practices to respond to his context. His way of regaining agency is to shift from farming to owning a guesthouse, and renting out the farmland to other farmers. He also expresses his lack of agency when it comes to addressing what he sees as a priority: the water quality issues of the river. He understands there are ways in which the problem can be addressed, but the institutional channels for addressing these problems are not working.

Both these stories help the project to understand how problems are perceived, and where agency is lacking, but also where stakeholders are trying to find agency. We get a better understanding of how vulnerable people are – both the young men and the farmer are vulnerable in different ways, and they articulate a vulnerability in our governmental structures and institutions to respond to their needs. They are both trying to adapt to their circumstances. If we are to help build the resilience of both the catchment and the people in the catchment, we will need to understand the practices they are engaged in currently and how we can change these practices to be more resilient.

STRATEGIC PARTNERS

Those institutions and organizations that participate directly in the collaborative development of resilience plans and practices are seen as strategic partners to the USAID: RESILIM O project. Less directly involved partners, that enhance the study through collaborative learning, dialogue and examples, are known as project partners. Here is a list of the strategic partners we have engaged during Phase One so far:

Ara Sul (Mozambique): This is the river basin authority responsible for part of the Olifants catchment in Mozambique. The project is linking with Ara Sul in Mozambique in order to access information and engage with practitioners and stakeholders. This is necessary to institutionalize practices that build resilience.

Olifants Letaba Catchment Management Agency (OLCMA) (South Africa): Although not yet established USAID: RESILIM O is a member of the steering committee advising the Minister on the establishment options. The OLCMA is critical for resilience building, as it is an institution that takes a systemic position. It is also central for the institutionalization of systemic practices. Planning instruments such as the Catchment Management Strategies (CMF), water quality standard-setting, and water quality monitoring plans are important for resilience building.

Inkomati Usutu Catchment Management Agency (IUCMA): The IUCMA provides an opportunity to share learning with the emerging OLCMA. RESILIM O team members are assisting the IUCMA with the development of an Integrated WQ Management Framework.

Department of Environmental Affairs (DEA): (RSA), national (Pretoria) and regional office (Mpumalanga and Limpopo Provinces): Collaborating with national, regional, and local partners to inform the Natural Resource Management and Environmental Protected and Infrastructure Program with regards to the "Working for ... " suite of programs, land-use incentives, adaptive management and frameworks.

Department of Water Affairs and Sanitation (DWS) (RSA): USAID: RESILIM O is working with the National DWS in the development of an Integrated WQ Management Framework. It is working through the Water Research Commission in the review of Integrated Water Resources Management (IWRM) policies that will influence the amendment to the National Water Act, and it is working as the task team manager on the revitalization of Catchment Management Forums (CMF) in order to develop a legal framework for the functioning of CMFs, as a well as a guideline for the establishment of CMFs.

OLLI (Olifants Levuvhu, Letaba, Inkomati) Technical Operations Committee: USAID: RESILIM O is a member of the multi-sectoral river operations committee that oversees day-to-day operations of the Olifants River. USAID: RESILIM O is a member of the committee, and hosted one of the quarterly meetings in 2014.

K2C - Man and Biosphere (MaB): RESILIM O is an advisory and strategic partner on the K2C MaB forum, providing conceptual guidance, informing institutional arrangements, and participating in the implementation of bioregional programs (towards improved PA and natural resource management, improved livelihoods, and strengthening institutional arrangements), such as the GEF PA, GEF SGP, DEA Wildlife Economy, and participating in forums like the K2C Network Coordinating Unit, Lowveld Steering Committee and the Natural Resource Management Forum.

South African Biodiversity Institute (SANBI) (RSA): The project engages with SANBI around strategic and technical components relevant to Protected Areas, Stewardship, Biodiversity, and land-use management, and participates in a platform to influence practices (mines and agriculture sectors, etc). This engagement provides an opportunity to inform land-use planning – zoning, risks, co-operative governance through partnering with the GEF Mainstreaming Program.

Greater Limpopo Transfrontier Area (GLTFA) (Mozambique and RSA): This engagement provides an opportunity to institutionalize practices around protected area management, international responses developed, buffer zones implementation, testing practices and governance, social learning and networking, and dialogue on regional reform.

Mpumalanga Tourism and Parks Authority (MTPA): Protected areas management and stewardship practices, with a special focus on resilience building, will be developed collaboratively with the MTPA.

Limpopo Department of Economic Development Environment and Tourism (LEDET): Protected areas management and stewardship practices with a special focus on resilience building will be developed collaboratively with the LEDET.

SANParks: Collaborative development of protected areas management and stewardship practices with a special focus on resilience building. RESILIM O will assist in the implementation of the National Buffer Zone Strategy as a Steering Committee member of the Lowveld PA steering Committee.

District and local municipalities: There are 10 district municipalities within the Olifants catchment boundary in South Africa and 13 in Mozambique. USAID: RESILIM O is a member of the Greater Sekhukhune Environmental Forum, and is seeking to expand membership to all district forums in the next year. These forums present the USAID: RESILIM O with an opportunity to assist municipalities in developing much greater capacity to establish and maintain environmental policies and projects.

Maruleng Local Municipality: RESILIM O is using this municipality as a local case study for informing improved environmental planning within the spatial development plans, and informing municipal processes such as Local Economic Development and Integrated Development Plans, towards integrated land-use management.

Loweld Protected Area Forum: RESILIM O is a Steering Committee of this forum, which informs improved protected area management within a land-use mosaic (reserves to catchment level); benefits derived from these; and forming learning networks with other regions. This forum is responsible for the coordination of the GEF PA and other PA initiatives.

K2C NRMP Forum: RESILIM O is a member of the multi-institutional forum, which is informing the "Working for" suite programs, learning between partners, adaptive management practices, and resilience panning. Partners include MTPA, LEDET, Mpumalanga and Limpopo WfW, SANParks, Working for Wetlands, SANBI, DAFF, and Working on Fire.

Greater Tubatse Environmental Forum-GTEF (Mining Sector): USAID: RESILIM O is a member of the GTEF, convened by the mines in the Steelpoort and Burgersfort area. RESILIM participates in meetings and advises the committee members on matters related to environmental projects and sustainability matters. This role is one of integration, mainly of water quality management and compliance.

Context **matters**

> *in complex socio-ecological systems there are likely to be a variety of interpretations of context, influenced by cultural means of production, science being just one.*

The situation in which a project is implemented is called its context. If a project and its partners are to respond by adapting to change it is important to have a good understanding of that context. However, in complex socio-ecological systems there are likely to be a variety of interpretations of context, influenced by cultural means of production, science being just one. Recognizing this, the USAID: RESILIM O project has developed a method that seeks to understand context by paying attention to the social dynamics which influence how people understand themselves in relation to the catchment, and vice versa. We call this "confronting context", and is the first step in the social-learning process. The subsequent steps are aimed at understanding how the contextual factors came to be, and then collectively acting to change or transform the context into a more sustainable or resilient situation.

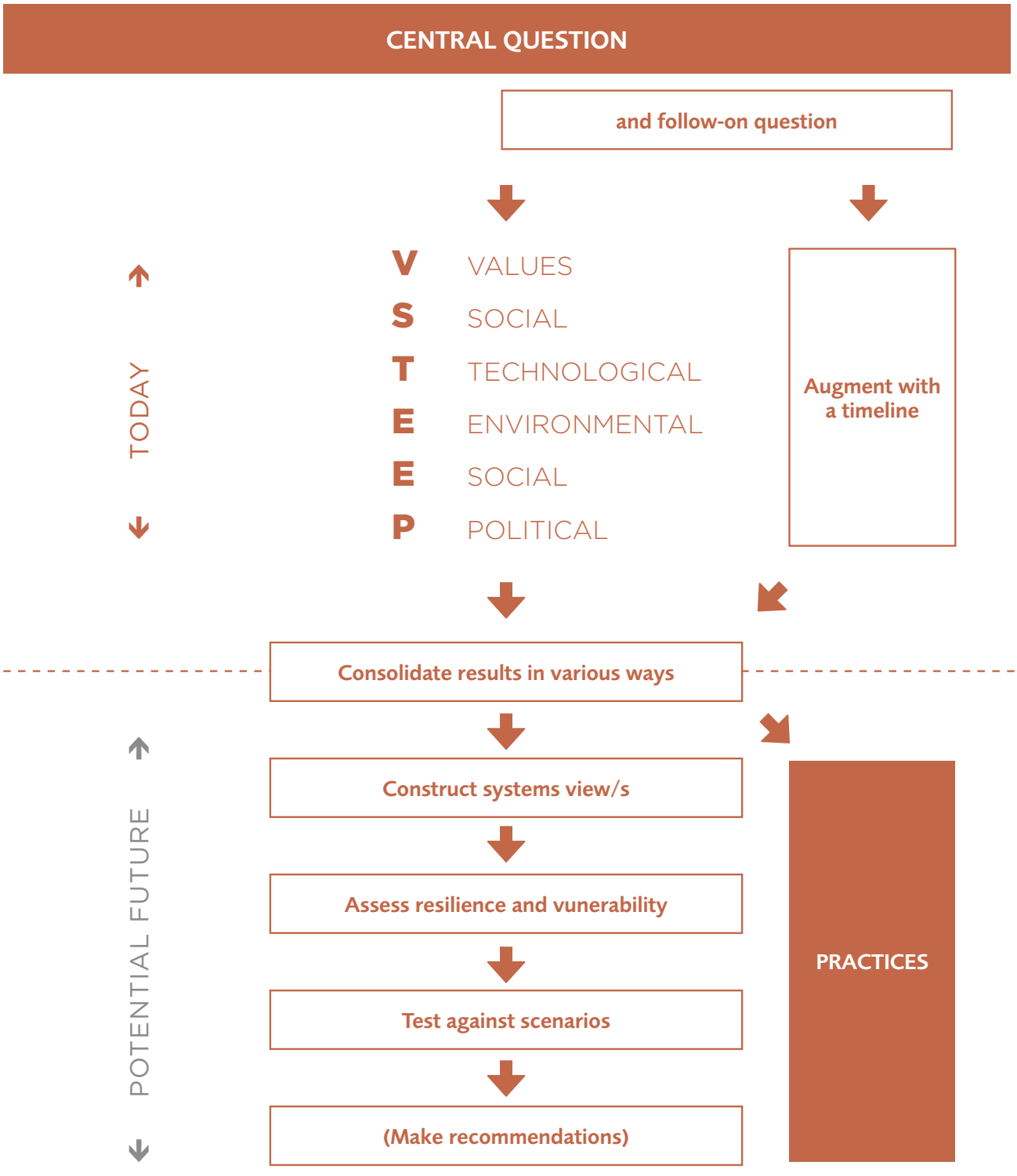
The approach we have adopted is to involve stakeholders in the development of a series of "contextual profiles" that draws on the cultural and institutional meanings of a particular part of the catchment. The approach uses the mechanism of VSTEEP. It stands for "Values: Social, Technical, Ecological, Economic, and Political", and represents an entry point for getting stakeholders to start talking about their catchment in a way where there are points of commonality. The aim of the project is to share the profiles as broadly as possible, and consider where there are points of divergence and potential conflict, as it is assumed there are areas where collective action towards resilience will be hampered.

HOW A CONTEXTUAL PROFILE USING "VSTEEP" WORKS

VSTEEP is not a process carried out by researchers; rather, it involves stakeholders living and working in an area. They have the opportunity to think about their context in new ways; hear what other people in the area think; and potentially broaden their view of their context. The VSTEEP process, therefore, must be anchored in a particular situation with which the participants are familiar. The process is guided by a central question that helps the project maintain a particular long-term focus: in our case, resilience of the Olifants catchment.

Our guiding question for VSTEEP has been: "As informed by our various views, how is the state of natural resources changing in the Olifants basin, with special reference to this part of the basin?"

This diagram represents the full VSTEEP process. Over the last few months USAID: RESILIM O has been focused on the first part of the process, labeled "today" in the diagram.



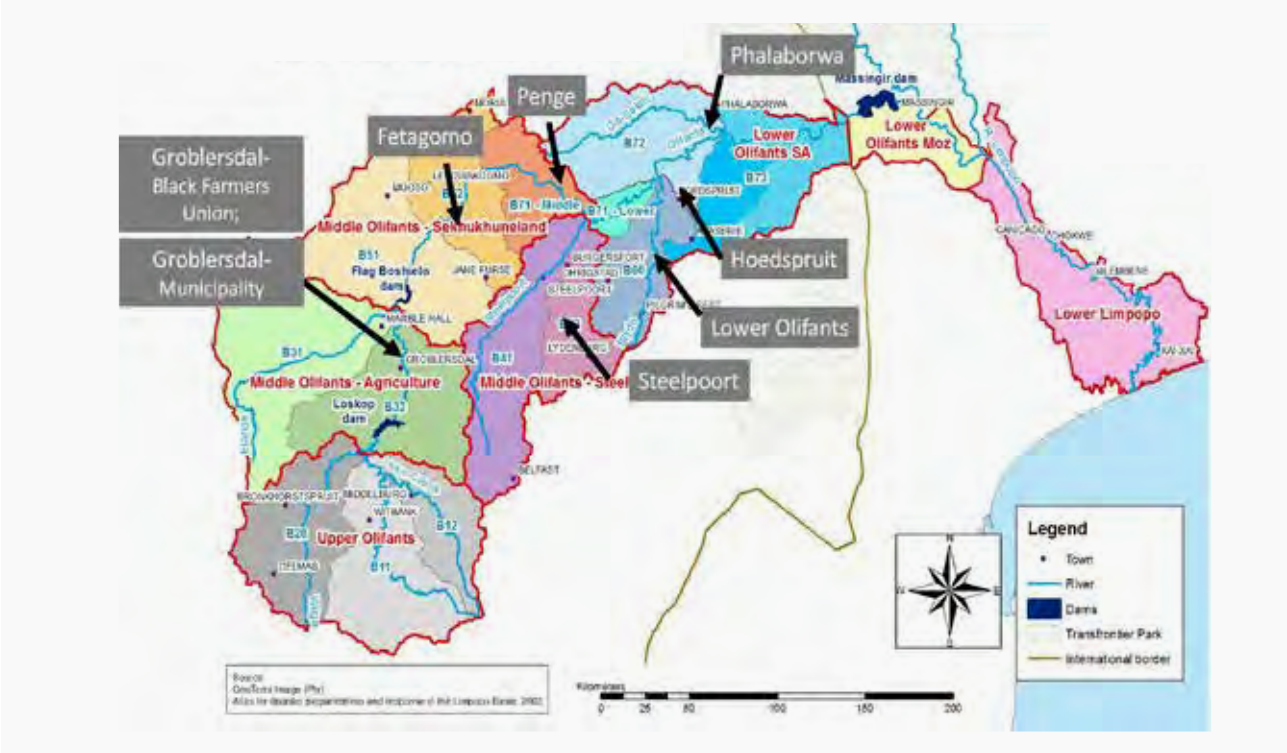
VSTEEP HELPS BUILD RESILIENCE

A key outcome of USAID: RESILIM O is to equip people in the Olifants catchment to be able to deal with the impact of climate change on their livelihoods and ecosystems. To do this, we need to build up a systemic understanding of threats and vulnerabilities. Dr Charles Chikunda, USAID: RESILIM O's stakeholder engagement facilitator and activity systems researcher, AWARD's director, Dr Sharon Pollard, and Dr Harry Biggs, AWARD research associate, explain the approach, its results, and what these mean for resilience in this section:

"The initial step in social learning is always: 'understanding context'. By using VSTEEP as a way to understand context in all its complexity, we have stakeholders describing their situations from their own perspectives," says Chikunda. "It's not an 'extractive tool', but rather a way of building up multi-dimensional, systemic pictures of the catchment in order to inform a thorough resilience assessment. In the process, we are refining the methodology to deal with the complexities, spatial and social, of the catchment," explains Chikunda.

AWARD researchers working on USAID: RESILIM O have now run 10 contextual profiling processes using VTEEP at various strategic points throughout the Olifants catchment.

This map shows the seven clusters of the USAID:RESILIM O project. The contextual profiling process in collaboration with stakeholders will be completed by the end of Phase One. VSTEEP processes have been completed in all but cluster one and Mozambique.



Dr Harry Biggs

Dr Harry Biggs is one of South Africa's leading thinkers when it comes to strategic adaptive management and systems thinking. He has worked with a wide range of biophysical scientists, both aquatic and terrestrial, in the Kruger National Park and surroundings, over the course of several decades. He is currently an AWARD research associate.

Early in his career, he took a special interest in spatial analysis and generalized linear modeling as technical tools and in river research and catchment management, and was the program manager in systems ecology research in the Kruger National Park.

Biggs is fascinated by the variation in socio-ecological systems, especially how this variation affects paradigms under which researchers and managers operate, and how practical mental models of resource managers have to be revamped to embrace complexity and notions of thresholds and resilience.

He is the author or co-author of over 80 scientific publications and presentations, many interdisciplinary, and is active particularly as an agent of change in setting up new initiatives or shifting mind-sets.

His interests in sustainability issues and their meaning for biodiversity, with a special focus on freshwater ecosystems and on systemic and adaptive thinking in conservation governance, have made him an ideal partner to work with on USAID: RESILIM O.

UNDERSTANDING AND TRACKING STAKEHOLDER ENGAGEMENT AND NETWORKS

In the last quarter, the team has expanded from multi-sectoral meetings – such as the ones run in Hoedspruit and Phalaborwa earlier in 2014 – to include single-sector and smaller group contextual profiling processes. "This strategic decision was due largely to the power gradients emerging from stakeholder participation in such meetings. We realized we need to make people comfortable enough to speak freely; in larger meetings we noticed that often the most vulnerable people didn't feel confident enough to talk out, and that this would skew the picture we were able to get of the system. This is just one of the challenges of building a democratic basis for governing a catchment," explained Charles Chikunda.

Chikunda and his team, consisting of staff members and interns, have decided on priority profiling areas. "We concentrated most on areas of strategic importance, but have also followed up on areas that are considered 'left out'," adds Chikunda. What the process makes explicit is that everyone living in the Olifants catchment occupies the same landscape mosaic, and is affected by the same threats, albeit in different ways.

"There may be more exploitation of resources in one place, and more conservation practices in another. By taking a systemic view of the catchment, and constructing systems diagrams, we can begin to see how, for example, cross-subsidizing the land-use benefits through some kind of consensus or agreement can confer resilience and sustainability, in various scenarios, including various climate change scenarios," says AWARD research associate, Harry Biggs.

We have now worked with over 200 people, representing 59 institutions, during the V-STEEP process..

Right:

Dr Harry Biggs facilitates a discussion on resilience in the catchment.

An emerging **systemic picture of the catchment**

Next Page:

Community members from Penge attend a contextual profiling meeting.

Now that the VSTEEP methodology has been applied across most of the Olifants catchment, "we can use the outcomes of these processes to create diagrammatic representations of how people see their worlds working," explains AWARD Director Dr Sharon Pollard.

The researchers either co-constructed these diagrams with people at profiling meetings, or are taking them back to the people who were part of the process to discuss connections and inferred causal relationships with them.

"We also ask people what they think are the solutions to problems they identify. In this way, we encourage people to think systemically. We also begin to see where the vulnerabilities and tensions lie," explains Pollard.

As such, AWARD is able to look at various scenarios affected by drivers like climate change, and to better understand how the system will respond, for instance; how resilient it is – or is not.

SOME RESULTS FROM THE PROFILING PROCESS

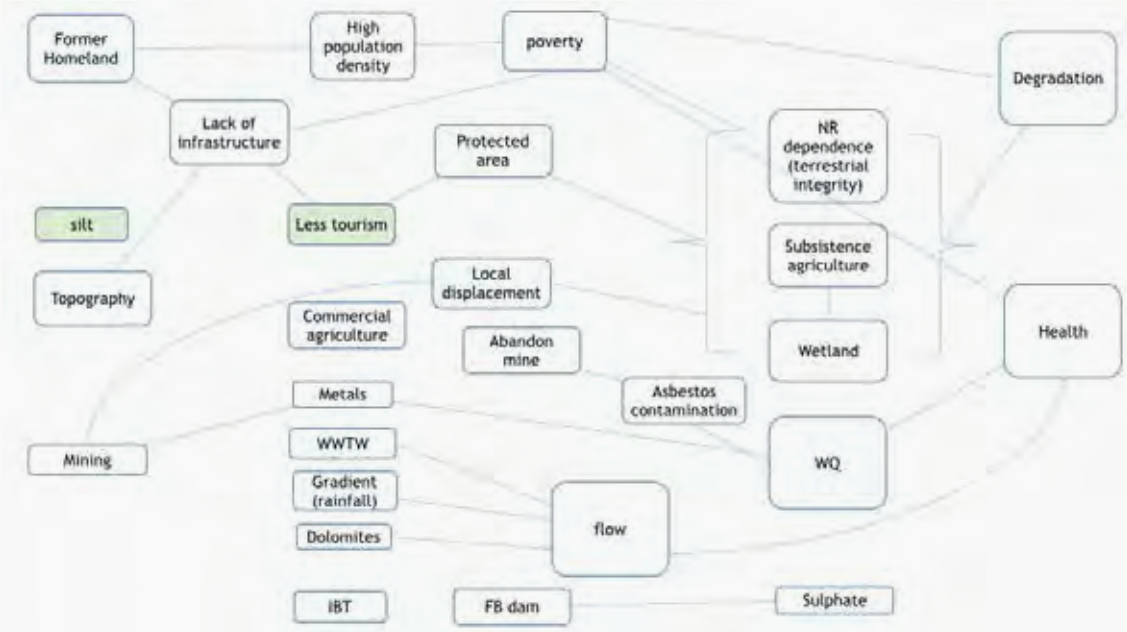
PENGE: A COMMUNITY-BASED PROFILE

Penge is a town in Sekhukhune District Municipality in the Limpopo Province of South Africa. It is situated along the Olifants River, 37km north of Burgersfort. It was established after amosite was discovered there in 1907.

The Penge profile, which was facilitated in two parallel sessions, is an example of a community-focused process that draws in the voices of people who are not necessarily represented in formal structures.

The full report is available on request.

PENGE CAUSAL LOOP DIAGRAM



> *We can use the outcomes of these processes to create diagrammatic representations of how people see their worlds working.*

Sharon Pollard
Director

Next page:
Clockwise from top left

1. *Community members point out where they collect water for domestic consumption.*
2. *RESILIM O staff visit a community project.*
3. *Pollution at water source*
4. *Contextual profile meeting in Groblersdal.*
5. *A systems representation of the Groblersdal contextual profile.*
6. *Community grape growing project.*
7. *Irrigation canals for commercial food production.*

PHALABORWA: MULTI-SECTORIAL PROFILE

Phalaborwa is a town situated in the Mopani District Municipality, Limpopo Province, South Africa. It is located near the confluence of the Ga-Selati River and the Olifants, halfway up the eastern border of the Kruger National Park in the Lowveld.

The workshop that took place in Phalaborwa was an example of a multi-sectorial gathering to create a profile for the area. Representatives from government departments (LEDET, DEA, DWA, and Ba-Phalaborwa municipality); agriculture; private sectors (mining, game reserves); parastatals (Kruger National Parks); academia; and NGOs attended.

The full report is available on request.

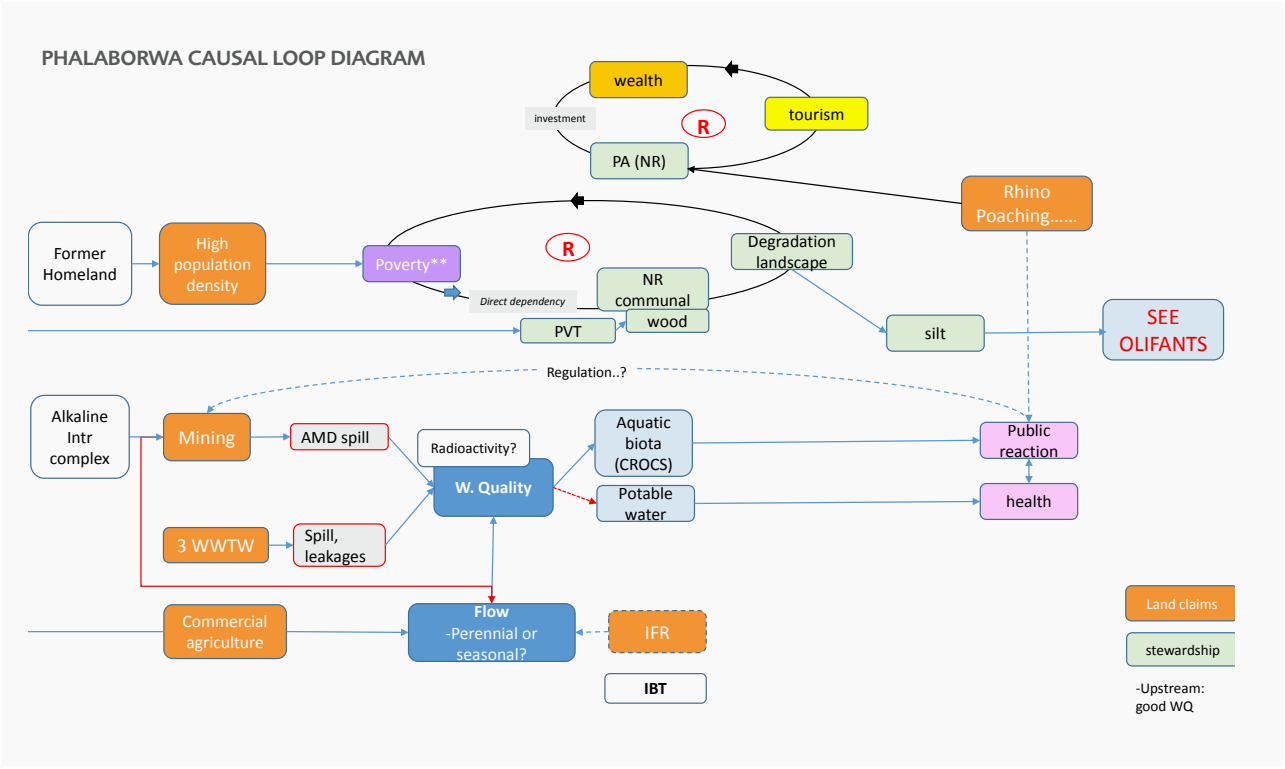
GROBLERSDAL: SECTORIAL PROFILE

Groblersdal is a farming town situated 32km north of the 178 million m Loskop Dam in the Sekhukhune District of Limpopo. The town is South Africa's second largest irrigation settlement.

The meeting that took place in Groblersdal was an example of a profile involving stakeholders from a specific sector, in this case, the emerging farmers who are members of the Lepelle Farmers Union.

They regard themselves as subsistence emerging farmers on communal land. Their biggest problems are access to land and water.

The full report is available on request.




1


2


7

> *"Values can tip the balance when there are changes from one state to another within a system, so looking carefully at them helps us understand what's going on in a multi-dimensional way."*
>
> ***Harry Biggs***


3


4


6

5

Contextual profiles in a nutshell

We use VSTEEP as a basis for building contextual profiles. It has a history of successful usage in Strategic Adaptive Management and was used for a decade and a half by AWARD, SANParks and others, particularly in the Lowveld area. In a nutshell, it encourages a group of people from different constituencies to be able to collaboratively build a holistic, largely shared picture of the context they are dealing with. This can act as a launch-pad for further joint action. It differs from many conventional approaches in that it takes longer but produces far wider and deeper buy-in, with scientific and other forms of knowledge being used together in a structured, robust and defensible way.

WHAT A SYSTEMIC PICTURE OF THE OLIFANTS CATCHMENT MEANS FOR USAID: RESILIM O

Taken together, the various profiles help co-construct a picture that reveals a growing view of the Olifants catchment, exposing key drivers and links that may otherwise have remained hidden. As it feeds into the USAID: RESILIM O resilience assessment, this work gives a systemic understanding of threats and vulnerabilities facing people and ecosystems, particularly in relation to drivers like climate change. This will inform the most appropriate suite of responses from USAID: RESILIM O in subsequent phases.

PLANNING FOR CHANGE: A SHORT HISTORY OF CONTEXTUAL PROFILING USING VSTEEP

"Strategic Adaptive Management means creating purposeful but flexible strategies to navigate changing circumstances, in a thoughtful way, by considering them in their complexity," says Harry Biggs. There is no dispute that the circumstances in the Olifants catchment are changing; the leading question is: "How?".

VSTEEP evolved out of the context of Strategic Adaptive Management as a way to answer this kind of question, by allowing people to think across a broad spectrum of drivers of change. "It doesn't matter if you classify a driver as ecological or technical; what matters is that you're thinking broadly and noting the many influences at work in an area," says Biggs.

The power of the approach lies in the fact that this operational heuristic brings people with various profiles, backgrounds, and interests together, and enables them to start thinking about their context, while at the same time revealing its complexity, to themselves and others.

By building up a systemic view of the Olifants catchment, as well as the results of contextual profiling and the various work-packages that have been sub-contracted out, USAID: RESILIM O is able to build a resilience assessment that sees all perspectives within the Olifants catchment as valid, even starkly contrasting ones.

WHY VALUES MATTER

"What makes VSTEEP special is that it pays attention to values," says Biggs. "Values ultimately frame the way you see the world and inform mind sets that drive behaviors and practices."

While traditional "scientific" research approaches often try to exercise values and focus on "facts", VSTEEP holds values at its core. "Values can tip the balance when there are changes from one state to another within a system, so looking carefully at them helps us understand what's going on in a multi-dimensional way," says Biggs.

Biggs stresses that the picture of an area, developed through VSTEEP, must make sense, not just parts of it. "That's why you have to do a lot of talking to lots of different people within different sectors and communities. The major currencies you have to use to do this are values."

Interests are WHAT people want from a process; values are WHY they want it. Often people express their interests but hide their values. Values, however, often drive interests.

"Once you know values and interests, you can then co-construct a model of a multi-use landscape that is sustainable and resilient, because it's the only model that says that, so long as sub-systems are interacting, and there are feedback loops and responses – mediated through the social-learning process – the system will adjust itself on an ongoing basis. This is crucial for resilience to climate change and other threats to both livelihoods and ecosystems," says Biggs.

He notes that practices that happen to prevent this "self-adjustment" are impacted by certain dominant values, to the exclusion of others, which is why they are so important (for instance, consumerism), and that makes adaptation difficult, leading to lower levels of resilience.

One hypothesis is that the world is in trouble precisely because certain values dominate and we do not do enough to understand the system, or enough interacting, responding and adjusting, suggests Biggs. He believes that the real value of processes like VSTEEP lie in their ability to get people to "agree deeply enough to start changing how they do and see things because they have come to some kind of fundamental realization."

"Quick results will never be sustainable because we're talking about people changing themselves and how they see their world and then how they act in it," Biggs notes.

He adds that an abiding concern within this research approach is why change sometimes does not progress beyond the funding cycle. "You can't underestimate the enormous time and energy that go into the process of creating a shared and systemic understanding of the Olifants catchment. You need the talking and the ongoing engagement to achieve the levels of trust required for real, lasting change."

UNDERSTANDING CONTEXT AND HOW WE CAN BETTER MANAGE CLIMATE CHANGE

The profiling process helps us understand points of leverage, or points of vulnerability in relation to climate change and other drivers in a systemic way. In building the resilience assessment, we will use this approach to understanding context alongside the outcomes of research-based work packages.

Understanding context is vital when looking at building resilience to drivers of change, such as climate change, as each context potentially can be affected very differently. The best way to understand context systemically is to work closely with stakeholders so that we can understand collectively different parts of the system, as well as help people respond appropriately if the system undergoes predictable or unpredictable changes.

This activity will be reflected in one of the program's significant deliverables: a comprehensive resilience assessment of the catchment.

More about context: using specialist studies to **understand specific aspects of the Olifants catchment**

In addition to the contextual profiling process described in the previous sections, the USAID: RESILIM O project has commissioned a series of specialist studies from a number of specialist institutes and consultancies that have the skills and competences to analyze and synthesize decades of research linked to the Limpopo basin and the Olifants catchment. Over the past year, USAID: RESILIM O has been coordinating a group of specialists. This group is known as Team Leaders and they convene twice a year to discuss methods, findings, and means of integrating research towards building resilience. In the section below we summarize these studies (called work packages) and present a full progress report on each in the appendix to section three.

POLITICAL ECONOMY OF WATER AND BIODIVERSITY

The aim of this study or work package is to understand how institutions have developed and are developing in the different socio-economic and environmental settings in the basin, within the context of increasing scarcity of natural resources (water and biodiversity). In order to institutionalize resilience practices and the capacity to adapt to climate change, it is vital to understand key water and biodiversity institutions and how these institutions function. The institutional arrangements in Mozambique have been described under this work package. This will guide the project's relationship-building with Ara-Sul in relation to its management units and committees.

GOVERNANCE AND OVERSIGHT

The aim of this work package is to understand better the consequences of different governance/ institutional arrangements (for instance. dealing with misfits, non-alignment), in order to deliberate with these institutions as to what can promote resilience. This work is in progress.

LIVELIHOODS AND VULNERABILITY

This study aims to understand livelihood dependencies on water and biodiversity, and the impacts of change, and to consider how institutional arrangements may incorporate resilience thinking and planning that address these dependencies. This is vital for incorporating the needs of communities relying on the basin for their livelihoods. To date, four typologies have been developed, indicating different levels of direct dependency on natural resources, allowing an examination of the potential vulnerability of different livelihoods to climate-change impacts on water and biodiversity. This work feeds into the systemic, participatory understanding of the catchment as an SES (with a focus on the inter-linkages between ecosystem services, livelihoods and drivers of change (which includes climate change).

SPATIAL ASSESSMENTS

The spatial assessments study seeks to integrate biodiversity, water resource management, climate change and socio-economic issues into spatial planning, in a systemic way (to reflect well-being and improved livelihoods and resilience). Central to this is the development of a set of spatial indicators (quantitative and qualitative) to monitor the current state of the catchment, and the impact of current and changed practices.

This work will include: spatial overview of important critical biodiversity areas, and integrated biodiversity conservation areas, land cover changes; climate change hot spots; a spatial overview of mining activities; and an overview of river threat status. There will be a special collaborative focus on environmental layers developed for spatial development planning with Maruleng local municipality.

WATER BALANCE FOR THE OLIFANTS CATCHMENT

The aim of this study is to develop systemic understanding of the status of water resources (availability and demand), and the key drivers of change under different scenarios in the catchment. This material will be used to engage with stakeholder platforms in order to support the incorporation of resilience plans into institutions and strategies. The following work is completed: a synthesis of the water resources situation within the Olifants River basin, and estimates of future water requirements and water balance, assuming no development or expansion of the water resource, in addition to a description (from a water resources perspective) of various proposed management and development options that will ensure a positive water balance into the future.

WATER QUALITY ASSESSMENT FOR THE OLIFANTS CATCHMENT

This study is finalizing a systemic and participatory understanding of water quality issues and practices in the basin. This work will be used in 2015 as an input to understanding the management of water quality as a contribution to the resilience of the Olifants catchment.

ECOLOGICAL WATER REQUIREMENTS

This study will increase understanding of social-ecological water requirements under different scenarios and drivers. It is also currently reviewing the DRIFT (Downstream Response to Imposed Flow Transformations) methodology. This ongoing work is busy with a scoping of how stakeholders experienced and understood classification, and, more specifically, the associated benefits of a particular class of the resource, and a collaborative understanding of water-related ecosystem services under different scenarios, including climate change (for instance, residents and stakeholders together with scientists).

PROTECTED AREA EXPANSION AND BIODIVERSITY STEWARDSHIP

The study is developing a better understanding of how protected area stewardship can contribute to human well-being (through improving land-use practices in order to improve resilience). USAID: RESILIM O, as key partner and support to the Lowveld Steering Committee, we will be able to meet and possibly exceed the target in the Global Environment Facility Protected Areas (GEF PA) Program by facilitating an additional 60 000 hectares to be classified as protected areas within the catchment.

PROTECTED AREA MANAGEMENT EFFECTIVENESS

The work package comprises a suite of activities that aim to understand and develop appropriate evaluative processes for improved protected area and stewardship management at reserve and catchment level. A first draft of the status quo of the protected area network has been developed with the Maruleng Local Municipality. There is work on a beneficiation framework with regard to the Wildlife Economy in collaboration with various partners and programs (RESILIM B, SANParks, GEF SGP partners, K2C, etc). Additionally, there is an overview of current management effectiveness by different protected area stakeholders, and a process to inform this better, and finally work will be completed on a classification framework for determining the legal status quo of protected area networks. This evaluates classification mismatches from local to national level, and informs the spatial data set at provincial and national level.

“Team leaders meetings are an opportunity to reflect on important issues and concepts, especially social learning.”

Internal **learning**

A COMMITMENT TO LEARNING

A commitment to learning is core to all USAID: RESILIM O work. Whether you are the director of the organization or an intern, there are continual opportunities for learning and reflection. This is in accordance with the overall approach to the USAID: RESILIM O project, in that it is social learning, and it is a response to the context of education in South Africa.

South Africa's educational system is in crisis. Many children never finish school and those who do often leave with a very low standard of education. Universities across South Africa have had to put a lot of money into support programs for students who arrive at university with very limited academic skills. Critical thinking, the ability to think systemically, and basic research skills are sorely lacking. Socio-economic factors such as poverty often also exclude a majority of South Africans from educational institutions.

Other factors include the closing down of technical colleges, and the inferior training of teachers. Derick du Toit and Jane Burt spoke to a metal seller at the side of the road in Sekhukhune Village, who confirmed that young people were unable to get jobs and had very little skills. He had been trained as a metal worker at a technical college, and with this skill had been able to make a decent income. "The youth now don't have that option and," he argued, "they can only sell brooms at the side of the road." This is not the only story AWARD staff hear about how difficult it is make a living with no or limited skills. This is a key driver in the Olifants catchment and reduces the resilience of people to adapt their livelihoods in times of scarcity. It also inhibits the ability of communities to mobilze against powerful stakeholders whose activities damage valuable ecosystem services that contribute to reducing vulnerability.

Team leaders

Team leaders meetings are opportunities for integration and learning.

Team leaders meetings provide opportunities for researchers from multiple disciplines to engage and learn.

"Team leaders meetings provide an opportunity to reflect on and internalize important issues and new concepts, particularly social learning, which we need to take into consideration no matter what."

"It is a very useful learning in a forum. It is much easier to learn from people in such a forum than to read about their work in papers or reports, especially when people know the context and content."

A COMPREHENSIVE INTERNSHIP PROGRAM

With this in mind, AWARD adopts values and principles that include supporting young, often previously excluded South Africans who want to develop skills and gain employment. One way in which this is done is through AWARD's internship program. Currently, AWARD has seven interns working on the RESILIM O project. Four of these interns are Groen Sebenza interns. Groen Sebenza, meaning Green (in Afrikaans) and Work (in isiZulu), brings together young South Africans from previously disadvantaged backgrounds, together with experienced biodiversity professionals, to learn, grow, and eventually gain the competence and confidence to embark on rewarding and meaningful biodiversity careers. The aim is to develop priority skills in the biodiversity sector and create sustainable job opportunities for unemployed graduates and matriculants.

The other five interns are funded through the USAID: RESILIM O project.

The mentoring of interns is both challenging and rewarding for AWARD staff, particularly when staff, too, are learning how to manage and implement the innovative USAID: RESILIM O project. As Sharon Pollard remarks, "It is a challenge that perhaps many other organizations don't face." Usually, organizations employ expert consultants, whereas at AWARD there is a principle of building the capacity of young South Africans to enhance the sector. And yet what better way to start your career as an agent of change than working on the USAID: RESILIM O project?

One way in which AWARD ensures continual reflection and learning through the USAID: RESILIM O project to ensure continual reflection and learning, is through USAID: RESILIM O monthly meetings. These meetings are designed as learning opportunities, as well as for planning and integrating the different themes. The first one of these meetings was run in May 2014. Interns have identified this meeting as one of the most significant learning experiences for them.

Shonisani hails from the mountainous area of Venda. She joined AWARD in 2014, and is part of the Groen Sebenza internship program. She attended her primary, secondary and tertiary education in Venda. Before she came to AWARD she was working as a research assistant at the Africa Institute of South Africa which is a research institute that focuses broadly on African affairs. She works on the natural resource management work package and the land-use incentive program under the guidance of Dr Marisa Coetzee and Jan Graf. She also assists Chris Williams' sub-contract on land-claim profiling. Below are her reflections on being an intern in the USAID: RESILIM O project:

"I think I have to mention this: When I first got to AWARD I felt somehow lost, as the project seemed very complex and I could not comprehend most of the concepts. But people kept saying that the whole project was a learning experience for everyone, and that seemed to ease things out for me. Going forward, I had that mindset that it is a learning process.

"Being part of the RESILIM O project has opened for me a whole new dimension on how to look at things differently. I felt privileged to be part of the development of the MEL methodology, even though at the time it was still fuzzy for me and I couldn't really grasp what it meant and how it would be applied. Nonetheless, with time, I got to understand the concepts and its applicability. Additionally, one thing that I will take with me going forward in my career is the aspect of the learning process that people seem to just overlook in the academic/ science fields.

"I also learned a lot about the whole systems

> *Being part of the RESILIM O project has opened for me a whole new dimension on how to look at things differently.*

Shonisani
Intern

Team leaders

Jane Burt asked two team leaders to reflect: "If the USAID: RESILIM O project was an animal, what would it be and why?"

Jordi: "Ha ha, this is a question for my daughter. It is not a predator like an eagle or a hawk. It is probably like an elephant or an ant. These are completely different animals. Elephants work together, going slowly, and they look at what is going on before finding a solution. Ants work together and have the same objective. The project is probably aiming to be both."

Alison: "I have a positive and a negative animal. The negative animal is amoeba. It is amorphous and all over the place. The positive animal is an aardvark. It is probing around, looking for bits that will all come together as a nice meal. It has an investigative nose."

> *"It is a very useful learning in a forum. It is much easier to learn from people in such a forum than to read about their work in papers or reports, especially when people know the context and content."*

thinking approach, which I find crucial in the environmental sector. It helps to think of the catchment as a system that is interlinked, and that what happens to one aspect is likely to affect another thing elsewhere (I felt very fortunate to learn this). Moreover, being part of the WatRes process and VSTEEP, which both play a vital role in the resilience analysis of the Olifants, was a great experience. For me, it helped give a reality picture about issues at the ground, as opposed to how high-level institutions or policies conceptualize issues on the ground. That was a great experience indeed."

Additionally, just within the biodiversity theme and sector itself, I have learned a lot and gained a lot of experience, which will help me grow in my career path going forward.

When asked what she would like to do after her internship at AWARD, Shonisani replied:

"I would like to find myself working in an organization similar to AWARD or any other one that strives to make a difference especially in the environmental sector. I am hoping to find myself employed in the area that I am currently focusing on (natural resource management programes), but mainly concentrating on ground level issues and how they inform high level decision making and policies within the NRMPs. I am also hoping to find a position that will allow me to interact more with communities and/or a range of stakeholders but most importantly those at ground level."

REFERENCE GROUP MEETINGS

"This is a time for senior staff to be creative together and think out of the box," Sharon Pollard says.

As mentioned in the note from the director, the Reference Group consists of two advisors, Prof Ray Ison and Dr Eureta Rosenberg. The reference group has met three times this year with theme leaders of the USAID: RESILIM O. It is a learning experience for all involved. This is where the deep thinking behind the project takes place. Below, Prof Ray Ison reflects on what the reference group means for him:

"The RESILIM Reference Group (RG) continues to play an important part in effecting systemic governance of the RESILIM O program. In undertaking its activities and modes of thinking and doing, the RG seeks to be congruent with actions at other levels within the program. In other words, the RG can be understood as part of a recursive structure that operates across different levels of governing and managing.

"Three key issues preoccupied the RG in its last meeting: (i) How people who are affected but not yet involved in the governance of the Olifants catchment (especially people from marginalized groups) may be approached and included in future RESILIM O activity; (ii) Reports on progress to date and issues of concern, including with USAID and; (iii) Framing the next stages of the AWARD approach to RESILIM O. A very helpful orientation meeting was held with some staff from RESILIM B.

"For me, three important framing questions emerged from the discussions under the rubric of: What is the trajectory towards resilience in the systemic governing of the Olifants?

"(i) What extant practices and enabling institutions for resilience are worthy of being conserved and at what systemic levels (e.g. national, regional, local)?

"(ii) What practices and institutions deserve to be stopped because they are disabling in moving on a resilience trajectory?

"(iii) What practices and institutional form(s) will AWARD wish to embody, hold, and enact by the time RESLIM O comes to an end?

"I had a practical suggestion for all presentations of RESILIM O material – that's where possible local levels be seen at the top of a slide or figure, for instance, the role of national, regional levels of government is to support the local.

"One item that came through powerfully for me was the very significant negative impact that disposable baby nappies were having within the 'river system'".

03
PROGRESS AND RESULTS

This section provides an overview of progress against the objectives and indicators of the USAID: RESILIM O project for the year (2014).

Monitoring, Evaluation and Learning (MEL): **About us**

This section measures general project progress towards reaching stated objectives and outcomes. Our evaluation model is a hybrid that combines indicator-based monitoring and evaluation with the collection and analysis of more open-ended narratives, within an overarching reflexive framework that corresponds to the program's "complex adaptive system" approach and its emphasis on social learning. The hybrid model has been designed to support learning and responsivity, to meet the shared needs of the program and its funder, USAID. Monitoring and evaluation is aimed at capturing (and, where necessary, correcting) program performance, but also learning, regarded as an important feedback loop into the system.

Firstly, we report against pre-defined targets in the form of indicators. The indicators originate from the overall Results Framework, which maps out the important expected outcomes of the program, against indicators that help us measure (and monitor) progress.

The quantitative data, however, only tells one side of the story – it can demonstrate that "something is happening", but it lacks the ability to shed light on matters of quality and nuances of learning. For this reason, we combine two types of data, quantitative and qualitative, to give a rich picture of the progress that has been made during the quarter.

Our complementary approach draws from qualitative data, consisting of "most significant change" stories and insights, which are "harvested" from staff through various processes, including field reports (using Back to Office (B2O) report templates); spot interviews and focus group reflections; and, in time, invitations for program participants to submit narratives on the website, social media and other forums.

Not only do these stories provide qualitative evidence for reporting purposes, but also act as a means for reflecting and learning.

This complementary approach, however, is a work in progress. AWARD staff have gone through two cycles of identifying and reflecting on significant change and insight stories. What staff are discovering is that a participatory developmental evaluation takes a lot more time than expected, and reflecting on the quality of work – rather than just identifying that something has happened – is a learning process in itself.

The significant change stories have informed the features for Section Two of this report, but for this Progress and Results section, we have decided to report on the specialists' work packages and their contribution to the overarching resilience assessment. Significant stories will be used to guide and inform the up-and-coming strategic planning meeting, where AWARD will be developing the next yearly work plan. This will be reported on in the next quarterly report. The narratives also provide qualitative evidence of the indicators.

We are still experimenting on combining indicator-based monitoring and evaluation with the open-ended narratives. This will be the core challenge and focus of the MEL process in the new year.

Section Three contains the following:

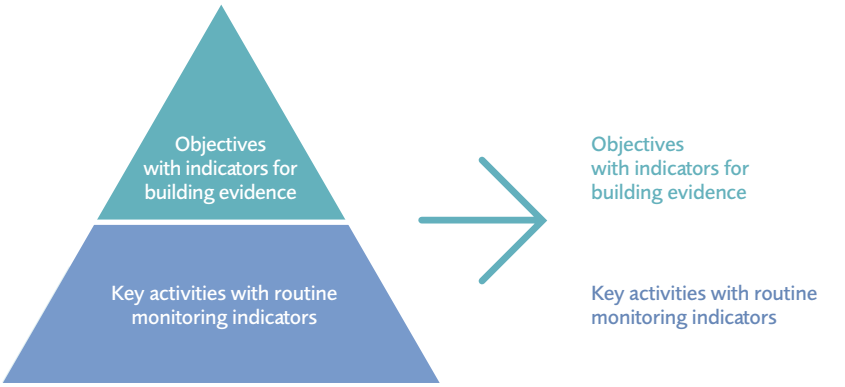
Quantitative reporting against pre-defined performance indicators, with some narrative descriptions to put the figures into perspective.

Overview of progress towards reaching outcomes: This serves to complement the quantitative targets to build evidence to demonstrate how the project is bringing about change.

Overview of key technical reports. These are largely studies commissioned to feed into the resilience assessment (Appendix to this section).

Introduction **to reporting against outcomes**

The next section contains the quantitative targets as set out in our Results Framework. During the annual report, we place emphasis on building of evidence towards our high-level indicators. These are depicted in the diagram in the green zone, and are reported on annually. We currently have five indicators towards which we are gathering evidence from the activity-based indicators (blue zone) that are reported on quarterly.



Number of **institutions** with increased capacity to adapt to the impacts of climate change as a result of USG assistance

Number of **individuals** with increased capacity to adapt to impacts of climate change

Number of **policies, laws, agreements or regulations** promoting sustainable natural resource management and conservation

Number of **hectares** under improved natural resource management / Nr of hectares of biological significance and/ or natural resources showing improved biophysical condition

Number of people receiving **training** in Natural Resource Management and/ or Biodiversity Conservation

SUMMARY OF EVIDENCE TO DATE:

Number of institutions with increased capacity to adapt to the impacts of climate change as a result of United States Government assistance

During this reporting period, the project worked with over 400 institutions, ranging from international, regional to local within and outside of the Olifants catchment. The orientation of the project is to build the capacity of institutions with the express purpose of building responsive and systemic natural resource management that recognizes the catchment as a system, and that is capacitated to deal with the unpredictability and complexity of the system. Central to this capacity is self-organization, integration, identity and agency. Work includes identifying the relevant institutions, introducing them to the project, inviting them to participate, assessing their mandates within the policy and legislative frameworks, and analyzing opportunities and challenges faced by such institutions. A further aim is to configure improved networking through enhancing communication between these institutions in general. Examples of institutions include LIMCOM; Department of Water and Sanitation; provincial government departments such as LEDET, MTPA, Irrigation Boards and Water User Associations; localized institutions like district municipalities, mines; commercial agricultural organizations; and a host of forums that function within the catchment.

Number of individuals with increased capacity to adapt to impacts of climate change as a result of United States Government assistance

The project has worked with over 1400 individuals to build their capacity to respond to a changing catchment and uncertainty in general. With time this will include climate change. The purpose is to introduce the individual to the language and practices associated with management towards a more resilient catchment, regardless of the institution in which they reside. The overall purpose is to build a shared discourse and has been conducted through a variety of meetings, workshops, networking events, as well as through social media and communications. Following from a social learning orientation the main means of initiating individual learning has been through the collective and individual profiling of the status quo of the catchment (see Section Two on collaborative catchment profiling). The stakeholder database and ongoing stakeholder profiling processes help us to understand and track the identity of stakeholders, as well as their spatial distribution within the catchment. The database is also an instrument that will assist in planning and tracking training, professional development, and mentoring.

There was also individual capacity developed by individuals through research and partner projects. This is discussed under Section Two of this report.

Number of policies, laws, agreements or regulations promoting sustainable natural resource management and conservation as a result of United States Government assistance

Beyond individuals and institutions, the project also aims to influence relevant policies, agreements and regulations. During this phase of the project, key regulatory instruments were identified, where interventions could have maximum impact towards building resilience. The project is preparing to leverage influence through national legislative amendments (the amended National Water Act); policy development (agreements between South Africa and Mozambique; legal frameworks for stakeholder platforms; guidelines for forum functioning; and local government planning instruments); and regulations (bylaws). Specifically, success has been achieved through implementation of protected area expansion, as well as support for the development of local and regional instruments such as bylaws and sector-specific conservation/ water management plans. These are long-term activities and will draw on support from sub-grants in 2015 in South Africa and Mozambique.

Number of hectares under improved natural resource management / number of hectares of biological significance/ and or natural resources showing improved biophysical condition as a result of United States Government assistance

The project also has a spatial focus area (in terms of **number of hectares** under improved natural resource management). The project is assisting government to develop the legal frameworks for implementing and capacitating forums that equate to the improved localized governance of specific areas of the catchment. In this reporting period, specific achievements relate to Protected Area Registration and Management through **spatial development plans** and frameworks (through local and district government), and the establishment of stakeholder platforms called Catchment Management Forums for managing specific sections of the Olifants catchment (particularly water and land use) on a decentralized basis.

The project works with specific institutions and policies that govern spatial areas under improved management (for instance, buffer zone in Kruger National Park; nature conservancies; locally specified priority areas; ecological reserves; and environmental water requirements for run-off river, etc). Through this process we will be able to meet and possibly exceed the target in the Global Environment Facility Protected Areas (GEF PA) Program by facilitating an **additional 60 000 hectares to be classified as protected areas** within the catchment.

Formal training of individuals is set to start in 2015 and therefore no results are reported in this regard.

In this remaining part of Section Three we highlight the status of progress against the results framework. The program will identify, in the coming work plan for 2015, priority areas (approximately four) for an integrated implementation of water management, protected area management, and biodiversity conservation.

Progress against quantitative indicators outlined in the **Results Framework**

The results framework provides a summative overview of key milestones reached, and progress made in the past year towards achieving the project outcomes. It outlines the project activities / processes / deliverables that ensure the outputs work together to bring about the transformation as articulated by the outcomes. Notes are included to explain the rationale behind the activities and outputs in relation to their outcomes.

THEME ONE

INTEGRATED SYSTEMS AND RESILIENCE ANALYSIS AND ENSURING PATHWAYS TO IMPACTS

OUTCOME	INDICATOR LINKED TO OUTCOME	BASELINE 31/03/14*		TARGET SEPT 14		ACTUAL JUNE 14*		ACTUAL SEPT 14		CUMULATIVE SEPT 14**	
Tenable multi-scaled climate risk adaptation strategies and practices developed and institutionalized through reflective and collaborative processes, to contribute to a resilient Olifants basin	Nr of individuals with increased capacity to adapt to impacts of climate change demonstrated as a result of USG assistance	M	F	M	F	M	F	M	F	M	F
		304	206	450	300	187	89	429	266	920	561
EXPLANATORY NOTES: This theme focuses on transformation of resilience planning and practice. It aims to understand the vulnerabilities or resilience of natural resources (water and biodiversity) to drivers of change (especially climate change). By understanding the Olifants River basin as a socio-ecological system or SES, the project is able to illuminate areas of vulnerability by tracking climate change through the system as a whole. The configuration of practices and governance systems can either confer or undermine resilience. By working through practices with stakeholders in the light of change and adaptation, the development of resilience practices are supported. During the next quarter we will review our capacity-building target numbers, since we have exceeded them by far. This is due to attendence of scoping and consultation meetings like VSTEEP that were much higher than initially anticipated, and we will adjust our planning accordingly (this goes for number of individuals and number of institutions).										

OUTCOME	INDICATOR LINKED TO OUTCOME	BASELINE 31/03/14*	TARGET SEPT 14	ACTUAL JUNE 14*	ACTUAL SEPT 14	CUMULATIVE SEPT 14**
Increased integration, collaboration and learning among project components, subcontracts, sub-grants, partners, stakeholders, including staff, within and across program activities	Nr of institutions with increased capacity to adapt to the impacts of climate change as a result of USG assistance	106	100	161	189	465
Increased dialogue, learning and collaborative planning taking place	Number of reports and communications reflecting deepening understanding and growing coherence and synergy within and across programe activities (increased reflexive and collaborative processes)	0	1	0	6	6
EXPLANATORY NOTES: Theme One plays an important role in co-ordinating the key research areas, and synthesizing and integrating the resilience assessment in a way that ensures coherency and co-learning (Objective Five). To do this, the Theme co-ordinates RESILIM O staff, as well as consultants involved in specific activities. Four internal meetings have taken place that are run through systemic and social learning processes. This year also had two team leaders meetings that synthesize the key themes emerging from the sub-contracts and work packages - this contributes to a participatory and systemic resilience analysis.						
Improved mechanisms for assessing resilience and vulnerability within the Olifants basin	Existence of Resilience Analysis Framework	0	1	1	0	1
EXPLANATORY NOTES: Assessments are informing the development of a systemic view of the ORB as a start to the resilience assessment. The work elucidates major practices to inform the work of Theme Four. In the last quarter the resilience framework has been tested based on feedback received during the V-STEEPs and one-on-one interviews.						
Trans-disciplinary systems hub established and functioning	Existence of systems hub promoting integration, synergy and coherence between all program objectives	0	1	1	0	1
EXPLANATORY NOTES: Trans-disciplinary systems hub comprising various themes and team leaders will be established and functioning to ensure continuous reflective and collaborative processes that promote integration, synergies and coherency between all programmatic objectives. The hub is comprised of AWARD staff and Team Leaders with a special interest in systems thinking.						
Improved understanding of relationship between Ecosystem Services and Livelihood and drivers of change	Report on relationship between Ecosystem Services and Livelihood and drivers of change	0	0	0	0	0
EXPLANATORY NOTES: An analysis of census data is completed and will be supported by field work. The first draft of this report is expected in Nov '14.						

* Baseline data and data for June has been updated/corrected since the previous report.

** Since beginning of project up to end of reporting period.

THEME ONE

INTEGRATED SYSTEMS AND RESILIENCE ANALYSIS AND ENSURING PATHWAYS TO IMPACTS

OUTCOME	INDICATOR LINKED TO OUTCOME	BASELINE 31/03/14*	TARGET SEPT 14	ACTUAL JUNE 14*	ACTUAL SEPT 14	CUMULATIVE SEPT 14**
Increased knowledge of Political Economy within the basin (informing Social Ecological Systems and resilience framework)	Report of synthesized Political Economy framework	0	0	0	0	0
EXPLANATORY NOTES: A grounding assessment is being produced that aims to increase knowledge of Political Economy within the basin (informing the socio-ecological system and resilience frameworks produced by Theme One). This work is supported by a subcontract. The report is expected in Oct '14.						
Increased knowledge of livelihood dependencies on water and biodiversity and impacts of change understood and institutionalized	Report of synthesized Livelihood Framework	0	0	0	0	0
EXPLANATORY NOTES: This assessment is increasing knowledge of livelihood dependencies on water and biodiversity, which highlights the impacts of environmental change on livelihoods (to be conducted with stakeholders). This work is supported by a subcontract. The initial team responsible for this research was re-structured and now includes AWARD, Stephen Holness (spatial analyst), and a senior researcher from PLAAS (University of Western Cape). The first draft report will be presented at the team leader meeting in Nov '14.						
Increased knowledge on interlinkages between water-related ecosystem services (incl. biodiversity) and human well-being, incorporated into resilience thinking and planning	Report of synthesized Ecosystem Services and Wellbeing-framework	0	0	0	0	0
EXPLANATORY NOTES: Another grounding assessment is increasing knowledge on interlinkages between water-related ecosystem services (incl. biodiversity) and human well-being, incorporated into resilience thinking and planning. This work is supported by a subcontract. A framework has been deveoped, and informs how drivers of change impact on livelihoods and well-being, as mediated by ecosystem service (since natural resources like water and biodiversity provide ecosystem services, which in turn affect livelihoods).						
Increased knowledge on potential impacts of Climate Change on resilience	Report of synthesized Climate Change, risks and threats framework	0	0	0	0	0
EXPLANATORY NOTES: This assessment is increasing knowledge of potential impacts of climate change on resilience. This work is be supported by a subcontract. A framework has been developed, and a report has been created on Climate Change. The staff member heading up this deliverable has resigned and AWARD is still in process of finding a replacement.						
Increased knowledge on risks and threats to resilience of water and biodiversity resources	Report of Resilience Analysis conceptual framework	0	0	0	0	0
EXPLANATORY NOTES: Report is in progress, and is a review of various approaches to vulnerability assessments to inform the development of a new approach, which is more systemic in nature.						

* Baseline data and data for June has been updated/corrected since the previous report.

** Since beginning of project up to end of reporting period.

THEME TWO

SUPPORT FOR TRANS BOUNDARY INTEGRATED WATER RESOURCES MANAGEMEN

OUTCOME	INDICATOR LINKED TO OUTCOME	BASELINE 31/03/14*	TARGET SEPT 14	ACTUAL JUNE 14*	ACTUAL SEPT 14	CUMULATIVE SEPT 14**
Tenable systemic and multi-scaled IWRM governance arrangements and practices developed and institutionalized through reflective and collaborative processes	Nr of policies, laws, agreements or regulations promoting sustainable natural resource management and conservation that are implemented as a results of USG assistance	0	1	0	1	1
EXPLANATORY NOTES: This theme focuses on measures for water resources protection in the region (specifically the provision of Environmental Water Requirements - EWRs). It is building understanding about how ecosystems and therefore livelihood security can be explicitly planned for and integrated into institutional practices in both South Africa and Mozambique. Maruleng Spatial Development (see Theme Three technical summary) are now including information regarding water resources into their municipal plans. Maruleng Municipality have also requested further assistance with disaster and risk reduction strategies, including climate change.						
Improved management (through management plans) responding to CC vulnerability, water scarcity and adaptation needs in Integrated Water Resource Management	Nr of management plans in Natural Resource Management institutions incorporating Climate Change vulnerability, water scarcity and adaptation	0	0	0	0	0
EXPLANATORY NOTES: The support for existing and emerging institutional arrangements is necessary because, without a viable governance system, achieving the Theme Two and overall objectives will not be possible. This support is for organizations such as the Limpopo Commission (LIMCOM), the Olifants Letaba Catchment Management Agency (OLCMA), Ara-Sul, Catchment Management Forums (CMFs) and Water User Associations (WUAs) to develop adaptation strategies and practices to enhance water security and reduce vulnerability, such as climate change adaptation strategies; disaster and risk management plans; and compliance, monitoring and enforcement (CME) mechanisms. The fact that the Catchment Management Agency is not yet established is a major hinderance to supporting the development of these plans. Both South Africa and Mozambique had elections this year, and in South Africa this led to a new Minister of Water Affairs. Many initiatives have been halted with budget cuts to many activities.						
Improved configurations of practices contributing to resilience	Nr of water management practices institutionalized within Natural Resource Management entities (Water Management and Biodiversity)	0	0	0	0	0
		0	0	0	0	0
		0	0	0	0	0
EXPLANATORY NOTES: Practices are those that respond to climate change, and balance human and ecological demands. These include nine water-based and 15 biodiversity practices identified. Institutionalization means that a particular practice becomes part of the normal practice of the organization. This is a long-term goal but a research framework for understanding practices has been developed, and field research on this has begun (with over 20 practices described).						
Increased systemic understanding of water resources (availability and requirements) and drivers of change under different scenarios	Report on Water balance and potential threats for the ORB	0	1	1	0	1
EXPLANATORY NOTES: This assessment increased systemic understanding of water resources (availability and requirements), and drivers of change under different scenarios. Understanding water security focuses on a conceptual review; water balance; state of water quality; and future scenarios of the ORB as a whole system. This work is supported by a subcontract.						
Increased knowledge and systemic understanding of water resource protection-related practices	Report on Water quality issues and practices	0	0	0	1	1
EXPLANATORY NOTES: This assessment increases knowledge and systemic understanding of water resource protection-related practices. This work is supported by a subcontract. As a result of this report, Department of Water Affairs (Directorate of planning, water quality services) has requested AWARD's assistance for developing integrated water quality management strategy for the Olifants.						
Improved systemic and stakeholder-centred understanding developed of role of WatRES to well-being	Report on Socio-ecological water requirements under different scenarios and drivers	0	0	0	0	0
EXPLANATORY NOTES: This research improves systemic and stakeholder-centred understanding as developed by the WatRES methodology. This is supported by a subcontract and is expected in March 2015.						
Increase in institutions with adaptive capacity to respond to change/ resilience	2.9 Report on support for water-related institutional arrangements	0	0	0	0	0
EXPLANATORY NOTES: This assessment increases understanding of institutions, and how they may develop adaptive capacity to respond to change/ resilience. This work is supported by a subcontract. Key institutions are OLCMA (not yet established), DWAS, OLLI, and establishment of catchment management forums. In Mozambique it is Ara-Sul. This work is ongoing and the report is expected in Dec '14 (Mozambique has already been included in a report).						

* Baseline data and data for June has been updated/corrected since the previous report.

** Since beginning of project up to end of reporting period.

THEME THREE

BIODIVERSITY CONSERVATION IN CRITICAL AREAS OF THE BASIN

OUTCOME	INDICATOR LINKED TO OUTCOME	BASELINE 31/03/14*	TARGET SEPT 14	ACTUAL JUNE 14*	ACTUAL SEPT 14	CUMULATIVE SEPT 14**
Tenable systemic and multi-scaled biodiversity governance arrangements and practices developed and institutionalized through reflective and collaborative processes / Increase in priority biodiversity areas defined and identified through systemic inquiry	Nr of hectares under improved natural resource management as a result of USG assistance	0	0	0	0	0
	Number of hectares of biological significance/and or natural resources showing improved biophysical condition as a result of USG assistance	0	0	0	0	0
EXPLANATORY NOTES: Targets for these indicators will be set in Oct 2014 as per the new work plan 2015. Spatial development frameworks and initial scoping around protected area status (including implementation of the national buffer zone strategy around Kruger Park) within the Lower Olifants will inform this indicator. A key focus of this theme is to work with stakeholders in the development of a systemic framework supported by stakeholder-derived criteria to identify priority natural resource management area; threatened ecosystems and species; and indicators for assessing land-use practices. It explores ways of managing natural resources in order to build a resilient system.						
Improved configurations of practices contributing to resilience	Nr of policies, laws, agreements or regulations promoting sustainable natural resource management and conservation that are implemented as a results of USG assistance	0	1	0	1	1
EXPLANATORY NOTES: Improved environmental planning incorporated into the Maruleng Spatial Development Framework. Existing and emerging institutional arrangements and actions are strenghtened through aligning current management practices with emerging resilience and sustainability principles.						
Increase in systemic institutionalization of biodiversity spatial priorities into land-use planning and decision-making processes	Report biodiversity spatial assessments	0	1	0	1	1
EXPLANATORY NOTES: This assessment report increases knowledge of systemic institutionalization of biodiversity spatial priorities into land-use planning and decision-making processes. This work is supported by a subcontract.						
Improved land-use practice for improved Resilience (within SES guiding principles)	Report on Multi-criteria conservation priorities	0	1	1	0	1
EXPLANATORY NOTES: Report due in Dec '14. This assessment is developing a systemic understanding of natural resource management and its associated practices within the catchment. It will provide an assessment of land-use practice that will form the basis for improving Resilience in Phase Two. This work is supported by a subcontract.						
Increased understanding of Biodiversity stewardship as mechanism to improve the sustainability of land use, contributing to human well-being	Report on Protected Area expansion and Biodiversity stewardship	0	1	0	0	0
EXPLANATORY NOTES: Report due in Dec '14. This assessment increases understanding of biodiversity stewardship as a mechanism to improve the sustainability of land use, with a focus on contributing to human well-being. This work is supported by a subcontract.						
Improved understanding of management effectiveness model/ framework for PA and stewardship at catchment vs. reserve level developed	Report on Protected Area management effectiveness	0	1	0	0	0
EXPLANATORY NOTES: Report due in Dec '14. Work is on-going in case-study areas with regard to protected area management effectiveness in partnership with LEDET and MTPA. AWARD is a key strategic partner within Lowveld Steering Committee (to improve protected area management effectiveness, and to support the national implementation of a buffer zone strategy west of Kruger Park). This assessment is improving understanding of management effectiveness for protected area management and stewardship at catchment rather than reserve level. The assessment will inform the development of a framework. This work will be supported by a subcontract.						
Improved understanding of systemic and improved governance and oversight to promote resilience at catchment level and being institutionalized	Report on Biodiversity Governance / Institutional arrangements	0	1	0	1	1
EXPLANATORY NOTES: Spatial development framework has been submitted to Maruleng Muncipality. This work package is integrating all governance issues identified by other work packages. It provides the basis for improved understanding of systemic oversight and improved governance in order to promote resilience at catchment level. Implications for institutionalization will be carried forward to Phase Two. This work is supported by a subcontract.						

* Baseline data and data for June has been updated/corrected since the previous report.

** Since beginning of project up to end of reporting period.

THEME FOUR

LEARNING, CAPACITY DEVELOPMENT AND COMMUNICATION

OUTCOME	INDICATOR LINKED TO OUTCOME	BASELINE 31/03/14*		TARGET SEPT 14		ACTUAL JUNE 14*		ACTUAL SEPT 14		CUMULATIVE SEPT 14**	
Increased knowledge and awareness of climate change and biodiversity conservation	4.3 Nr of people receiving USG supported training in Natural Resource Management and/or Biodiversity Conservation	M	F	M	F	M	F	M	F	M	F
		0		0	0	5	2	0	0	5	2
EXPLANATORY NOTES: Formal training activities are only scehduled for 2015											

OUTCOME	INDICATOR LINKED TO OUTCOME	BASELINE 31/03/14*	TARGET SEPT 14	ACTUAL JUNE 14*	ACTUAL SEPT 14	CUMULATIVE SEPT 14**
Increase in stakeholder participation in cluster-based capacity developed	Nr of Cluster-based profiles	0	5	1	4	5
EXPLANATORY NOTES: V-STEEPs done in cluster two, four and five (total of five V-STEEPS). Reports are done after every V-STEEP. RESILIM O adopts a cluster approach to working with stakeholders. There are seven clusters comprised of a number of hydrological units (Figure 5). Clusters have been selected using criteria of convenience for stakeholder engagement, contextual similarity and land-use zonation. Stakeholder profiles, contextual profiling (V-STEEP), and the collaborative development of resilience practices will be conducted within the cluster framework. Input is obtained from stakeholders using multiple methods such as one-on-one interviews, focus group discussions, and multi-stakeholder sessions (known by the acronym of V-STEEP).						
Increased understanding and visibility of project	Nr of Communication and networking events: Print and electronics	0	10	2	2	4
		0	10	2	8	10
		0	20	4	10	14
EXPLANATORY NOTES: A strong communications strategy is important for the RESILIM O project in order to communicate its progress and findings .The Media and Communication Specialist received added days on her contract to increase media outputs in the most recent quarter. Print media events included: Ray Ison Article in Kruger to Canyon; Protected Area Artcile in Kruger to Canyon; eight stories posted on Facebook (212 followers).						
Increased understanding and visibility of project	Stakeholder database	0	1	1	1	1
EXPLANATORY NOTES: Comprehensive stakeholder database for both South African and Mozambican stakeholders. This facilitates detailed stakeholder profiling and analysis.						
Increased training on climate change and NRM practices to improve resilience	Nr of training events held	0	0	0	0	0
EXPLANATORY NOTES: Training to start in 2015. Theme Four is responsible for training programs to be conducted under Themes One, Two and Three.						

* Baseline data and data for June has been updated/corrected since the previous report.

** Since beginning of project up to end of reporting period.

THEME FOUR CONT.

LEARNING, CAPACITY DEVELOPMENT AND COMMUNICATION

OUTCOME	INDICATOR LINKED TO OUTCOME	BASELINE 31/03/14*	TARGET SEPT 14	ACTUAL JUNE 14*	ACTUAL SEPT 14	CUMULATIVE SEPT 14**
Increase in knowledge sharing, networking and exchange of experience with other basins	Nr of Co-Learning Network events	0	2	1	1	2
EXPLANATORY NOTES: Study tour from the Tanzania Water Board hosted by AWARD. AWARD also hosted five people from Tanzanian water boards to share learning for systemic basin management.						
Increased programmatic coherency and information sharing	Nr of meetings held with Res B	8	2	1	2	3
EXPLANATORY NOTES: Coordination with RESILIM B is critical, since there is great overlap between the work of RESILIM B and O. It is also important to harmonize understandings of resilience since both projects work with similar stakeholders.						
Increased programmatic coherency and information sharing	Nr of meetings / workshops / events held with other basin-wide initiatives	4	4	2	5	7
EXPLANATORY NOTES: Meetings with: Tanzanian Water Board, Middle Olifants Strategic Assessment (GIZ project), OLLI meeting, Limpopo Atlas, Ecosystem Services Conference						
Increased information sharing and networking between Incomati Usutu Catchment Management Agency and Olifants Letaba Catchment Management Agency	Nr of meetings / workshops / events held linking IUCM (Inkomati Catchment Management Agency) and OLCMA (Olifants Catchment Management Agency)	2	2	1	3	4
EXPLANATORY NOTES: The Phalaborwa Catchment Management Forum and Forum Task Team had a planning meeting to inform the Minister about changing the legal framework regarding the establishment of catchment management forums nationally. Forums give stakeholders the opportunity to participate in the management of the basin. This supports resilience on a local level. Derick du Toit is the chairperson of the task team. Meeting held with CROC water quality.						

	a) Results of organizational assessments and financial audits	No formal audits done yet	100% unqualified audits	n/a	100%	100%

OUTCOME		BASELINE 31/03/14*		TARGET SEPT 14		ACTUAL JUNE 14*		ACTUAL SEPT 14		CUMULATIVE SEPT 14**	
Effective organizational governance that that supports the programmatic objectives and organizational policies	b)Nr of staff trained / mentored on management practices and Organizational development	M	F	M	F	M	F	M	F	M	F
		8	7	9	8	9	9	9	9	9	9
	c)% of sub-contracts successfully completed	0% completed		50% to be completed		n/a		50% completed		50% completed	
EXPLANATORY NOTES: a) AWARD has undergone one audit (unqualified) b) Staff have received training on USAID policies and procedures and Monitoring and Evaluation. c) Many contracts have been extended to provide more time to complete research and other activities.											

* Baseline data and data for June has been updated/corrected since the previous report.

** Since beginning of project up to end of reporting period.

Overview **of Progress**

This section is based on our Results Framework which outlines the general program theory about how intended changes will be pursued. These intended changes are articulated as outcomes. To get closer to these, key activities have been designed and implemented, leading to specific and immediate outputs or "stepping stones" towards change.

The challenge lies in ensuring that these outputs (which often stem from practical key activities such as catchment-based assessments and stakeholder engagement) are transformed into higher-level outcomes. The middle column in the table below explains what has been done throughout the year to ensure activities and their outputs are transformed into outcomes. It has to be noted that a potential drawback of presenting this information in table format is that it appears as if the themes are operating in discrete "boxes", which is not the case – almost all aspects are interrelated and interdependent. The table format is used here simply to assist in communicating a rather large body of information in a clear manner. Within MEL, we will continue to experiment with new and better ways of communicating this type of data/information.

THEME ONE

INTEGRATED SYSTEMS AND RESILIENCE ANALYSIS AND ENSURING PATHWAYS TO IMPACTS WITHIN THE OLIFANTS CATCHMENT

OUTPUTS OF RELATED TO KEY ACTIVITIES	NOTABLE PROGRESS MADE DURING YEAR TOWARDS ACHIEVING THE OUTCOME	OUTCOME
Integrated trans-disciplinary conceptual framework and approach developed	Team Leaders and AWARD staff have started using the resilience framework within their different work packages. This enhances systemic thinking towards phase two of the project aimed at building resilience.	Trans-disciplinary systems hub established and functioning.
Assessment of power relationships and their influence on water and biodiversity management completed (political economy)	A report has been produced as part of a sub-contract, which outlines the history of institutional arrangements for water management areas for Mozambique. A similar report is being finalized for South Africa. This gives the project a better sense of how to work with the various government agencies to build resilience, based on their unique needs and histories. This work also informs trans-boundary institutional arrangements and a common purpose between South Africa and Mozambique.	Increased knowledge of the political economy within the basin (informing socio-ecological systems and resilience framework).
Assessment framework for livelihoods and natural resource dependencies informing socio-ecological systems and resilience (livelihoods and vulnerability)	A report is in the process of being completed that creates a spatial understanding (including demographics) of livelihood dependencies on eco-system services. Four typologies have been developed indicating different levels of direct dependency on natural resources, allowing for a comprehensive examination of the potential vulnerability of different livelihoods in the Oilfants catchment to climate- change impacts on water and biodiversity. This is vital for identifying communities most-at-risk of climate change due to their direct dependence on eco-system services. This is vital for phase two when resilience-building takes place.	Increased knowledge on livelihood dependencies on water and biodiversity and impacts of change are understood and institutionalized.
Assessment of stakeholder understanding of water-related ecosystem services informing socio-ecological systems and resilience	A participatory approach ("WatRES") has been field tested with stakeholders in one priority area, which further elucidates the relationship between ecosystems services and livelihoods on the ground. The project has conducted an analysis, which informs future activities. Furthermore, interviews have been conducted with key stakeholders regarding the classification process, which sheds light on how ecosystem services are classified and understood. This research indicated a very poor understanding about these linkages and informs programming to address this.	Increased knowledge on interlinkages between water-related ecosystem services (incl. biodiversity) and human well-being is incorporated into resilience thinking and planning.
Assessment framework for climate change, risks and threats informing socio-ecological systems and resilience	The process of developing a climate change vulnerability assessment and synthesis framework has been delayed due to the departure of a key staff member. However, the vulnerability assessment continues through research being undertaken in the various work packages, literature reviews and contextual profiling with stakeholders.	Increased knowledge on the potential impacts of climate change on resilience.
Assessment framework for guiding systemic resilience planning	The project has now identified individual drivers of climate change and vulnerability in the basin and is deepening understanding of each driver. The next step is to work with stakeholders to increase their own understanding in order to broaden collective response options and to plan for phase two of the project	Increased knowledge of risks and threats to the water and biodiversity resources and planning for resilience in this regard.
THESE OUTCOMES WILL FEED INTO:		
Tenable, multi-scaled climate risk adaptation strategies and practices developed and institutionalized through reflective and collaborative processes, to contribute to a resilient Olifants basin (high level outcome for theme).		

THEME TWO

SUPPORT FOR TRANS-BOUNDARY INTEGRATED WATER RESOURCES MANAGEMENT (IWRM) FOR THE OLIFANTS CATCHMENT

OUTPUTS OF KEY ACTIVITIES	NOTABLE PROGRESS MADE DURING YEAR TOWARDS ACHIEVING THE OUTCOME	OUTCOME
Assessment completed for water balance and potential threats for the catchment	Final report has been completed. The findings will be shared with stakeholders (including DWS, Ara-Sul, and other River Basin Organizations). These water balance results can be used to trigger resilient water management options in the priority sub-catchments (those in deficit and in balance), currently and in future under climate change. In order to understand water security in the Olifants catchment a systemic picture of the surface water resources has been developed, looking at both quantity and quality. Ensuring a positive water balance of acceptable quality into the future as well as ensuring that the ecological water requirements are met in part of resilience building at a systemic scale. Another important aspect of water security contained in both South Africa and Mozambique's policies is the commitments to meeting basic human needs and long-term sustainability.	Increased catchment-based understanding of water resources (availability and requirements) and drivers of change under different scenarios.
Assessment completed for water quality issues and practices	Report completed. This informs the focus in 2015 which is to build, together with stakeholders, an understanding of practices related to water quality as input to understanding the management of water quality as a contribution to the resilience of the catchment.	Increased knowledge and systemic understanding of water resource protection-related practices.
Assessment on socio- environmental flows under different scenarios.	Assessment is on-going. An assessment of the potential impacts of climate change on the water resources in the catchment is nearing completion. A central tenet of this work is that if people understand ecological water requirements and other water protection options they are more likely to support these in practice. WatRES is a process used to derive a collaborative understanding of water-related ecosystem services under different scenarios including climate change. This work is building towards a collaborative management for climate change with different stakeholders.	Improved systemic and stakeholder-centered understanding is developed of the role of ecosystems services in well-being.
Assessment on water-related institutional arrangements.	Assessment is nearing completion. Without a viable governance system, achieving water resources protection within IWRM will not be possible. The assessment therefore includes a synthesis of institutional arrangements for water resource management in South Africa and Mozambique. This understanding will help the project to support institutions in the future in order to build their adaptive capacity.	Increase in institutions with adaptive capacity to respond to change/resilience.
THESE OUTCOMES WILL FEED INTO:		
Tenable systemic and multi-scaled IWRM governance arrangements and practices developed and institutionalized through reflective and collaborative processes (high level outcome for theme).		

THEME THREE

BIODIVERSITY CONSERVATION IN CRITICAL AREAS OF THE BASIN

OUTPUTS OF KEY ACTIVITIES	NOTABLE PROGRESS MADE DURING YEAR TOWARDS ACHIEVING THE OUTCOME	OUTCOME
Assessment of spatial indicators (quantitative and qualitative) to monitor the current state of the catchment, and impact of current and changed practices.	**An integrated set of biodiversity spatial priorities have been developed to ensure biodiversity, water resource management, climate change and socio-economic issues are better integrated into spatial planning to reflect well-being and improved livelihoods and resilience. Spatial indicators (quantitative and qualitative) will be used to inform and monitor the current state of the catchment, and the impact of current and changed practices. Specific results for the year include:** Protected Area and Stewardship priorities developed on provincial levels which secure important biodiversity and ecosystem services and associated livelihoods Systematic Conservation Plan and biodiversity priorities for the Olifants catchment identified Developed spatial representation of drivers of land cover change – climate change, river threats status, mining, agricultural, human settlements, plantations Developed spatial representation of Threatened Ecosystem Status, including river threat status Inform input into Municipal Disaster Risk strategies and provincial climate change response plans, as well as the Biodiversity-Ecosystem Biome-based Climate change adaptation approach. Identification of biodiversity and ecosystem service priorities for Maruleng SDF – inform the Integrated Development Plan and environmental planning	Increase in institutionalisation of biodiversity spatial priorities into land-use planning and decision-making processes.
Assessment using stakeholder multi-criteria developed to identify hotspots, ecosystems and species for understanding land-use practices.	**Key highlights include:** Draft Integrated Biodiversity Conservation Framework developed (systemic criteria to inform biodiversity conservation priorities/identification of priority ecosystems and species) Natural Resource Management Framework/TOR co-developed with the K2C, and part of advisory committee for testing at the BSP-LUI (Biodiversity social projects-land use incentives) Mametja programe. Includes stakeholders in agriculture, communities, municipalities and SanParks. Report on Natural Resource Management practices supported to improve biodiversity and ecosystem services within the national "Working For..." public works programs (i.e. Working for Wetlands / Working for Water / Working for Land and land-use incentives)	Improved land-use practice for improved resilience (within social ecological systems guiding principles)
Assessment of Protected Areas expansion and Biodiversity stewardship.	**The value of the PA network as socio-ecological systems in the Olifants catchment is being investigated. Highlights include:** Spatial priorities for Protected Area Management and stewardship identified Conceptually and institutionally coordinating the "status quo" assessment of protected areas and stewardship, in partnership with the MTPA, LEDET, SANParks and private reserves (with special focus on informing the GEF PA program) Draft beneficiation framework developed through multi-institutional partnerships, for the KNP Buffer Zone – ongoing process being institutionalized in the K2C (K2C has been appointed together with SanParks as the implementer of the Lowveld GEF PA program).	Increased understanding of biodiversity stewardship as a mechanism to improve the sustainability of land-use and to contribute to human well-being.
Completion of assessment of protected areas management effectiveness.		Develop an improved understanding of protected area and stewardship status, models and management effectiveness at catchment vs. reserve level.
Assessment of Governance / institutional arrangements for biodiversity and conservation.	**Limited understanding of the complexity of biodiversity conservation is an obstacle to achieving biodiversity conservation outcomes. To address this:** Report on key governance and practices pertaining to Biodiversity Draft Integrated Biodiversity Conservation Framework developed (Identification of priority ecosystems and species, with reference to criteria and principles developed under the Framework) Inputs into the Maruleng Local Municipality spatial development framework, and participation in the IDP (Integrated Development Plan) process Inform the K2C "Man and Biosphere" Institutional arrangements (up to the National level – DEA) – special reference to the K2C as the Network Coordinating Unit working towards integrating the Lowveld Steering Committee Forum, Natural Resource Management Forum, DEA Wildlife Economy and Biodiversity Social Projects. Drafting of legal framework (macro-level) for the GLTFCA	Improved understanding of systemic governance and practices, being institutionalized to promote resilience at catchment level)

THESE OUTCOMES WILL FEED INTO:

Tenable systemic and multi-scaled biodiversity governance arrangements and practices developed and institutionalized through reflective and collaborative processes.

THEME FOUR

LEARNING, CAPACITY DEVELOPMENT AND COMMUNICATION

OUTPUTS OF KEY ACTIVITIES	NOTABLE PROGRESS MADE DURING YEAR TOWARDS ACHIEVING THE OUTCOME	OUTCOME
Established cluster-based approach stakeholder for meetings and learning.	Social learning methodology developed to engage stakeholders. Ongoing support for other themes with stakeholder engagement through VSTEEP . Stakeholder database phase one completed which allows AWARD to track stakeholders engagement over time, per sector (i.e. civil society, government, agriculture, etc). The database also tracks stakeholder practices and communication.	Increase in stakeholder participation and capacity in clusters.
Development of communication and networks through media and stakeholder partnerships.	AWARD website completed with RESILIM-O page, currently being updated. Revision of internal and external reporting processes. "Our Olifants" campaign planned as a way to mobilize and inform civil society about resilience practices in the catchment. Facebook page set up with weekly updates and "calling cards" to encourage people to interact with the website and Facebook page. Partnerships developed: Memorandum of Agreement signed with municipalities (Maruleng, Elias Motswaledi, Greater Tubatse and tribal authorities (Mafefe, Malepe). This means the project is getting institutional commitment from key stakeholders who have been earmarked for future training and capacity-building on resilience and climate change. These municipalities will become spatial focus areas.	Increased understanding and visibility of project.
Development of training and skills programs.	Professional development framework developed towards long-term capacity building of key stakeholders involved in practices to promote resilience (i.e. local government, environmental forums, catchment management forums, etc). Stakeholder training needs have been analyzed according to resilience practices.	Increased training on climate change and NRM practices to improve resilience.
THESE OUTCOMES WILL FEED INTO:		
The capacity and competency of stakeholders is improved through social learning processes with a focus on the development of sustainable practices and a collective identity which are needed to implement systemic natural resource management (suggested change). Capacity of stakeholders in ORB is built through social learning for the development of sustainable practices that contribute to resilience and the collective identity / Improved capacity and competence to implement systemic Natural Resource Management practices.		

CROSS CUTTING

OUTPUTS OF RELATED TO KEY ACTIVITIES	NOTABLE PROGRESS MADE DURING YEAR TOWARDS ACHIEVING THE OUTCOME	OUTCOME
Interaction with other basin-wide initiatives.	Exchange visit with Tanzanian Ruaha Water Board increased understanding on water management challenges in post-colonial Africa. Several meetings with National Department of Water and Sanitation highlighted the need for better integration of water management efforts. It has also assisted the project to identify the specific professional skills that water managers need in the future. Meetings with LIMCOM and RESILIM B integrated the Olifants into the Limpopo basin	Increased programmatic coherency and information sharing.
Interaction with river basin organizations (LIMCOM, IUCMA, Forums)	The project has assisted IUCMA to establish and refine an integrated water quality framework which is a basin-wide approach towards managing water quality. This has far-reaching implications for the monitoring of water quality in both South Africa and Mozambique. The project is currently working with national government to establish catchment-wide management forums, that will work in synergy with the Olifants Letaba Catchment Management Agency (a body that the Minister has to appoint).	Increased information sharing and networking between Incomati Usutu Catchment Management Agency and Olifants Letaba Catchment Management Agency.
Networking and information sharing.	The project now participates in a number of natural resource management forums, such as LEDET Environmental Forum and Mining Environmental Forum (involving 21 mining operations), Greater Sekhukhune Environmental forum, Kruger to Canyon, GEF forum and the Phalaborwa Catchment Management forum. The purpose of the forums are to raise important issues pertaining to issues such as water quality monitoring, norms and standards setting, disaster management, climate change research, etc.	Increased learning from experience in the basin.
THESE OUTCOMES WILL FEED INTO:		
Increase in knowledge sharing, networking, and exchange of experiences with other basins.		

OUTPUTS OF RELATED TO KEY ACTIVITIES	NOTABLE PROGRESS MADE DURING YEAR TOWARDS ACHIEVING THE OUTCOME	OUTCOME
Appropriate finance, operations and contract management systems are developed and implemented.	The organization had two audits in the year, both unqualified. All financial and human resource policies and procedures were finalized this year.	Effective organizational governance that supports the programmatic objectives and organizational policies.

This table, taken together with the quantitative data, provides a picture of the work that has been taking place to produce immediate outputs, which in turn supports the attainment of the long-term outcomes. Catchment-based research is pivotal to attaining many of the outcomes of Phase One. For this reason a synopsis of progress and a summary of the research outputs are given in the Appendix to Section Three.

Way Forward: **Learning and Responses**

As indicated at the beginning of this report, the challenge for the USAID: RESILIM O project is to work systemically and pull all the various technical reports, stakeholder inputs, and profiles together into a coordinated picture that will inform the activities for 2015, as well as the subsequent Phase Two of the project. In that respect, much of the work in 2014 has been formative, and will be used as the basis for end-of-year strategic planning. This planning process will draw heavily on the integrated insights gained from the past year. This process therefore has not been covered in this report, but it will make use of evaluative methodologies such as the "Most Significant Change" narratives and will be reported in the coming year. We hope to dedicate the first quarterly report of 2015 to the most significant insights emerging from all the work to date. These will be formative in the implementation of project activities for the coming years.

The collaborative contextual profile will be finalized in 2015. It will be the basis for the resilience assessment. This assessment will mark the end of Phase One, upon which a set of integrated outcomes will be developed for Phase Two. In the coming year, we will be working closely with stakeholders to ask the question: Why is the context of the Olifants catchment the way it is? (How has it come to be?) in order to initiate the basis for planning meaningful transformation towards a more resilient catchment.

APPENDIX TO SECTION **03**

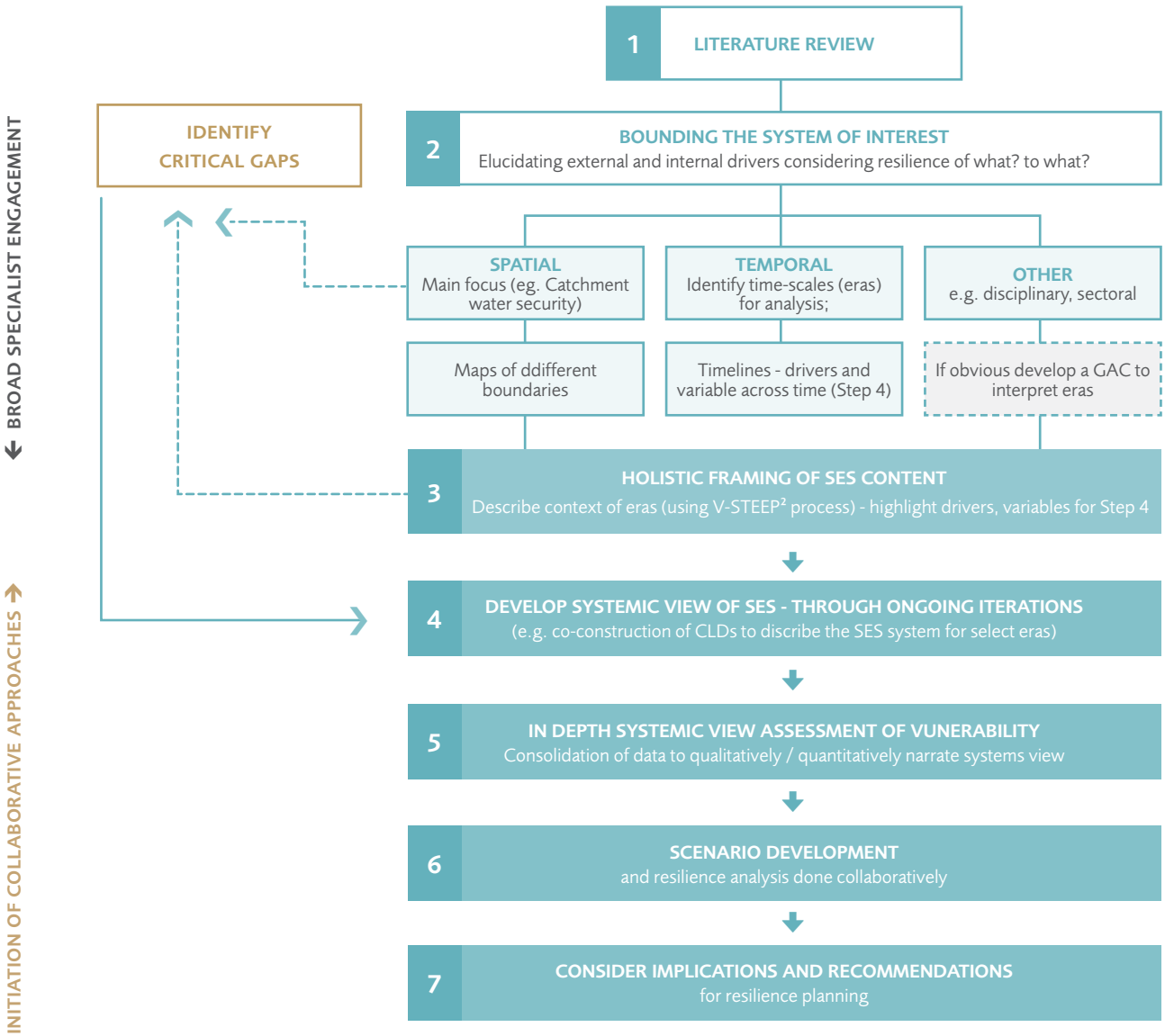
Overview of **Technical Reports for 2014**

This section will highlight key achievements for the year in terms of the research outputs produced by specialist consultancies working in partnership with AWARD. The main focus will be to provide a summary of the technical reports that are being prepared during Phase One of the project. These reports, along with the collaboratively developed contextual profiles, will feed into the resilience assessment for the catchment. The assessment will form the basis for collective efforts to build and institutionalize resilience practices for the catchment in Phase Two of the project.

THE DEVELOPMENT OF A SYSTEMIC, PARTICIPATORY RESILIENCE ASSESSMENT OF THE OLIFANTS CATCHMENT

During 2014 the project prepared the foundations for a Resilience Assessment informed by a systemic and social learning approach. This is central to Phase One (first two years), as it provides the holding framework for integrating all the technical work packages that are summarized in this section. The figure depicts the process. Major progress has principally covered Steps One-Four (and some of Step Five). The remaining steps will be the focus of 2015.

Overview of the resilience assessment as proposed by RESILIM O



The overall approach, which is considerably different to a conventional vulnerability assessment, is a key innovation of the work. It is based on an adaptive process that allows for the incorporation of "new information as it is brought to the table." A number of additional principles frame the approach: (a) it must facilitate the incorporation of broad "types" of information (e.g. socio-economic, ecological); (b) it must allow for participatory stakeholder processes which; (c) adopt a social learning approach and; (d) it must enable the development of systemic view(s) with stakeholders (at different scales and levels of details). This approach supports the overall project goal, which is to reduce vulnerability to climate change through building improved trans-boundary water and biodiversity governance, and management of Olifants catchment through the adoption of science-based strategies that enhance the resilience of its people and ecosystems through systemic and social learning practices.

The sub-contracts and work packages of the first phase of RESILIM O are aimed at developing a contextual understanding, not only in terms of the biophysical nature of the catchment, but also in terms of institutional structures and constraints; stakeholder engagement (which includes issues of power and agency); and trans-boundary opportunities and challenges. This contextual understanding will identify key external and internal drivers in the Olifants River basin.

Subcontracts were awarded as part of Phase One to a variety of consulting agencies, research groups, and partners who specialize in particular areas relevant the project outcomes. Below is a collection of summaries of the technical reports. Some were completed in 2014, while others are on-going. The summaries are presented in three categories according to the particular thematic area of the project with which they are associated.

1. These are overarching, "cross-cutting" studies fundamental to understanding how a resilient catchment can be built irrespective of a particular area of natural resources management.

2. These are technical studies that feed directly into the area of integrated water resources management.

3. These technical reports are largely associated with biodiversity, conservation and protected area management.

These summaries do not focus on the methodologies used for these studies (this can be found in the full reports, which are available upon request).

Overarching
Technical Reports

TECHNICAL REPORT ONE

GOVERNANCE OF NATURAL RESOURCES IN THE OLIFANTS CATCHMENT

SUMMARY TABLE	
TITLE	Political economy of water and biodiversity – Mozambique and South Africa: understand how institutions have developed and are developing in the different socio-economic and environmental settings in the basin within the context of increasing scarcity of natural resources (water and biodiversity).
CONSULTANTS	Jordi Gallego-Ayala and Pegasys
PURPOSE OF STUDY	Increased knowledge of the political economy within the basin so as to inform action plans (yr three-five). In order to institutionalize resilience practices and the capacity to adapt to climate change, it is vital to understand key water and biodiversity institutions and how these institutions function.
STATUS	Mozambique work completed. The South African study will be completed in 2015. The institutional arrangements in Mozambique have been described under this work package. This will guide the project's relationship building with Ara-Sul (RESILIM O strategic partner) in relation to its management units and committees.

SUMMARY

A number of deliverables under this study have now been completed for South Africa and Mozambique. Understanding different institutional histories is important for a systemic framing of resilience because this should transcend sovereign (at least conceptually) boundaries. For example, giving effect to sustainability and equity (each of which has different emphases in each country) has trans-boundary implications: ensuring water for the Limpopo estuary needs to be captured in Mozambique's and South Africa's policy intent, since it involves allocations, potential restrictions, and regulation on both sides of the border. This will be examined further in future work. **The following provides a summary of the political economy with a focus on water:**

Two separate eras in Mozambique are analyzed: the Mozambican post-independence period from 1974-1991, and the multi-party era which spans from 1992-present. The latter is the focus of this summary. The 1991 Water Law was (and still is) a landmark in the water sector in Mozambique. Rooted in the integrated water resources management paradigm, it laid the foundations for the decentralization of water institutions. The main principles embodied in the Water Law were the sustainable use of the water resources, a recognition of the social and economic value of water, and the participation of stakeholders in water resources management. Following the approval of the National Water Law in 1991, the National Directorate of Water started a process of decentralization, de-concentration, and devolution of its core activities in crucial areas of responsibility. This process meant creating water resources management institutions at river basin level. The Regional Water Administrations for Southern Mozambique (RWA-South), the Limpopo River Basin Management Unit, and the Limpopo River Basin Committee were created, and their main function was to facilitate the operational water resources management at the regional level. It should be clarified, however, that the relationship between the RWA-South (Ara-Sul) and DNA is not always as clear as it needs to be; there are issues of mandate between both institutions.

With respect to South Africa, the analysis covers a period of more than 100 years, explaining changes in the water economy and in water services delivery from early 1900 to post-1994 in the Olifants basin. Beginning early 1900s, the key recipes for state-supported, race-based wealth accumulation were in place (Merry et al, 2009: 52). Throughout the apartheid era, water development was used to deepen further the divide between privileged whites and the black majority. Post-1994, the mission of the state changed radically from serving a small formal and well-organized white constituency to serving an entire nation of over 40 million citizens, deeply divided by wealth differences, and territorial and institutional segregation among others (Van Koppen, 2008: 435). The context of glaring inequities between the poor, largely black, majority and the wealthy, largely white, minority is well-recognized by government. Indeed, the key water challenge in this basin, as in many other basins in South Africa, is the improvement of the livelihoods of all, among others through stronger legal and realized water entitlements, given that hardly any of the historically disadvantaged individuals has a water entitlement in his or her name (Merry et al, 2009: 60).

The new dispensation ushered in an entirely new nation-wide formal governance structure. The key legislation included: the Constitution of the Republic of South Africa, the National Water Act of 1998, the Water Services Act (1997) and the Municipal Structures Act, among others. The Department of Water and Sanitation (DWS, previously the Department of Water Affairs) must ensure that water is protected, used, developed, conserved, managed, and controlled in a sustainable and equitable manner. Catchment Management Agencies are entrusted water resource management to the local level and thereby ensure community participation.

Results indicate that, despite the enabling framework provided by legislation and policy, and the wide recognition of the need to redress past imbalances in access to water, and to democratize water management institutions, experience to date has shown the difficulties of ensuring full participation in these institutions (Schreiner et al, 2004; Anderson, 2005; Masangu, 2008; Sithole, 2011).

In terms of trans-boundary arrangements, SADC has developed a wide range of policy instruments for integrated water resource management since the late 1990s. The 2001 revised Protocol on Shared Watercourses promotes the establishment of river basin organizations, and shared river basin management by member states. The Limpopo Watercourse Commission (LIMCOM) was established by an agreement signed by representatives from Botswana, Mozambique, South Africa, and Zimbabwe in 2003. The ratification process for the agreement was completed in 2011. This agreement is preceded by other agreements. The Limpopo Basin Permanent Technical Committee (LBPTC) was established in 1986 and the last meeting was in November 2010 in South Africa.

TECHNICAL REPORT TWO

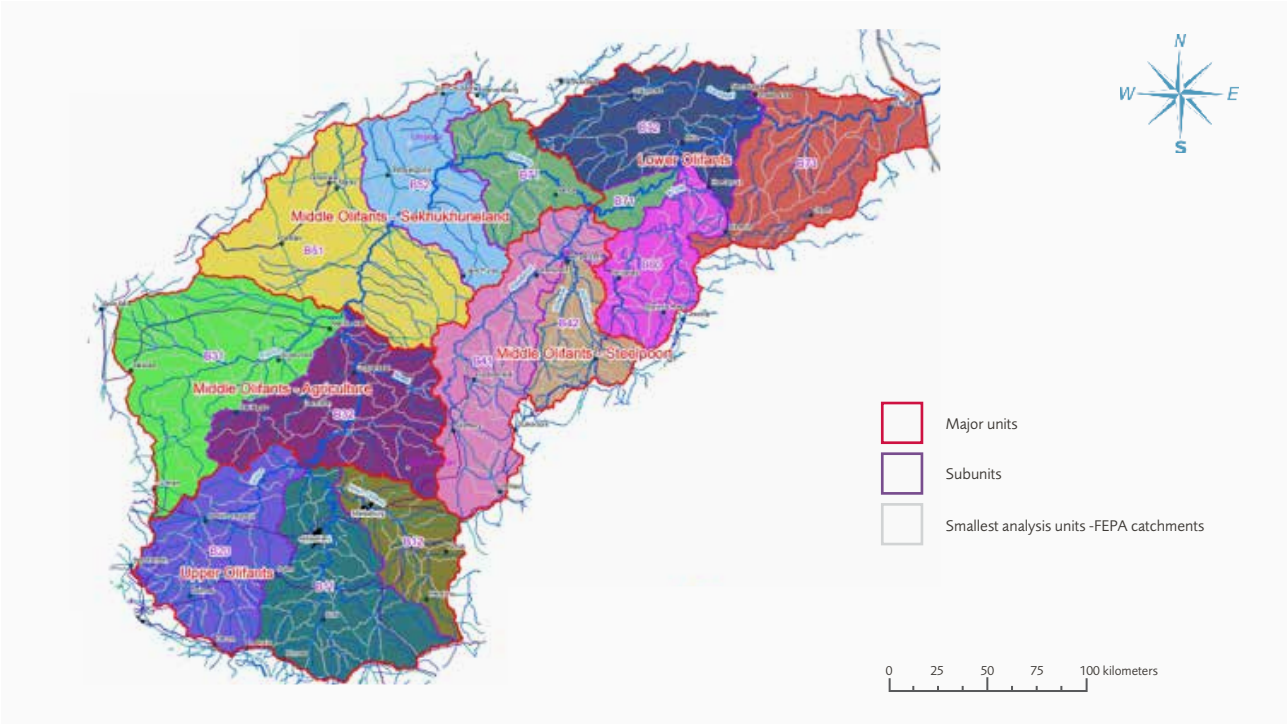
SPATIAL ASSESSMENTS OF THE OLIFANTS CATCHMENT

SUMMARY TABLE	
TITLE	Spatial assessments: support for the integration of biodiversity, water resource management, climate change, and socio-economic issues into spatial planning (to support improved livelihoods security and resilience).
CONSULTANT	Stephen Holness
PURPOSE OF STUDY	Systemic institutionalization of spatial priorities into land-use planning and decision-making processes. A set of collective spatial indicators developed (quantitative and qualitative) to monitor the current state of the catchment, and the impact of current and changed practices.
STATUS	**Work on-going. Current work includes:** Spatial overview of important critical biodiversity areas and integrated biodiversity conservation areas Climate change hot spots identified Initial spatial overview of mining activities Initial overview of river threat status Environmental layers developed for spatial development framework for Maruleng Detailed spatial information for Protected Area network and Stewardship network

SUMMARY

The aim of this study is to improve the spatial understanding of the socio-ecological system in the Olifants, so as to understand the spatial priorities for landscape intervention (particularly in relation to climate change), and to improve access to spatial data internally and, where possible, with external stakeholders.

The map below represents the units that will form the basis for resilience planning within the Olifants catchment.



The table below, entitled "Impacted Landcover Classes", illustrates the large-scale land transformation for urban and settlement, cultivation, and mining in the Middle and Upper Olifants, as well as at the upper Lowveld areas of the Lower Olifants. Overall, 59.5% of the catchment remains in a natural condition (see Table below). This implies that the catchment is teetering on the boundary of being ecologically sustainable according to the 60% threshold used for vulnerable ecosystem in the National Biodiversity Assessment 2011 (Driver et al, 2012). Critically, certain units such as the Upper Olifants and the Middle Olifants – Sekhukhuneland with 42.6% and 43.4% natural habitat – fall well below this critical function threshold. In addition to complete land transformation, significant additional areas are classified as degraded, which reduces resilience, ability to deliver ecosystem services, and impacts on biodiversity value.

IMPACTED LANDCOVER CLASSES IN THE OLIFANTS CATCHMENT

Landcover in the Olifants River catchment summarized in hectares.

TRANSFORMED AND DEGRADED LANDCOVER								NATURAL	TOTAL
	Cultivation	Mines	Plantations	Urban Built-up	Water-bodies	Degraded	TOTAL	NATURAL	TOTAL
Lower Olifants	68821	4463	32462	26050	12139	74887	218821	1039100	1257921
B60	24984	61	29717	4361	8790	3556	71469	212505	283974
B71	6877			2992	18	11166	21053	45378	66431
B73	4837	120	2709	5559	1985	3634	18844	443618	462462
Middle Olifants Agriculture	316601	755	3983	52227	21005	89460	484031	633419	1117450
B31	214124	553	1355	34580	8723	71804	331139	275663	606802
B32	102477	202	2628	17647	12283	17655	152892	357756	510648
Middle Olifants Sekhukhuneland	353521	1317	4255	73253	3550	250826	686722	527141	1213864
B51	241619	865		31941	2817	153030	430271	190138	620409
B52	85805	148	1239	29244	683	85658	202778	150283	353061
B71	26097	304	3016	12068	50	12138	53674	186720	240393
Middle Olifants Steelpoort	87446	2221	9028	19905	22264	15573	156435	555637	712072
B41	70501	1955	5591	17234	13329	15049	123659	380845	504504
B42	16944	266	3437	2672	8934	523	32777	174792	207568
Upper Olifants	522261	29737	11139	23445	66652	2518	655752	486021	1141772
B11	212240	22260	2552	10531	34074	-	281657	188803	470460
B12	115645	5345	3377	5256	11375		140998	96684	237682
B20	194376	2132	5209	7658	21203	2518	233097	200534	433631
Grand Total	1348651	38492	60868	194879	125610	433262	2201762	3241318	5443080

Percentage Cultivation per quinary in the Olifants catchment

By area, cultivation is by far the dominant agent of landcover change, covering approximately a quarter of the total catchment, and approximately 45% in the heavily impacted Upper Olifants, and around 30% each in Middle Olifants – Sekhukhuneland – agriculture (see map above). The map below showing degraded landcover also reflects the apartheid land distribution system of the old homelands of Lebowa, a pattern which persists to the present day. Cultivation areas are also associated with these homeland footprints.

Percentage degraded landcover classes per quinary in the Olifants catchment

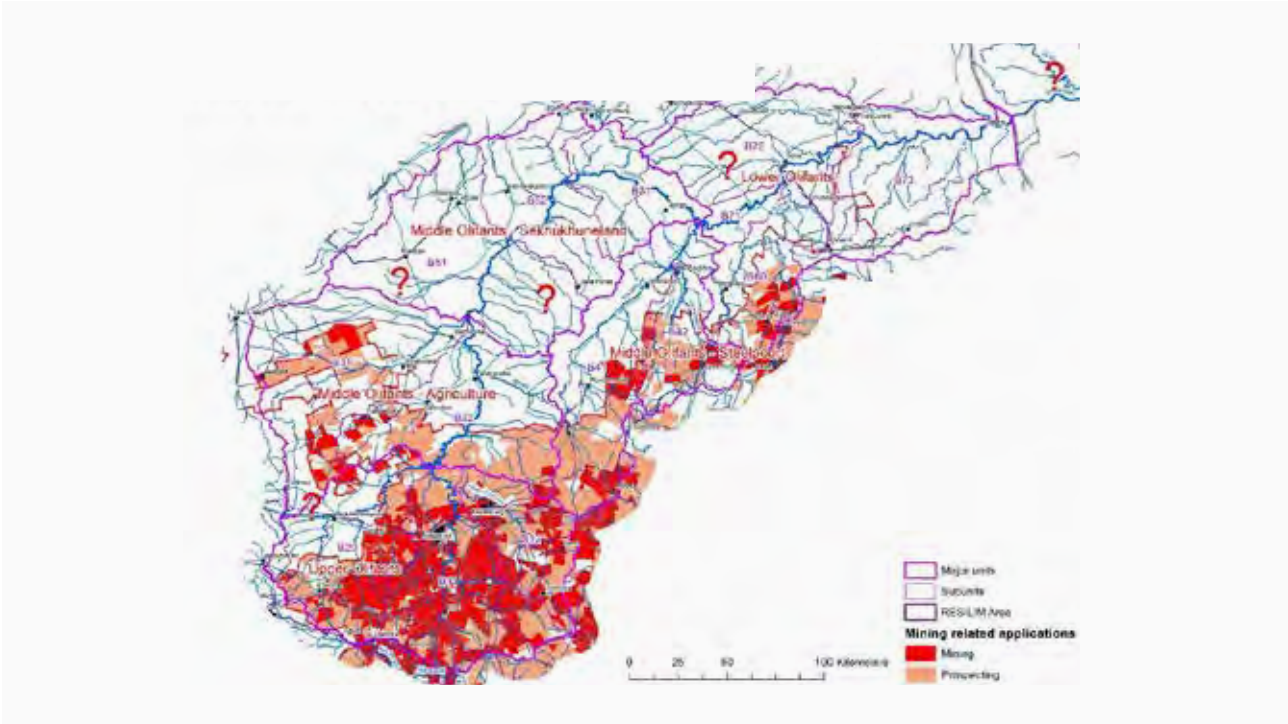
SPATIAL DRIVERS

Institutional: The Olifants spatial classification and layers do not correspond with municipal, district or provincial political boundaries, which may present problems for implementing agents such as Conservation Agencies and municipalities, and these could have specific administrative or jurisdictional boundaries.

Mining: Although the current footprint of mining in the catchment is geographically limited, there has been an enormous expansion in mining and prospecting applications, and a dramatic expansion of mining effort can be expected in the Upper Olifants and Middle Olifants – Steelpoort units (see map above). Note that there is no readily available information on the extent of mining and prospecting applications In Limpopo Province.

Future work will focus on the current status quo of mining activities within the catchment, especially within Limpopo Province.

Mining and prospecting applications in the Olifants catchment. A status quo report on mining pressure, especially within Limpopo province, will be undertaken



TECHNICAL REPORT THREE

SPATIAL ASSESSMENTS OF THE OLIFANTS CATCHMENT

SUMMARY TABLE	
TITLE	Climate change: understand potential impacts of climate change (and other change factors) on resilience
CONSULTANT	Professor Coleen Vogel
PURPOSE OF STUDY	Increase knowledge on potential impacts of climate change (and other drivers) on water, biodiversity and resilience.
STATUS	On-going. Climate change has been conceptualized, as well as current practices (i.e. disaster management), and climate change's implications for vulnerability and resilience. This serves as a basis for exploring adaptive responses to climate change together with stakeholders

SUMMARY

The climate change work consists of two components, namely:

- Modeling the potential impacts of climate change on natural resources, especially water
- Developing a framework and approach for working with stakeholders to improve planning and responsivity to climate change and other risks

The impact of climate change (CC) on the water resources of South Africa is the subject of extensive research, as it affects the resilience of catchments. As a key driver of change, RESILIM O undertook to understand projected impacts of CC in the Olifants catchment. Unfortunately, outputs from the multiple General Circulation Models (GCM) for the Lowveld are so diverse that they prove less than useful in interactions with stakeholders. It was deemed possible, however, to look more closely at impacts on runoff and hence on water availability. The objective of this summary is to present an assessment of the impacts of climate change on runoff at selected quaternary catchments where the General Circulation Models (GCMs') downscaled data is available in the Olifants catchment. This work is in progress and hence provides examples of indicative results only.

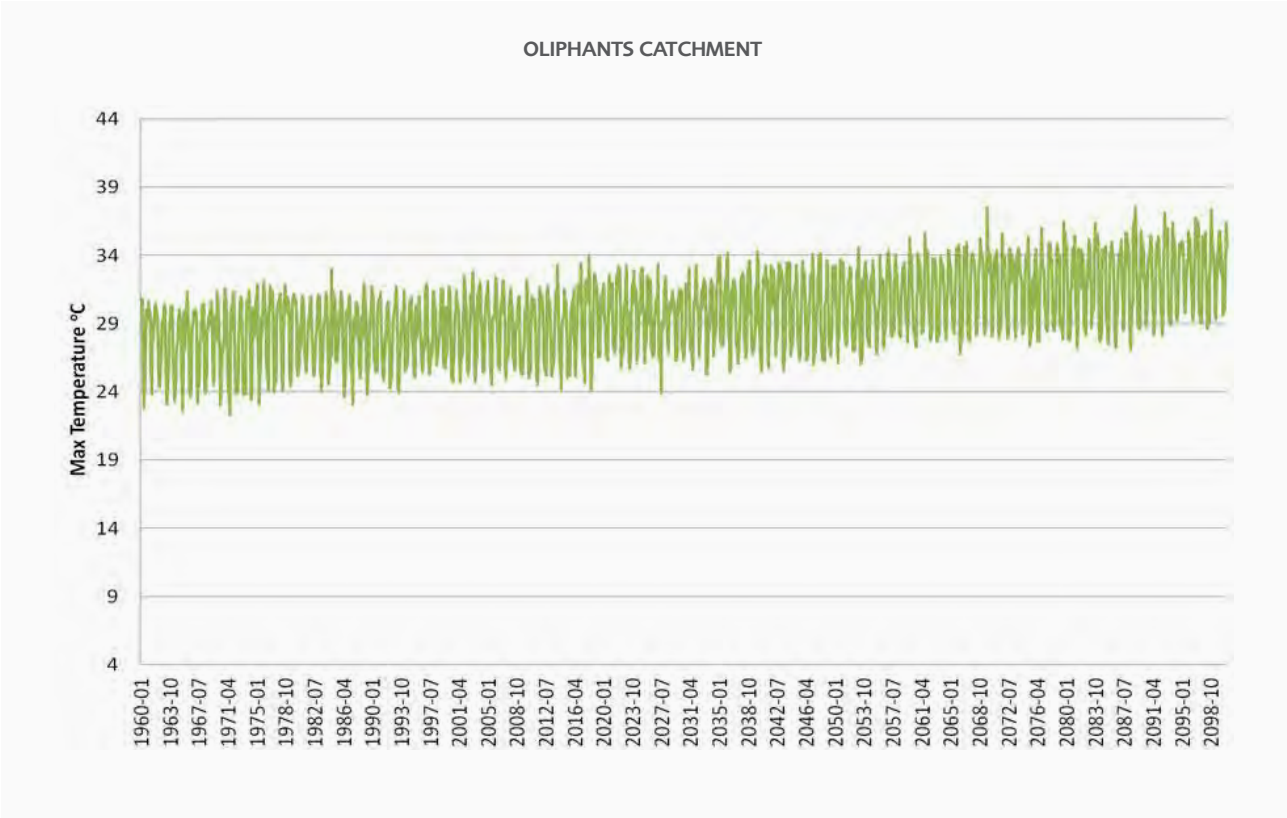
The possible future rainfall change envelope was obtained using the 10 GCMs (see internal report). The data was downscaled empirically using the Self-Organizing Map Downscaling (SOMD) technique, which provides meteorological station-level response to global climate change (Hewitson and Crane, 2006).

The first-order assessment, which gives an indication of how future rainfall and temperature will change, was done by analyzing historical records and the future projections from GCMs. The second-order assessment involved assessing how changes in climate will affect the water resource through changes in runoff, which is useful for water supply systems. This assessment was determined through inputting climatic changes into Pitman Model (Pitman, 1973; a hydrological model) to assess changes in runoff of the system or catchment. For illustrative purposes the results from two quaternary catchments, B32C and B42B out of the 12 selected sub-catchments in Olifants Basin, are presented.

Future changes in evaporation demand were calculated from temperature changes. The historical runs of the hydrological model were based on fixed mean monthly evaporation demands (PE: potential evapotranspiration) taken from Surface Water Resources (WR) studies in 1990 and 2005 (WR90 or WR2005) that are based on Pitman Model in South Africa (Midgley et al, 1994). The maximum and minimum temperature data for the baseline and future climate model scenarios were used to determine the temperature component of the Hargreaves' Equation (Allen et al, 1998). The percentage increases in these temperature values, from baseline to future, were then used to scale the historical seasonal distributions of potential evaporation used to run the hydrological model for future scenarios. Temperature change was estimated for the baseline (1960-1980) and future (2040-2060), based on the Phalaborwa station, given that temperature variability is low compared to rainfall.

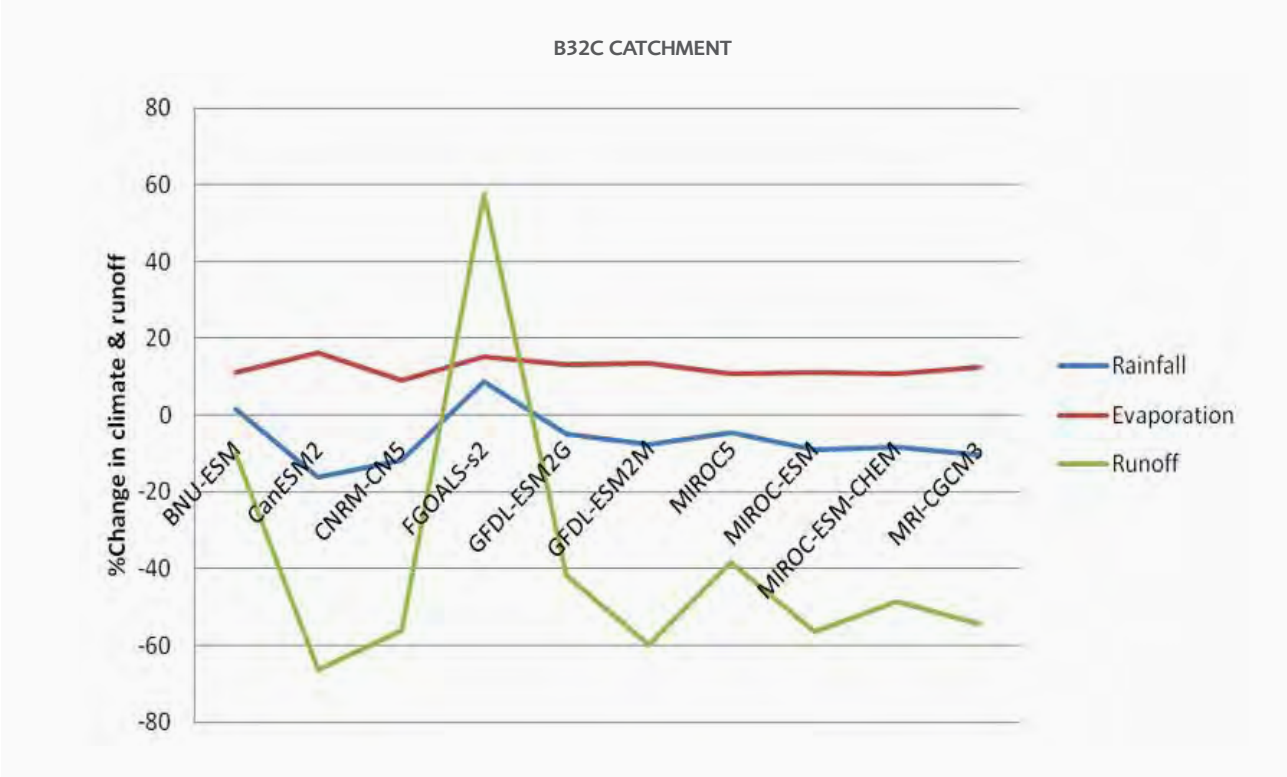
The selection of GCMs used in the hydrological model was based on their temperature or evaporation prediction performance, as there is greater confidence in the direction of temperature change (see graph below) than rainfall change. The GCMs that gave maximum, median, and minimum scenario from the baseline scenario were used in the monthly time-step hydrological model (Pitman model), so as to cover the spectrum envelope of all GCMs. Therefore, the following models were selected for all 12 sub-catchments used in this study: (i) Maximum scenario: CanESM2 model; (ii) Median scenario: GFDL-ESM2G model and; (iii) Minimum scenario: CNRM-CM5. Under runoff response assessment, all the other anthropogenic factors were fixed for the baseline and future scenarios, as land use plays a significant role in runoff changes.

Oliphants catchment - Change in temperature based on GFDL model (1960 – 2098) (Phalaborwa)

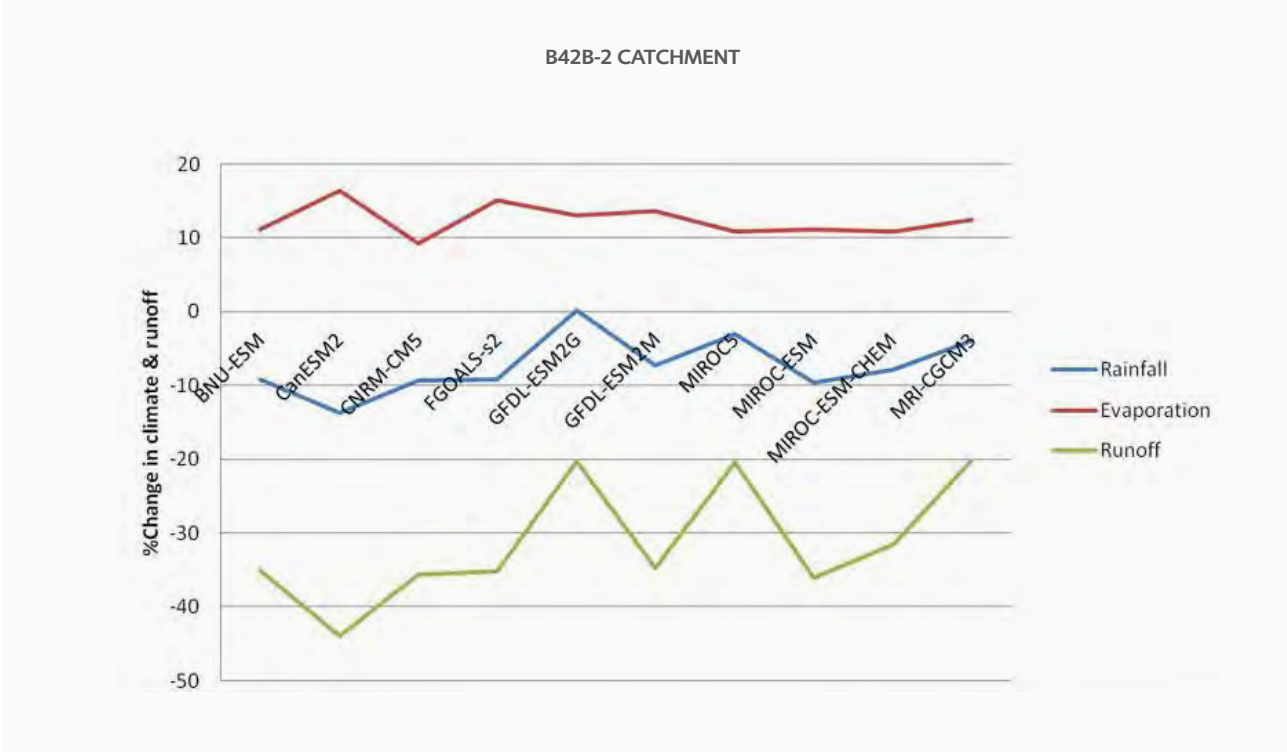


PRELIMINARY RESULTS

Change of climate and runoff (from baseline) based on 10 GCMs in B32C quaternary catchment



Change of climate and runoff (from baseline) based on 10 GCMs in B32C quaternary catchment.



In conclusion, it should be noted that climate change is an evolving science, and that both models and downscaling techniques are associated with uncertainty, and are constantly being improved and updated. Generally, all model projections showed a decrease in mean annual precipitation for the Olifants catchment (based on two sub-catchments used), and a possible shift in the peak of the rainy season, which users – especially farmers and water services authorities – need to adapt to for economic and environmental sustainability. Also, some mines have been facing challenges of tailings dam spilling, due to extreme rainfall events, resulting in environmental pollution, and thereby reducing the resilience of the catchment. The next step is to assess other sites with downscaled climate data in the Mozambican part of the basin to have a holistic understanding of climate change impacts in the Olifants basin.

There are now a number of internal reports which detail: (1) listed network of specialists, managers, regulators involved in the basin in CC and DRM activities; (2) an annotated list of existing "products" produced in these fields, and important gaps and; (3) a draft publication synthesized from peer-reviewed literature, on vulnerability in the basin, to act primarily as a baseline.

It is noted, too, that climate change, and disaster and risk management need to be nested within the hierarchical governance system. The SADC provides a framework and protocols (see Climate Services Centre, which RESILIM O has initiated cooperation with) into which regional, national, provincial and district planning need to take place. These protocols will guide future work at multiple scales.

TECHNICAL REPORT FOUR

LIVELIHOOD DEPENDENCIES AND VULNERABILITY IN THE OLIFANTS CATCHMENT

SUMMARY TABLE	
TITLE	Livelihoods: understanding livelihood dependencies on water and biodiversity and the impacts of environm ntal change
CONSULTANT	AWARD and PLAAS (Institute for poverty, land and agrarian studies), University of Western Cape
PURPOSE OF STUDY	Increase knowledge of livelihood security within the basin so as to inform action plans (yr three-five). Also to consider how institutional arrangements may incorporate this study into resilience planning.
STATUS	Final report due in December 2014. Four typologies have been developed indicating different levels of direct dependency on natural resources, allowing an examination of the potential vulnerability of different livelihoods in the Olifants catchment to climate change impacts on water and biodiversity. This work feeds into the systemic, participatory understanding of the Olifants catchment (with a focus on the inter-linkages between ecosystem services, livelihoods and drivers of change, which includes climate change).
SUPPORTS PROJECT OUTCOME	Increased knowledge on livelihood dependencies of water and biodiversity, and impacts of change understood and institutionalized

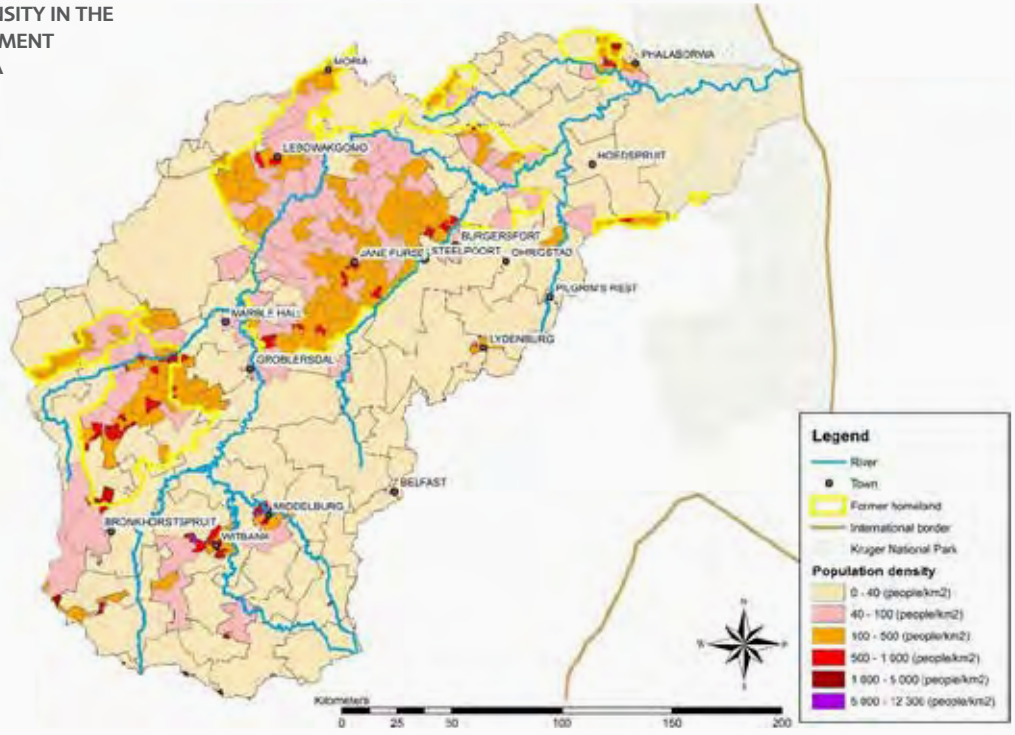
SUMMARY

Work has started with a focus on water-related ecosystem services through both a desktop analysis and fieldwork. This study highlights how an understanding of vulnerability is key to understanding the resilience of the Olifants catchment.

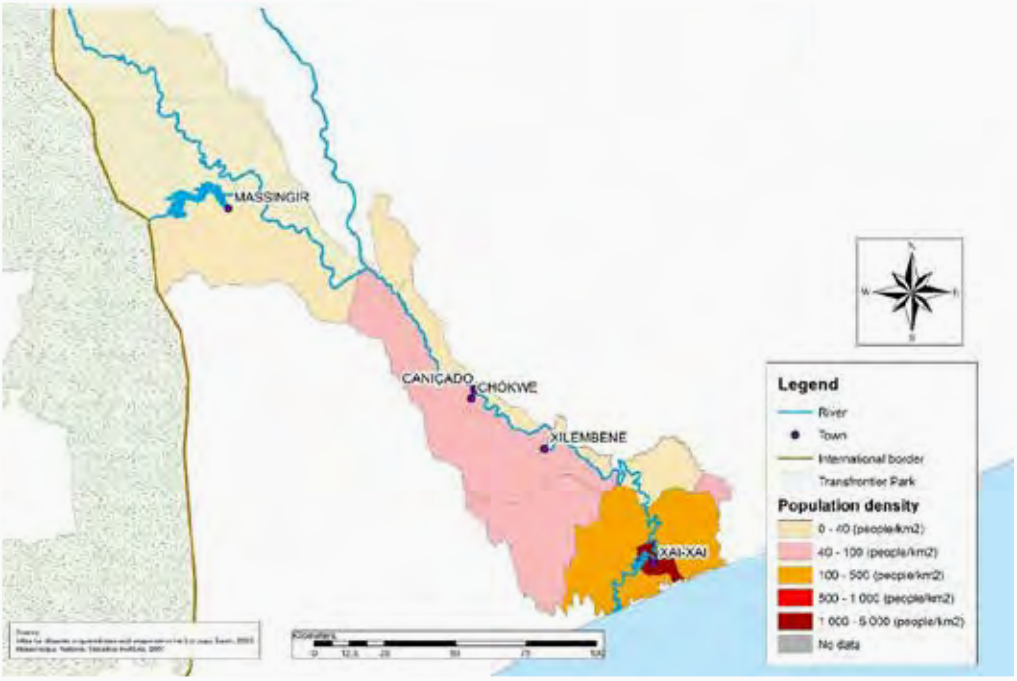
The total population for the catchment is estimated to have been 2.8 million in 2000, and is estimated to have grown to about 3.4 million in 2013 (700,000 in Mozambique; AWARD internal report). The study suggests that the impacts of climate change are likely to be expressed through: (a) increased temperatures and; (b) more severe climatic events. Areas of poverty combined with a high direct dependency on natural resources are likely to be the most vulnerable to climate change. The South African portion of the basin this coincides most directly with are the former bantustans or homelands, where the legacies of apartheid are still apparent in the high densities of people, high unemployment rates, variable income, and low literacy/ educational levels. Dependence on wood and non-piped water are also higher in these areas. Thus, resilience and vulnerability of livelihoods will be a focus in these areas.

Map of the South African portion of the ORB indicating population densities. The highest densities are found in former homeland areas (indicated by yellow boundaries)

POPULATION DENSITY IN THE OLIFANTS CATCHMENT IN SOUTH AFRICA



POPULATION DENSITY IN THE OLIFANTS CATCHMENT IN MOZAMBIQUE



Population density in the Mozambican portion of the Olifants catchment. The highest densities are found around the town of Xai-Xai and along the estuarine floodplain of the Limpopo River where small-scale farming is prevalent

The census data for South Africa (2011) were analyzed for dependencies on water. The table below provides an overall analysis of water sources for households of the ORB in South Africa. This suggests that over a quarter of the households rely on water sources other than that provided through bulk infrastructure. They are likely to most directly/ immediately experience the impacts of drivers of change (e.g. climate change) on water resources.

Water sources for the households in the Olifants River basin (South Africa) per sub-catchment (based on analysis of Census 2011; AWARD internal report).

Secondary Catchment	Regional/ local water scheme	Borehole	Spring	Rain water tank	Dam/ pool/ stagnant water	River/ stream	Water vendor	Water tanker	Other	Total
Upper Olifants	158 556	6 412	381	424	886	1 191	1 150	4 588	4 211	177 798
Wilge	67 500	4 587	201	233	304	406	1 018	3 228	2 154	79 632
Elands	163 022	12 192	942	1 697	3 745	4 407	11 841	8 847	8 441	215 135
Middle Olifants	107 137	20 021	4 263	3 170	9 296	17 281	8 991	4 351	4 209	178 718
Steelpoort	46 076	7 573	1 229	1 260	3 773	10 968	2 384	3 948	3 426	80 638
Blyde	5 891	1 198	159	106	636	3 930	242	324	339	12 824
Lower Olifants	72 350	9 947	1 522	1 347	7 396	12 791	5 086	3 446	2 672	116 558
TOTAL	**620 532**	**61 930**	**8 698**	**8 237**	**26 035**	**50 975**	**30 712**	**28 732**	**25 452**	**861 304**
Percentage	**72 %**	**7 %**	**1 %**	**1 %**	**3 %**	**6 %**	**4 %**	**3 %**	**3 %**	

Other areas of direct dependency on water for productive purposes include commercial agriculture, for example, around Loskop Dam through the Loskop Irrigation Board. Many farmers there are linked into markets in Europe, which have high-quality demands. Water quality issues in the Middle Olifants have major implications for their livelihoods, and highlight particular vulnerabilities. Equally vulnerable is a group of emerging farmers from the Lepelle Farmers Union, who occupy land neighboring that of the Loskop Irrigation Board. Their vulnerabilities are expressed as lack of access to water and poor access to markets.

Another area of vulnerability is the interplay between mining, land tenure, and water. This has implications for how RESILIM O works in the future, with approaches such as stewardship and water user associations. A number of communities in the Middle Olifants noted they are waiting for a finalization of land claims, but that the former owner had negotiated for mining without their approval. Mining-affected communities, therefore, are a major emerging theme of vulnerability as expressed through the Pushing Back Coal initiative that RESILIM O participates in.

Deepening our understanding of vulnerability by developing a participatory systemic understanding is a focus area of the 2015 work plan.

Future technical reports that contribute to this category will be featured in the 2015 quarterly reports. They are:

Technical Report Five: Mining as a key driver in the Olifants catchment

Technical Report Six: Land reform specifically related to land tenure reforms in South Africa

Technical reports regarding water security **and water governance for the Olifants catchment**

This collection of Technical Reports focus on integrated water resources management. In this report, we present technical reports that reflect work completed or in progress. The technical reports cover fundamental water-related assessments, such as a water balance for the catchment, an assessment of systemic water quality (a report on waste water treatment is to be included in subsequent reports), and a report on the nature and status of planning for environmental water requirements, including a discussion of methodologies for incorporating how these might secure ecosystems services in the catchment.

TECHNICAL REPORT SEVEN

A SYSTEMIC UNDERSTANDING OF THE STATUS OF WATER RESOURCES, AVAILABILITY, AND REQUIREMENTS, AND THE IMPACTS OF KEY DRIVERS OF CHANGE UNDER DIFFERENT SCENARIOS.

SUMMARY TABLE	
TITLE	**Water Balance:** A systemic understanding of the status of water resources and requirements, and the key drivers of change under different scenarios in the basin.
CONSULTANT	IWR Water Resources (Pty) Ltd - Chief consultant: Stephen Mallory
PURPOSE OF STUDY	Increase understanding of the status of water resources under different scenarios. To engage with stakeholder platforms in order to support the incorporation of resilience plans into institutions and strategies (so as to support adaptive capacities).
STATUS	**Work completed. The report includes:** Synthesis of the water resources situation within the Olifants catchment Estimate of future water requirements and water balance, assuming no development or expansion of the water resource Description (from a water resources perspective) of various proposed management and development options that will ensure a positive water balance into the future.

SUMMARY

This technical report highlights that the Olifants catchment is highly developed and water-stressed due to the intense utilization of the limited water resources by various sectors (IWR Water Resources (Pty) Ltd., 2014). The following water use sectors were considered in the water balance analysis: urban (domestic and light industrial); rural (domestic and subsistence farming water use in rural areas); irrigation; mining; industrial; power generation; and forestry. Large forest trees such as eucalyptus, pine and wattle (alien invasive plants) reduce runoff whether they are within a licensed commercial forest or not. The area under alien invasive plants within the Olifants catchment is estimated to be 2 262 km^2, and it reduces runoff by about 66 million m3/annum (DWA, 2012).

The intense water utilization in the basin consequently affects both water quantity and quality negatively, thereby affecting the catchment water security (Schreiner et al, 2009). Water security is the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies (Cook and Bakker, 2012). The water requirements in the Olifants basin have increased substantially over the last few years due to diverse activities; for example: mining; urban development; improved service delivery to rural communities; irrigation; power generation; and the need to provide the ecological water requirements (EWR).

The EWR is the quantity, quality and seasonal patterns of water needed to maintain aquatic ecosystems within a particular ecological condition, and it is afforded 100% assurance in the National Water Act (Act 56 of 1998) (DWA, 2006). Ecological Water Requirements are not considered to be a water use, since this is water that must remain in the river. Water for power generation at Arnot, Hendrina, Kendal, Kriel, Komati, and Matla power stations within the Olifants Basin, however, is imported either from the upper Komati or the Vaal Systems, which are outside the catchment. The potential future demand for water from the mining sector, as well as rural communities, with an allowance for demand water management, was large, and this led to the construction of the De Hoop Dam (approximate capacity of 348 million m^3), which was completed in 2013, as a supply-oriented strategy.

To understand where water shortages are likely to occur during droughts, now and in the future (IWR Water Resources (Pty) Ltd., 2014), the Olifants basin was subdivided into sub-catchments, and the water balance of each of these sub-catchments for 2014 is shown in the graph below. Current water balance was based on observed flows, while future water balance was based on stream flows from Water Resources Yield Model (DWA, 2010). Flow from the Letaba and Shingwedzi River was taken into account when determining the water balance of Olifants River within Mozambique (IWR Water Resources (Pty) Ltd., 2014). Five of the sub-catchments are in balance; five are in surplus, while four of them are in deficit. The future water balances for 2020 and 2030 were noted to remain relatively stable in comparison to the 2014 water balance, provided no drastic events or management options are implemented.

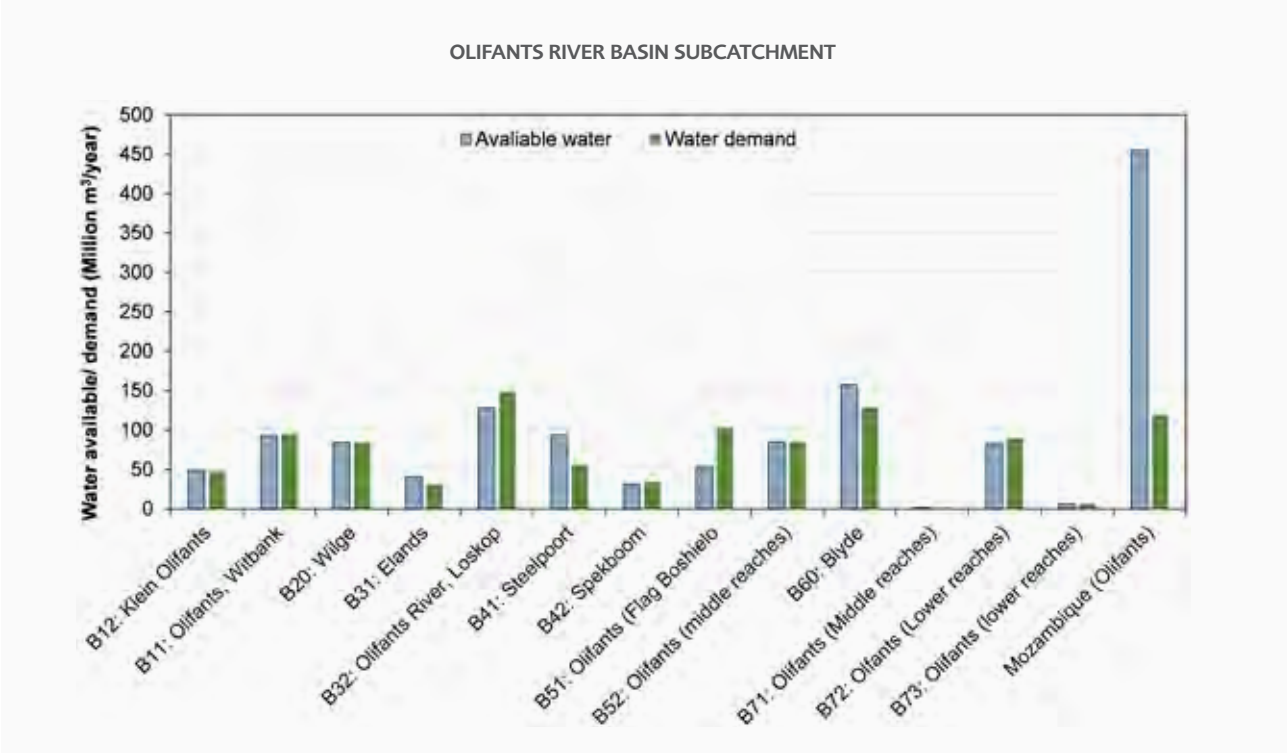
There are a number of large dams in the catchment which can meet the large water requirements under the current operating regimes. The EWR, however, is not being met or implemented. The implementation of the EWR will result in a deficit within the South African part of the basin. This deficit can be off-set by groundwater development (supply-oriented), and demand management strategies, such as more efficient water use, removal of alien invasive plants, reuse (use of treated mine decant water), and recycle, thereby increasing the water availability and security in the basin.

No comprehensive water resources analysis of the whole Olifants basin – including the Letaba tributary – has been done, hence there is some uncertainty associated with the Massinger Dam yield, which requires further study.

To conclude, since the availability of water either through demand or supply management strategies is one of the key elements that influences catchment resilience, it is therefore essential to understand the current and future water balance within the Olifants basin across all user sectors from a systems viewpoint. For instance, the availability of water to various sectors is influenced by upstream water use, and in some cases, downstream priorities of water supply.

These findings will be shared with stakeholders (including DWAS, Ara-Sul, and other river basin organizations). These water balance results can be used to trigger resilient water management options in the priority sub-catchments (those in deficit and in balance), currently and in future under climate change.

Water balance for sub-catchments in the Olifants basin for 2014



TECHNICAL REPORT EIGHT

LIVELIHOOD DEPENDENCIES AND VULNERABILITY IN THE OLIFANTS CATCHMENT

SUMMARY TABLE	
TITLE	Water Quality: a systemic and participatory understanding of water quality issues and practices in the basin.
CONSULTANT	Rhodes University – Professor Tally Palmer and Dr Neil Griffin
PURPOSE OF STUDY	Develop a participatory understanding of water quality issues and practices, and how they relate to resilience; and to build activity systems with stakeholders for the management of water quality that contribute to resilience of the basin.
STATUS	**On-going:** A systemic and participatory understanding of water quality issues and practices in the Olifants catchment The project is building, together with stakeholders, an understanding of practices related to water quality as input to understanding the management of water quality as a contribution to the resilience of catchment This work will be used in 2015 as an input to understanding the management of water quality as a contribution to the resilience of Olifants catchment

SUMMARY

Despite widely recognized water laws in South Africa, the quality of water in the country has been observed to be decreasing, and this has brought some focus on the challenges in managing water in the country. One major river that has drawn attention in this regard is the Olifants River, a major tributary of the Limpopo River, and one of the most heavily impacted rivers in Southern Africa. Major land uses in the catchment include mining, power generation, industry, agriculture (subsistence, dryland and irrigated) and conservation, along with growing human settlements and their requirement for water and waste management. Attention to water quality issues in the river has been raised by recent fish and crocodile deaths in the lower catchment.

Major impacts in the Olifants River have been identified, and include elevated sulphate and salinity levels attributed to mining impacts; elevated salinities associated with irrigation practices; pH levels that are often elevated, but also include classic acid mine drainage impacts; increased levels of orthophosphate and associated eutrophication in reservoirs; and the likely but generally un-quantified impacts of unmonitored or rarely monitored compounds that could be toxicants.

During the course of 2014 USAID: RESILIM O reported on spatial and temporal trends in selected water quality parameters at monitoring points across the catchment. Aspects of water quality that were assessed included orthophosphate levels, sulphate levels, salinities (as electrical conductivity), and pH levels, as these comprise major identified stressors in the catchment.

The first step was to identify trends in selected water quality parameters – using appropriate models – at all monitoring sites where sufficient data were available. This approach assesses medium to long-term changes after accounting for seasonal variation.

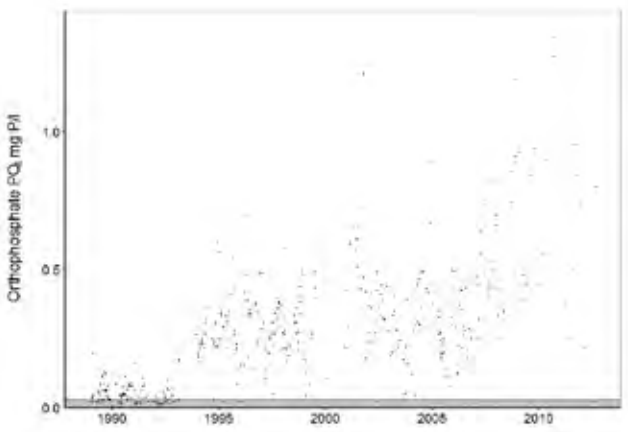
WATER QUALITY TRENDS

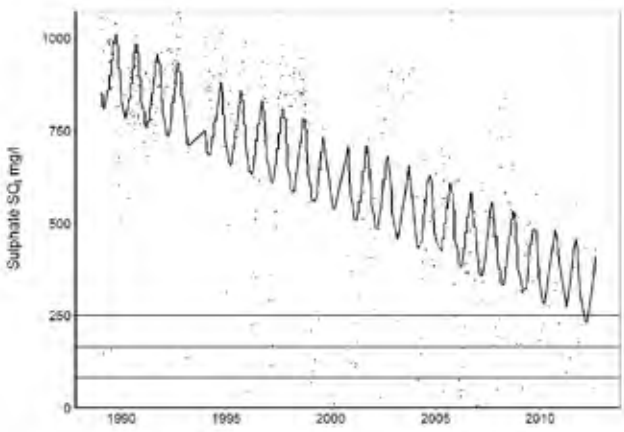
The upper catchment shows the considerable impact of coal mining, and has since the beginning of the data record. The quality of water in the river improves with distance downstream of the upper catchment, until the confluence with the Ga-Selati River, when the impact of the Phalaborwa mining-industrial complex decreases water quality again.

Population density in the Mozambican portion of the Olifants catchment. The highest densities are found around the town of Xai-Xai and along the estuarine floodplain of the Limpopo River where small-scale farming is prevalent

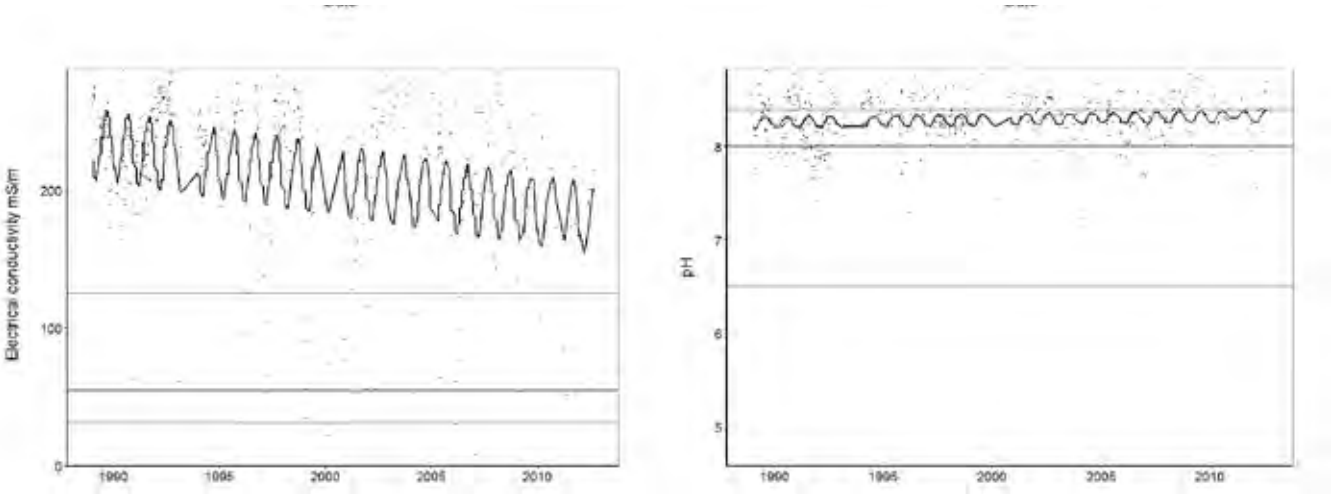
For example, site B7H019 is located low on the Ga-Selati River just prior to its confluence with the Olifants River. While much of the mid and upper Ga-Selati River passes through land dominated by agricultural use and nature conservation/ tourism with a minor mining presence, the lower part of the river passes through the town of Phalaborwa, and the associated copper and phosphate-mining complex located on the south-east side of the town. The data record from this site starts in 1989 and runs to the current day, although there are several short periods with few records. The dataset contains 488 records, and is presented below.

Temporal trends in several water quality parameters at monitoring point B7H019 at Loole/ Foskor on the Ga-Selati River. Points show water quality parameters against time. Horizontal lines show upper limits of DWA generic RQOs for the country (DWA 2011). [Trend lines were derived using a GAMM model.]





Temporal trends in several water quality parameters at monitoring point B7H019 at Loole/ Foskor on the Ga-Selati River. Points show water quality parameters against time. Horizontal lines show upper limits of DWA generic RQOs for the country (DWA 2011). [Trend lines were derived using a GAMM model.]



Orthophosphate levels at this site are extremely high and have increased over the monitored period. **Sulphate levels** at Loole/ Foskor have been identified as amongst the worst in the Olifants River catchment. The data presented above show a large improvement in sulphate concentrations. In a similar way, **electrical conductivity levels** at this point, identified as the worst of all the sites surveyed in our study, show a trend to improving with time. The improvement is not as great as that observed for sulphate. **pH levels** at this site do not change significantly with time, with a median of 8.3.

A SYNTHETIC VIEW OF WATER QUALITY

As the project moves into the second year, the focus will be on developing a synthetic view of water quality in the catchment. We will trace the narratives of different variables, and their connections with each other, and with natural resource-use practice. In this way we will link five water quality impacts with three main land surface activities. These relationships will be tracked down the river from the upper reaches into Mozambique.

IMPACTS ACTIVITIES	SALINITY	NUTRIENTS	MICROBIAL PLLUTION	SEDIMENTS	TOXICANTS: - PESTICIDES - METALS
URBANIZATION	X	X	X		
MINING	X (especially sulphate – which also causes acid mine drainage	X (e.g. mining phosphate)		(no data – we will need to infer from activities)	metals (worse in acid conditions – so linked to sulphate)
AGRICULTURE **- RANGELAND** **- DRYLAND** **- IRRIGATED**	X	X (but note where crops also use nutrients)		X X	X (pesticides)

TECHNICAL REPORT NINE

IMPLEMENTATION OF ECOLOGICAL WATER REQUIREMENTS IN THE OLIFANTS CATCHMENT

SUMMARY TABLE	
TITLE	Ecological Water Requirements and DRIFT (Downstream Response to Imposed Flow Transformations) in the Olifants catchment
CONSULTANT	Southern Waters and AWARD
PURPOSE OF STUDY	Increase understanding of social-ecological water requirements under different scenarios and drivers.
STATUS	**On-going. The work currently includes:** A general scoping of the stakeholder engagement process conducted and how stakeholders experienced and understood classification and more specifically the associated benefits. A collaborative understanding of water-related ecosystem services under different scenarios including climate change (i.e. residents and stakeholders together with scientists).

Ecological Water Requirements (EWR) (sometimes called Environmental Water Requirements) are not well-understood by the public. In fact, they are contested often as unnecessary, despite being the basis for peoples' livelihoods and well-being. Therefore, our approach is to conceptualize EWRs – together with stakeholders – as the benefits that people obtained from water-related ecosystem services. A central tenet is that if people understand EWRs and other water protection options, they are more likely to support these in practice. The work in 2014 has focused on starting to understand – with stakeholders – the impacts of change on water resources and hence peoples' livelihoods and the role of environmental water requirements. As noted earlier, this is because the link between changing water resources (quality and quantity) and livelihoods is through ecosystem services. The tenet is that, as water resources degrade, many ecosystem services will decline, which will impact negatively on livelihoods and render these more vulnerable. To this end, this study is the basis for a number of key activities.

Firstly, one aspect has been to understand Classification. The Classification process for each water management area in South Africa seeks to facilitate stakeholder decision-making in selecting management classes for different sections of the river in question. The study by DWS, entitled "The Classification of Significant Water Resources of the Olifants Water Management Area", was completed in 2013. Given the selection of classes at a number of stakeholder meetings at the end of the study, it must be assumed that stakeholders understand the concept of ecosystem services. Thus, a survey of key stakeholders' understanding of the Classification process was undertaken. Secondly, an approach known as WatRES was used to derive a collaborative understanding of water-related ecosystem services under different scenarios, including climate change. Thirdly, the holistic DRIFT model for relating changes in water resources to livelihoods through changes in ecosystem services is being developed, and tested in key areas for two important purposes: (a) so as to examine the impacts of different scenarios on ecosystem services and livelihoods and; (b) to compare the outputs with those of the Classification study. Finally, these outputs will be shared and discussed together with stakeholders (as part of the Resilience Assessment), so as to consider management options for climate change.

The following section provides a brief overview of progress.

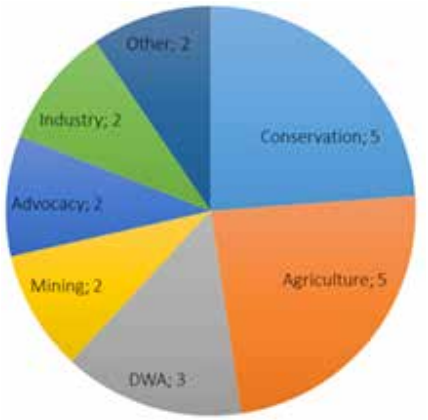
UNDERSTANDING OF CLASSIFICATION

Based on the findings from the survey, the majority of the interviewees thought that the public consultation was insufficient for a number of reasons, including: confusion about the process and technical language; and limited time to learn about and assimilate the information before providing input. Many concluded that stakeholders did not grasp the implications of Classification. Consultation was especially difficult in the Olifants because the Catchment Management Agency, which should facilitate the process, has not yet been established.

The interviewees also expressed concern about the size of the areas being classified (known as Integrated Units of Analysis), and the broad scope of only three Management Classes. The designations did not make upstream-downstream linkages in several cases; for example, some heavy-use sections flow into pristine stretches. Others thought the data was old, the economic modeling flawed, the scenarios inadequate, and the connection between the scenarios and Management Classes unclear.

Of the 13 responses, 12 people thought one group of participants could influence the process and outcomes more than another. John Dini, from SANBI, questioned Classification: "Was the way in which it was done, did it level the playing field, by way of allowing everyone to participate, with equal footing, and with an equal understanding?" The interviewees thought greater influence stemmed largely from strong personalities, resources, knowledge, and capacity, and that the process should be designed to take into account these differences. Representatives of the agriculture sector reported feeling threatened and thought that the process may favor mining. The perceived tension between sectors was quite polarizing.

Numbers of interviewees per sector



DEVELOPING A SYSTEMIC UNDERSTANDING OF ECOSYSTEM SERVICES AND LIVELIHOOD IMPACTS

While one of the priorities of RESILIM O is to build a systems view of the Olifants basin, it was decided at an early stage of the project to focus initially on a few specific areas, so that methodological or philosophical hitches could be dealt with, before expanding to a broader study area. Therefore, in order to test this approach, three start-up sites were selected, which consist of tertiary sub-catchments B32 and B71 within South Africa, and one site below the Massingir Dam in Mozambique. More specifically, these start-up areas are associated with the following Environmental Water Requirement (EWR) sites: IFR5 site within B32, IFR8 site within B71, and M-EWR-2 site in Mozambique

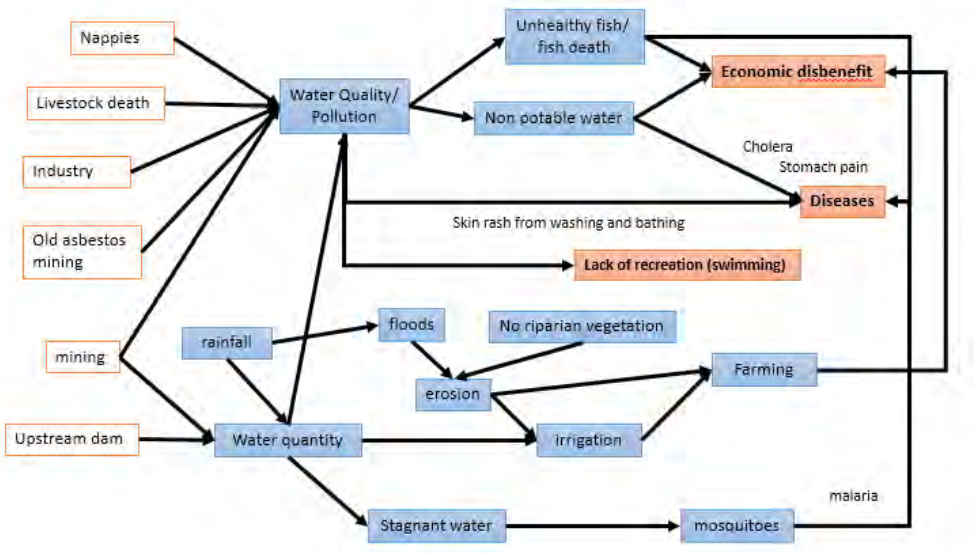
a) Participatory understanding of water-related ecosystem services (WatRes)

A detailed WatRes study was undertaken in the Middle Olifants area (B71) from July to September 2014, during which staff from DWAS joined the process. The study area lies along the main stem of the Olifants River downstream of Flag Boshielo Dam, which has changed flows of the river. Indeed, the river stopped flowing for nearly a month in 2006. It was an area of intense asbestos mining, which stopped in 1994. There is now an andalusite mine in the uplands. Communities are fairly isolated and depend heavily on water from rivers for fishing and subsistence farming.

The work involved a participatory action-research approach, where residents living along the river identified ecosystem services and benefits or dis-benefits under different scenarios through a systemic view. The results indicated that the full suite of benefits that residents previously enjoyed from water resources has been reduced severely due to mining, amongst other factors (the graph below). Participants highlighted the persistent negative impacts (dis-benefits) on health due to poor water quality, and the loss of fish resources for consumption, rendering livelihoods far more vulnerable than in the past. Superimposing the potential impacts of climate change (through increased temperature, decreased runoff and extreme events) is likely to exacerbate such vulnerabilities. These outputs will then be used within the DRIFT-DSS model, as described below.

Interestingly, communities in that area were unaware of changes to the National Water Act in 1998, nor of the possibility to interact in water resources management through catchment management forums (CMFs). The interactions therefore centered on action-research as a capacity development approach to increase awareness about institutional changes expected with the OLCMA, and the fact that CMFs would be established. This was endorsed by both the DWAS representatives, who spoke on a number of occasions and asked for support in the CMF establishment process.

Systemic representation developed by participants from B71 sub-catchment to describe the current state of the Olifants River and the impact this has on their well-being. Key dis-benefits identified were health-related impacts and economic.



b) The holistic DRIFT-DSS

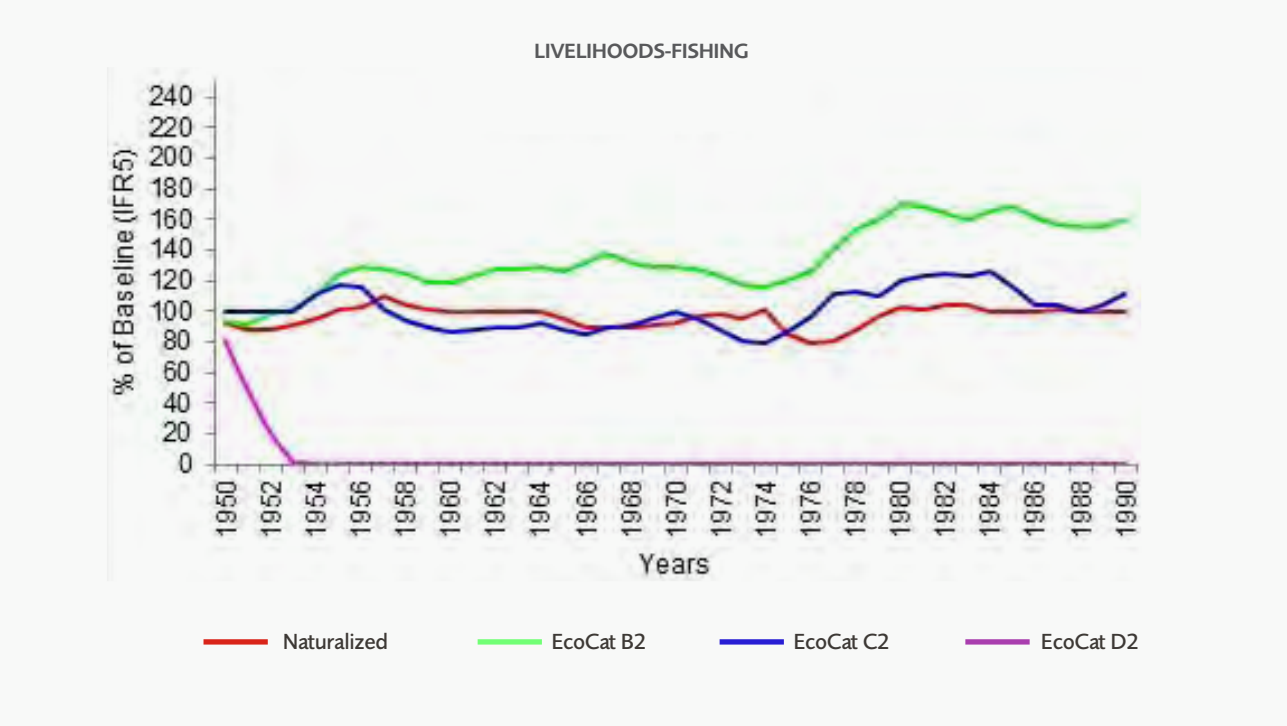
Southern Waters was contracted to capture and integrate relevant information from the livelihoods, ecosystem services and risks (climate change and other) assessments to populate a DRIFT-DSS (decision-support system), and then to use the DSS to predict likely impacts of flow-related scenarios on the riverine ecosystem, and its services and benefits.

The first piece of work was a literature review in order to collate relevant information from reserve determinations (e.g., DWAF 2001a, b and c), ecosystem services and valuation (e.g., DWAF 2001d, DWA 2010a) and Classification (e.g. DWA 2012) studies undertaken in the Olifants basin since 2000, and to identify studies and data that will be used to inform the DRIFT model.

In terms of progress, a draft calibration has been done for both sites: IFR5 and 8. Finalization of both awaits finalization of the hydrology and the inclusion of the necessary WatRes information into the DRIFT-DSS.

The graph below provides an example of the outputs of this work, with the graph showing the percentage deviation from baseline ("pristine") conditions. In this example, outputs indicate that, whilst fish stocks contribute to peoples' livelihoods under Classes B and C (some acceptable change), and naturalized flows ("pristine" conditions), when the Ecological Class decreases to a D, fish stocks collapse with concomitant impacts on livelihoods.

Time-series (hypothetical) of the consequences of the four flow regimes on fish catches / livelihoods from fish.



In the coming year this data will be compared to Classification outputs for use in alternative modeling processes (DRIFT), and a systemic modeling platform to explore the potential for understanding EWRs systemically under different scenarios (including climate change). These outputs will be shared and discussed with stakeholders (as part of the resilience assessment), so as to consider management options for climate change.

Technical reports regarding biodiversity, conservation, and **protected area management in the Olifants catchment**

This section presents technical reports dealing with matters related to biodiversity, conservation and protected area management. Reports include matters of institutional arrangements and governance; protected area effectiveness; evaluative instruments for adaptive management; mechanisms for protected area expansion; and biodiversity stewardship programs for local governance structures.

TECHNICAL REPORT TEN

GOVERNANCE AND INSTITUTIONAL ARRANGEMENTS FOR BIODIVERSITY CONSERVATION IN THE OLIFANTS CATCHMENT

SUMMARY TABLE	
TITLE	**Governance and oversight of biodiversity conservation in the Olifants catchment**
CONSULTANT	University of Pretoria - Onderstepoort , University of the Witwatersrand (Animal and Plant Ecology), SANParks and Pegasys
PURPOSE OF STUDY	Increase understanding of governance/ institutional arrangements for protected area management and conservation for the Olifants catchment
STATUS	**On-going** Results are due in the next quarter.

SUMMARY

This is a set of studies guided by the question: What are the consequences of different institutional arrangements, and what configuration of institutional arrangements is required to promote resilience?

The study highlights the limited understanding of the complexity of biodiversity conservation, and the kind of challenges that public entities and institutions face in this regard. The host of governance-related impediments to achieving biodiversity conservation contribute to under-funding of public entities responsible for biodiversity conservation. Some of the statutory conditions regulating biodiversity, as well as approaches to measuring performance, limit the allocation of resources necessary to achieve them and constrain effective reporting. Laws and policies to protect biodiversity, as well as monitoring and reporting, need to be subject to adaptive review (Ruhl 1997). New regulations on protected area management effectiveness do require annual reporting, but such reporting will be of value only to the extent to which the reports are used to systematically analyze the effectiveness of the regulations and policies.

This report explores the various institutional arrangements from parliamentary intergovernmental forums to local government planning instruments likely to play an important role in building resilience in the Olifants catchment. For example, Section 9 of the Intergovernmental Relations Framework Act (Act number 13 of 2005) allows for the establishment of a national intergovernmental forum, which is a consultative forum for parliamentary members. The purpose of a national intergovernmental forum is to raise and discuss matters of national interest with provincial and, where appropriate, local government.

Despite these forums, conservation endeavors are hampered at all levels by many challenges. The study found that impediments to biodiversity management express themselves at a local level. Budget shortfalls are widespread. Government spending priorities focus on poverty, housing, health care, basic education, sanitation, and crime prevention. Funding for biodiversity is allocated only after these objectives are met. There is often limited understanding of the concept of biodiversity. Often, it is seen as a "socially unjust endeavor, disrespectful toward people, and lacking realism" (Wilhelm-Rechmann and Cowling, 2011). Treasury cannot consider appeals for more funding, particularly as there is a widespread failure to set targets and report against them. This failure to meet targets has much to do with the measurement systems used, which do not take into consideration local challenges.

SUPPORT FOR LOCAL GOVERNMENT

Municipal Spatial Development Frameworks are key for land-use decision-making. It is critical, therefore, that the spatial development framework incorporates the best available environmental and biodiversity information into the spatial planning process. USAID: RESILIM O was requested to provide appropriate spatial biodiversity and environmental information for inclusion into Maruleng's spatial development framework. It was found that numerous biodiversity and environmental issues potentially can be incorporated into the spatial planning process. We have focused on a number of key context/ information layers, and on the two key biodiversity/ environmental layers. **The biodiversity/ environmental layers incorporated are as follows, with the two key integrative layers highlighted:**

Protected Areas and Conservation Land Use – key layer (see land use map below)

Critical Biodiversity Areas and Ecological Support Areas from the Limpopo Conservation Plan – key layer

Limpopo Protected Area Expansion Strategy

Threatened Terrestrial Ecosystems

Strategic Water Source Areas

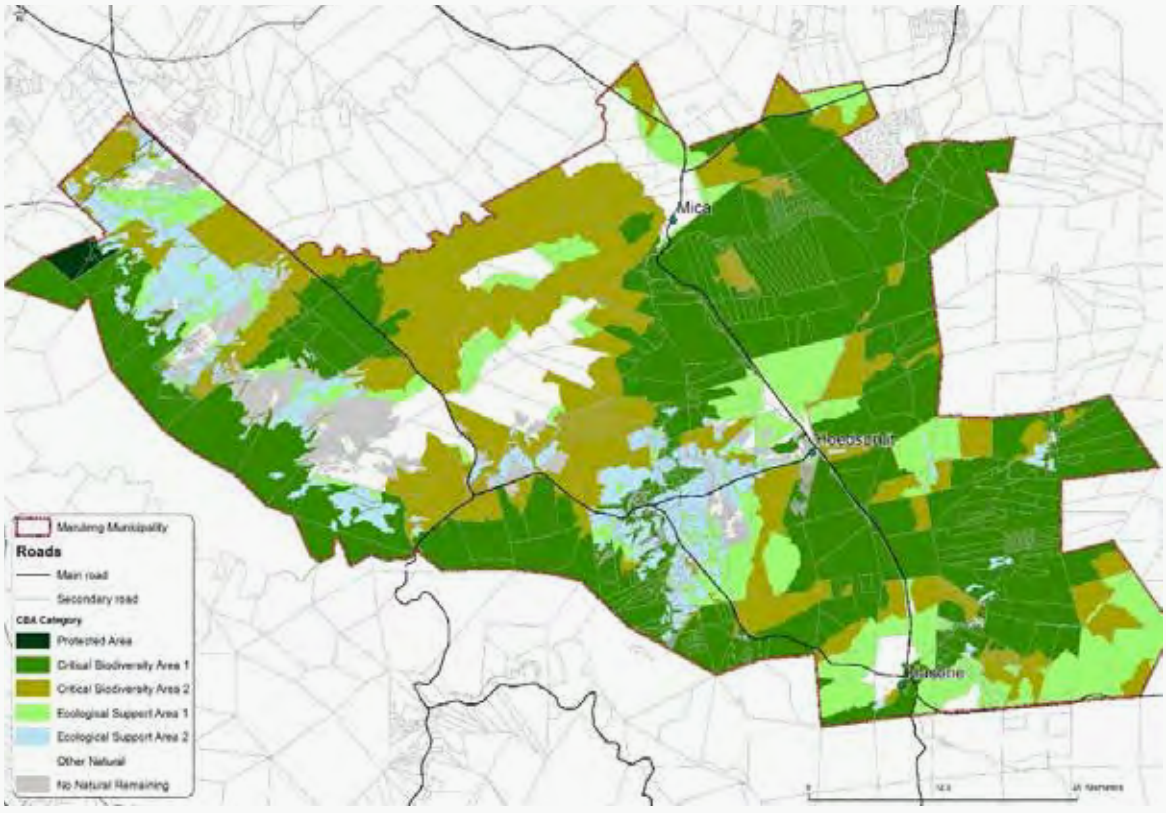
Areas Supporting Climate Change Resilience (see map below)

National Freshwater Ecosystem Priority Areas

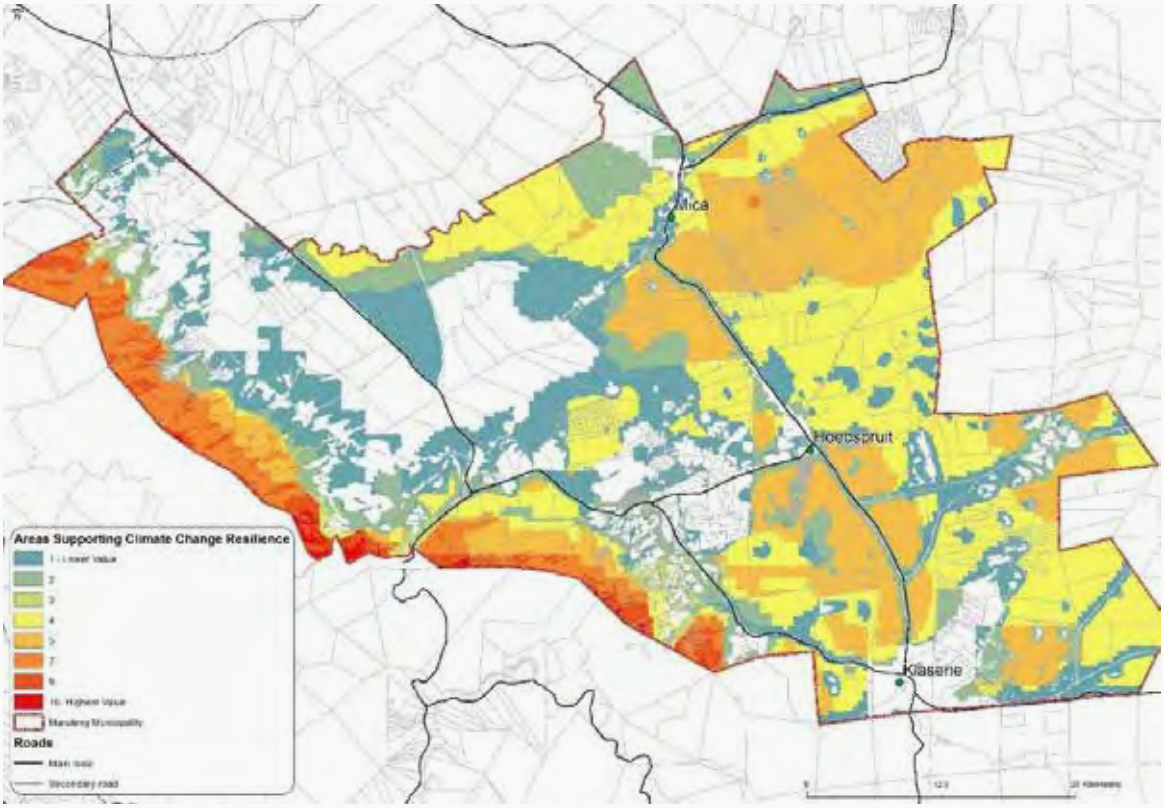
Kruger to Canyons Biosphere Zones

Agricultural Potential

Map of the Limpopo Systematic Conservation Plan priorities, developed for the Maruleng SDF.



Map of areas support Climate Change Resilience, developed for the Maruleng SDF.



RESILIM O is exploring, through appropriate institutional alignment, ways to provide the necessary support to attain the objectives within the Maruleng SDF, Disaster Risk Management Plan and Local Economic Development Plan. RESILIM O, in working collaboratively with the Global Environmental Facility Protected Area Program, GEF Small Grant Program, and the Biodiversity Social Projects Land User Incentives, will seek further alignment between the respective municipal processes and plans, and the development and implementation of relevant environmental plans (e.g. bioregional plan) and associated socio-economic beneficiation plans pertaining to important natural resources. RESILIM O is providing institutional support by introducing adaptive management and planning processes.

TECHNICAL REPORT ELEVEN

PROTECTED AREA MANAGEMENT EFFECTIVENESS

SUMMARY TABLE	
TITLE	Protected area management effectiveness
CONSULTANT	AWARD with S. Holness and Agricultural Research Council (ARC)
PURPOSE OF STUDY	Developing appropriate evaluative processes to improve management effectiveness for protected areas and stewardship.
PURPOSE OF STUDY	**Work on-going** **Spatial overview of the protected area network at catchment level:** Status quo report around protected areas and stewardship network Framework for institutional coordination in collaboration with conservation agencies and reserve network, to better direct Stewardship Priorities, and understand the status quo and value of the protected area network Inform the institutional, conceptual and strategic approach to ensure GEF PA sustainability First draft of the status quo of PA network developed in the Maruleng Local Municipality Developed beneficiation framework with regard to the Wildlife Economy in collaboration with various partners and programs (RESILIM B, SANParks, GEF SGP partners, K2C, etc) Overview of current management effectiveness planning by different PA stakeholders, and process to better inform this Developed classification framework for determining the status quo of the protected area network – legal status. This evaluates classification mismatches from local to national level, and informs the spatial data set at provincial and national level Stakeholder workshop reports (co-developed with relevant agencies and partners) and initial synthesis of key issues constraining PA management effectiveness

SUMMARY

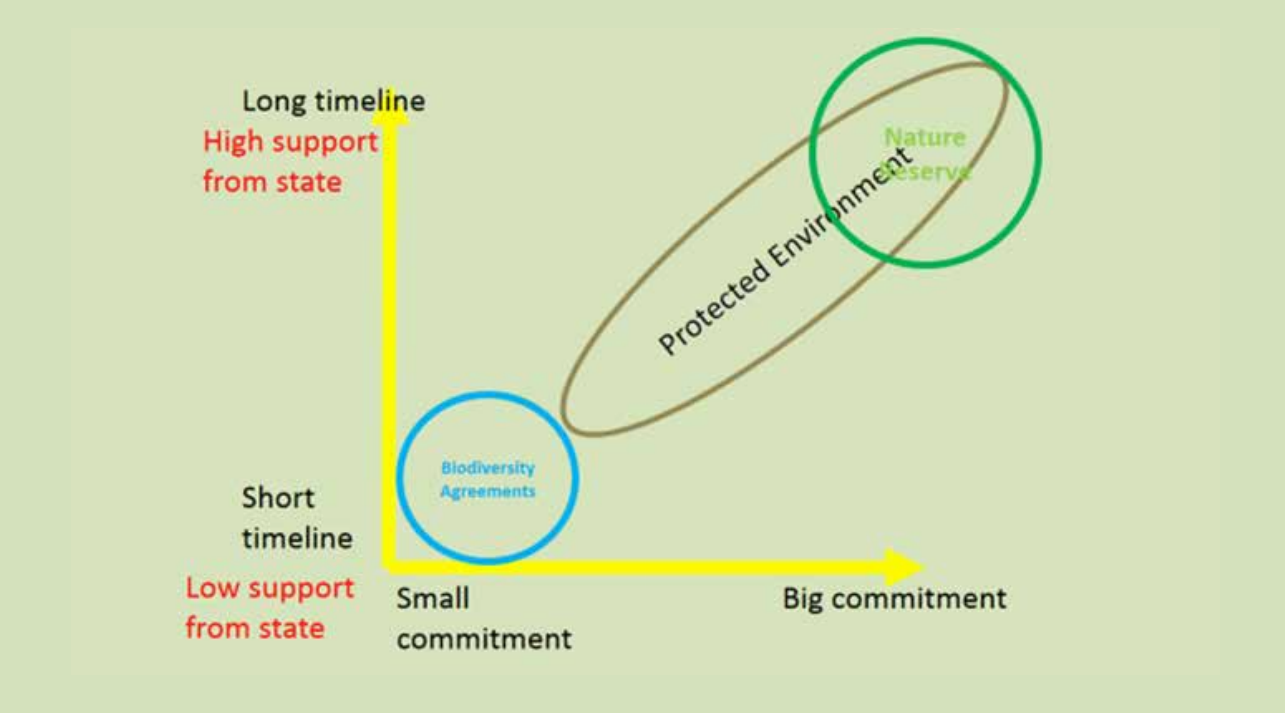
This technical study aims to understand the appropriate evaluative processes for improved protected area and stewardship management at a catchment level, with a special focus on resilience. Firstly, it explores the current status evaluation of management within the protected areas network within the Olifants catchment (for example, are targets aligned with provincial and national governments, and what are the legal and evaluative mechanisms to ensure governance?); and, secondly, to assess whether protected areas do contribute to resilience with a particular focus on vulnerable communities.

Understanding the status quo of the protected area network in the Olifants catchment is essential in order to best inform which protected area and stewardship models could help to secure important biodiversity and ecosystem services, and associated livelihood dependencies (see figure below). The METT-SA tracking tool has been designed to measure management effectiveness of these protected areas, but very often the context within a socio-ecological system is understood poorly, resulting in inappropriate management-effectiveness evaluations. Most often, strategic adaptive management principles are not applied. The METT-SA also has many limitations and protected area management plans do not more adequately address buffer issues.

Additionally, the study found that many of the indicators in the protected area norms and standards are qualitative and very subjective. This is a drawback in view of the general concern regarding the accuracy of measures of protected area effectiveness (Cook and Hocking 2011). It also does not deal adequately with buffer zones and does not allow for a systemic evaluation at protected area network level.

Another major finding is that there is a mismatch between what national/ provincial authorities and landowners regard as the status of protected area registration. Many protected areas, especially privately owned areas, are not formally proclaimed. The land tenure of some formally proclaimed areas, too, has changed. The status of many of these areas needs to be verified through ground-truthing, and through title deed searches.

Different models, depending on conservation objectives and ownership models, that could be informed by the protected area status quo report



Formal and informal protected areas in the Olifants catchment – the status of many of these areasneeds to be verified through ground-truthing and through title deed searches.

Table 3. Area in hectares of formal protected area and private reserves for each geographical area of the Olifants. However, information needs to be ground-truthed to verify accuracy.

	Formal Protected Area	Private Reserves	Outside any reserve	Grand Total
Lower Olifants	362091	327278	572157	1261526
B60	37365	28523	218711	284598
B71	523	1192	64715	66431
B72	46593	134278	264570	445441
B73	277610	163285	24161	465056
Middle Olifants - Agriculture	69196	6369	1043816	1119381
B31	25775	6369	576587	608731
B32	43421		467228	510649
Middle Olifants - Sekhukhuneland	78351		1140033	1218384
B51	17166		607222	624388
B52	17617		335643	353259
B71	43568		197168	240737
Middle Olifants - Steelpoort	9661	9582	693742	712985
B41	3393		501576	504969
B42	6268	9582	192166	208016
Upper Olifants	1772	8346	1136390	1146508
B11	889		470995	471884
B12			239112	239112
B20	883	8346	426283	435512
Grand Total	**521070**	**351576**	**4586138**	**5458785**

The number of hectares and percentages of land under protected area status are represented in table XX. It is now clear, however, that these figures need to be verified, as many of these areas that are recorded as protected areas do not have any formal status.

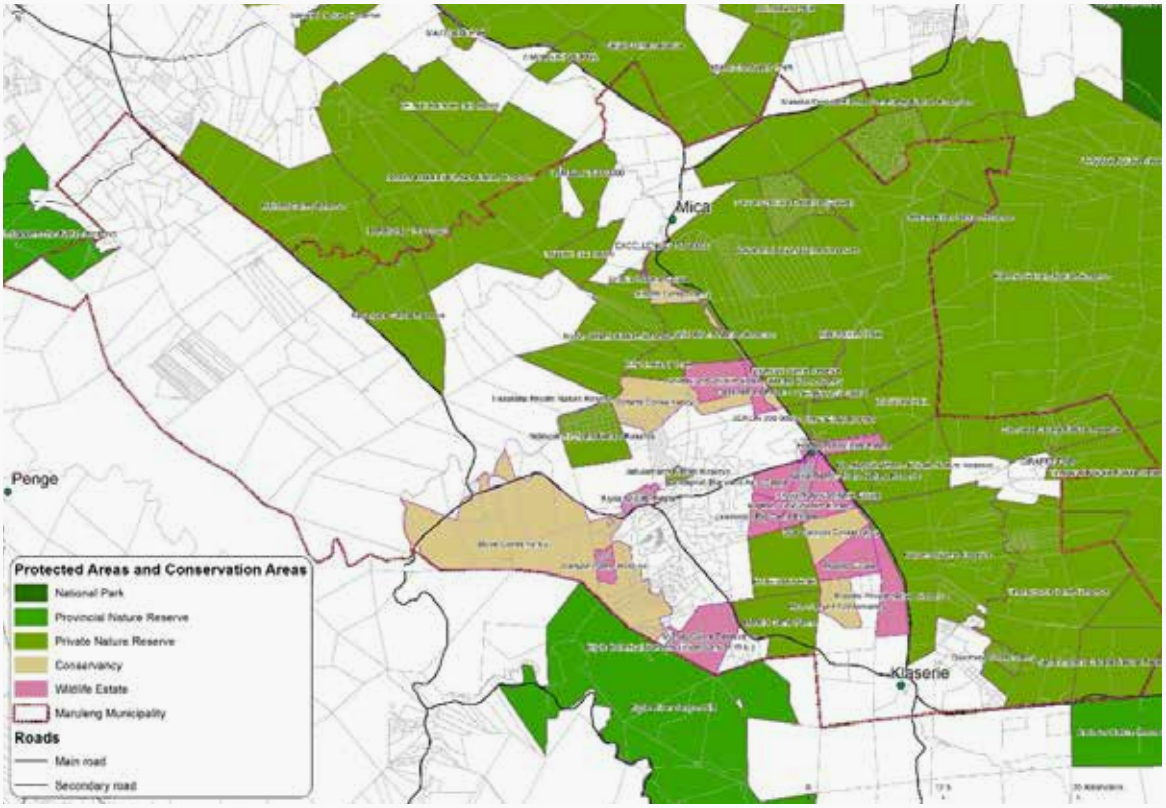
What we currently know is that there is a poor representivity, and uneven distribution of protected areas in the catchment results in the bulk of the catchment consisting of under-protected systems with the majority of the habitats falling into either the poorly protected class (approximately 39% of the catchment), with approximately 31% of the catchment having no significant level of protection and being classified as not protected. Only 8% of terrestrial habitats in the Olifants catchment are well-protected and 22% moderately protected.

The Lower Olifants is extremely well-protected in comparison with under 1% of the habitat types by area having no protection, and the majority of the habitats having at least some level of protection. In stark contrast, the terrestrial habitats of the Upper Olifants consist of approximately 94% of not-protected types. Similarly, the Middle Olifants areas all have low levels of well-protected habitats and are mostly only partially protected, with a smaller amount moderately protected (the table above). Of the Middle catchment, the Steelpoort unit has the highest portion of habitats which are not protected (47 %). Figures for Mozambique are unavailable at the moment.

The protected area system in the Olifants is very skewed towards the Lower Olifants (excluding Mozambique), with extremely poor representation of Upper and Middle Olifants habitat types. There is a clear need for re-focusing stewardship and protected area expansion strategies in the catchment.

Integration of protected areas with spatial development plans is a work being piloted in the Maruleng Municipality. This work is in progress, but preliminary findings have informed the Maruleng Spatial Development Framework (the map below) already, by developing more accurate layers on the conservation status of protected areas in the region, and the buffer of the Kruger National Park, which is important for the implementation of the National Buffer Zone Strategy, implemented by the GEF Protected Area Program, and coordinated by SANParks and the Lowveld Protected Area Steering Committee.

Improved spatial layer of the protected area network within Maruleng Municipality, as informed by an initial scoping exercise. This layer has been incorporated into the Maruleng SDF.



TECHNICAL REPORT TWELVE

INTEGRATING LAND-USE PRACTICES, LIVELIHOOD SECURITY, AND ECOSYSTEM SERVICES INTO GOVERNANCE STRUCTURES

SUMMARY TABLE	
TITLE	Priority ecosystems and species: integrating land-use practices, livelihood security, and ecosystem services into governance structures.
CONSULTANT	AWARD in association with various strategic partners such as SANParks Biodiversity social projects
PURPOSE OF STUDY	To identify priority ecosystems and species, and understand how different land-use practices affect the provisioning of various ecosystem services. This includes identifying appropriate indicators for land-use practices, and incorporating the value of biodiversity and ecosystem services into traditional governed communal lands.
STATUS	Ongoing

SUMMARY

This body of work is guided by the question: Can multiple, stakeholder-developed criteria help to develop a more systemic understanding of biodiversity within a broader natural management resource context? The aim is to develop a systemic understanding through participative processes of natural resource management and its associated practices within the catchment, and explore with local communities how these practices can contribute to a more resilient catchment. This includes identifying priority ecosystems and species, and different land-use practices; identifying appropriate indicators for land-use practices; and incorporating recognition for ecosystem services into traditional governance structures.

One study is investigating a land-user incentives restoration project in the Mametja area, which is based in one of the priority clusters for the USAID: RESILIM O project. The project aims to develop the capacity of communities to restore and manage communal rangelands, streams, riverbanks, and surrounding areas. The restoration of the land will reduce the risk and vulnerability of people, particularly with regard to extreme events associated with climate change. This project is being implemented by SANParks Biodiversity social projects, and staff from USAID: RESILIM O. Work until now has been focused on summarizing currently available information on natural resource uses and livelihoods of residents in the area, as well as traditional governance arrangements around the Mametja area (see map below). This preliminary work is showing that a key driver in the area is also a need for waste management.

Map showing the location of the Mametja area, within the Olifants River basin. Four villages within the Mametja area were chosen for the project based on a survey of the level of pollution and land degradation across the area. The villages are Finale, The Oaks, The Willows and Mabins A.