



Photos: Japie Buckle

## Water for Food and Ecosystems in the Baviaanskloof Mega Reserve

Part of PRESENCE in the Baviaanskloof:  
an integrative catchment restoration program

Narrative report on the activities in 2009 of the Water for Food and Ecosystems Project  
in the Baviaanskloof Mega-Reserve  
financed by the Government of The Netherlands



livinglands

## 1. Introduction

This narrative reports on the activities carried out in 2009 as part of the Water for Food and Ecosystems project financed by LNV/OS. The financial report has been submitted separately.

This report is based on the proposal and work plan and the activities in the work plan accordingly.

The Water for Food and Ecosystems in the Baviaanskloof project is being coordinated by Living Lands. Living Lands is a South African Not-for-Profit -Organisation with the vision of reversing degradation and guiding the restoration of 'living landscapes'. "Living 'landscapes' exhibit a variety of healthy ecosystems and land-uses and are home to ecological, agricultural and social systems which are managed in such a way that they function sustainably. This ensures that natural and cultural resources are available for future generations. To be able to create living landscapes, Living Lands believes it is crucial to develop and create locally driven learning networks which facilitate knowledge and experience exchange, trust building, mutual understanding, collaboration and compassion. At the moment, Living Lands main focus area is the Baviaanskloof Mega-Reserve. One of the primary activities of Living Lands was/is to setup and facilitate the PRESENCE learning network.



PRESENCE (Participatory Restoration of Ecosystem SERVICES & Natural Capital in the Eastern Cape) is a collaborative learning network aimed at guiding regional ecosystem management and the restoration of 'living landscapes'. Collaborating organisations are forming mutually beneficial partnerships and building synergies to enable social-ecological restoration in key areas of the Eastern Cape. The network currently consists of: national and international governmental departments and ministries; universities & research institutes; implementation agencies; and non-governmental, private and community-based organisations. An overview of all the partners can be found in the Annex i.

This transdisciplinary initiative is being piloted across the Baviaanskloof Mega-Reserve with the support of multiple partners. "PRESENCE in the Baviaanskloof" has been applying and refining an integrated ecosystem (services) approach. The process has involved area identification (e.g. hydro/ecological processes, stakeholder willingness, institutional capacity) and understanding perceptions and values of ecosystem/landscape services. PRESENCE in the Baviaanskloof is now in an early implementation phase which includes analysis of opportunities/constraints and strategy development. The Water for Food and Ecosystems project is an integral part of PRESENCE in the Baviaanskloof.

Restoration activities currently include: reforestation with native vegetation (CO<sub>2</sub> capture); water retention measures and recreating wetlands (increase base flow); erosion mitigation; and creating effective communication and education strategies for implementing an incentives scheme (e.g. PES) for ecosystem management. Collectively, such actions should continue to build social-ecological resilience to anticipate climatic changes.

## 2. Project goal

As described in the proposal and work plan of the Water for Food and Ecosystems project the main project goal is:

*“a general goal of the project is to implement water retention measures in the Baviaanskloof in order to enhance biodiversity and reduce erosion, and to possibly increase water availability for (downstream) water use for agriculture and drinking water supply. Furthermore, assist the process of conversion to ecotourism and ecosystem services for farmers and landowners and support the management of the Nature Reserve by the Eastern Cape Parks board.”*

As mentioned previously, the Water for Food and Ecosystems project is part “PRESENCE in the Baviaanskloof”: a integrated catchment restoration programme. The aim of this programme is: Guide the socio-ecological restoration of ‘living landscapes’ in the Baviaanskloof Mega-Reserve. Through a holistic approach that sustains healthy ecosystems, stakeholder participation, economic viability, social values, biocultural diversity and institutional feasibility whilst empowering pro-environmental behaviour to support resilient and sustainable rural livelihoods.

## 3. Reporting of the activities

### 3.1 Restoration plan

An integrated catchment restoration programme has been developed. The restoration of the Baviaanskloof consists of:

1. restoration of alluvial fans
2. restoration of the main river bed
3. restoration of the slopes by planting spekboom

The restoration of the main river bed is not part of the Water for Food and Ecosystems project.

The restoration of the alluvial fans, i.e. the rehabilitation of tributaries stream involves the closure of the channels which currently deviate the water directly into the main river, and the removal of keurwalle (berms) thus re-opening the natural water ways: this will allow water to again flow over the floodplain, feeding the present dried-out state of the land and returning the deposition of silt to the floodplains . According to various experts and implementing agents, this kind of intervention is likely to yield excellent results and to release significant pressure from the system, since it would slow down the water flow to a great extent (De Paoli, 2009).

Experts have been consulted on the restoration of alluvial fans. This has been done in cooperation with Rhodes University (RU), Gamtoos Irrigation Board (GIB) and landowners/farmers. Two RU Honours field trip and three honours theses where organised to gather more data and insights around the restoration efforts. Some of the results assisted the selection of two restoration sites as well as improved understanding of what implementation measures need to be taken and why. These sites are described in a restoration plan. See the Annex ii for one of the restoration site . GIB has been financed and equipped to make a civil engineering plan needed for the restoration of the alluvial fans.



the alluvial fans



the slopes

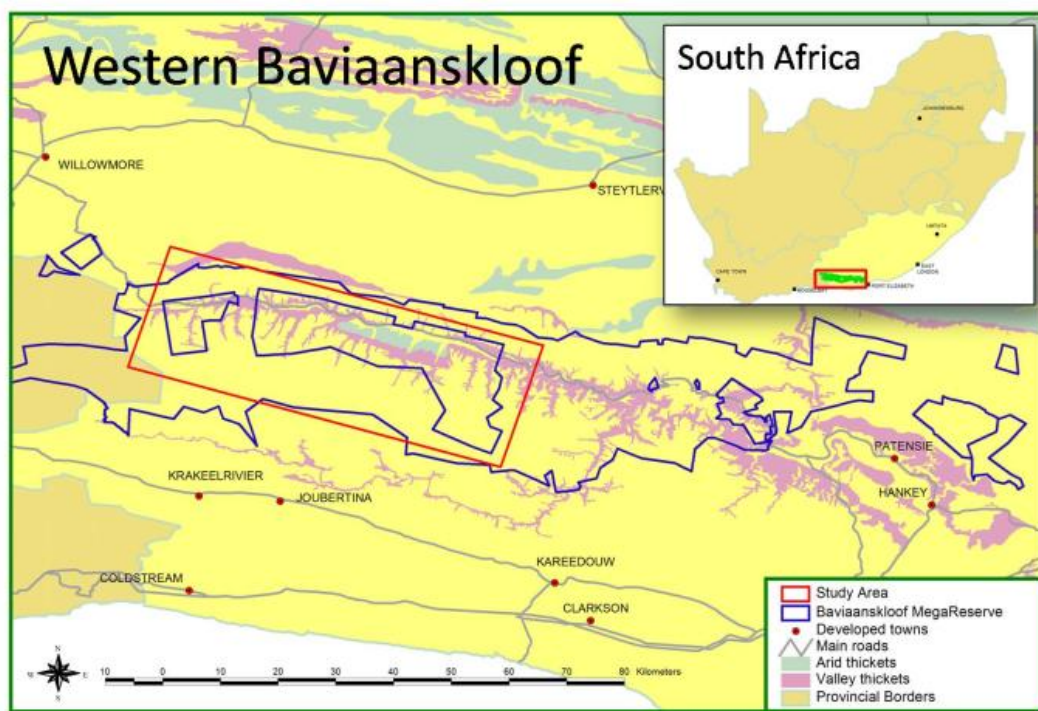


the main river bed

Initially it seemed that a basic Environmental Impact Assessment (EIA) was needed. To obtain the EIA, a tender procedure has been set up and a quote received. During this procedure, it became clear that an EIA was probably not a prerequisite after all. Consequently, a letter has been prepared for the Department of Water Affairs (DWA) to approve the waiver of the EIA.

The loss of vegetation cover over large areas of the catchment puts a lot of pressure on the river system because of the high runoff and poor infiltration rate. Replanting projects by planting spekboom aim to retain water and reduce erosion while simultaneously restoring the indigenous vegetation cover. This does not only reduce pressure on the local system, but also has a positive impact internationally by sequestering large amounts of CO<sub>2</sub><sup>1</sup>.

For the reforestation of slopes, a detailed restoration plan has been set up, in cooperation with RU, Alterra, GIB, and DWA through the Working for Water/Woodlands programme. The detailed plan is included in the Annex iii.



### 3.2 Implementation of measures

After stakeholders and local ‘champions’ (i.e. willing and motivated land owners) were identified and consulted, Living Lands and PRESENCE partners focused on involving and empowering stakeholders to engage in restoration. This progress has led to a mindset change and interest of stakeholders in restoration, which eventually led to the permission of stakeholders to implement the restoration measures on their land.

To secure the spekboom reforestation investment over the long-term, stock grazing will not be permitted on the pilot plots for at least 10 years. A formal contract has been drawn and signed, between landowners/farmers, Eastern Cape Parks (ECP) and Living Lands for this replanting of spekboom. An important additional goal was also achieved through this process: first steps were taken in improving the current fragile relationship between farmers and ECP.

GIB has been financed and equipped with sufficient resources for executing the above mentioned implementation measures in four pilots in phases. The first two pilots i.e. replanting spekboom have been finalized. The implementation for the alluvial fans is in progress by GIB.

<sup>1</sup> Dutch and Belgium media attention for the CO<sub>2</sub> part of the project on “NOS Journaal, 28 November”, “VRT-Journaal, 2 December 2009”, “Trouw, 28 November 2009”, “De Standaard, Friday 11 December 2009”.

### 3.3 Operational monitoring system

During the start of the project, various local (RU, GIB, South African National Biodiversity Institute (SANBI), DWA, ECP, Nelson Mandela Metropolitan University (NMMU) and SU) and international (WUR/Alterra) experts/partners were consulted around the objectives, strategy and requirements of the monitoring program.

The main objective of the monitoring is to analyse the effects of the restoration on ecosystem services. The quantification of the effects of restoration are fundamental and crucial to the development of a Payments for Ecosystem/ Watershed Services scheme. Main ecosystem services are water retention, carbon sequestration, rising water table, increased base flow and soil retention. The monitoring comprises the entire collaborative restoration interventions by all PRESENCE partners. These consists of 1. Hill slope restoration (spekboom planting) 2. Alluvial fans 3. Wetlands/river restoration.

A monitoring plan has been prepared, see Annex iv deliverables. The strategy of the monitoring is to be able - ultimately - to assess:

- (cost-)effectiveness of measures;
- adjust measures if unwanted impacts are reported;
- generate information for up-scaling of the proposed restoration measures;
- evaluate impacts on the biophysical system; and
- generate information for the application of restoration measures in other catchments where similar problems are experienced.

The data will as well be used – finally - to quantify the benefits of ecosystem services. This will ultimately generate information for financial schemes, for example “Payment for Ecosystem (watershed) Services” (PES).



After defining the objective and strategies , Living Lands looked at developing partnerships to ensure the monitoring program is useful for different partners within the programme. The data collected through the monitoring program will not only be useful for this programme but also for the DWA funded Working for Water Programme, SANBI’s Working for Wetlands and for several South African and Dutch PhD and Master students.

Various equipment has been identified and purchased. The installation of the equipment will be done by GIB and a local contractor . Stakeholders such as the (community) farmers will fully participate in the monitoring. The reason behind this is that it is hoped that stakeholders will foster a sense of responsibility for the equipment, ownership for the initiative and will ultimately see and experience the effects of the intervention first-hand. The concept has so far been embraced by the stakeholders. Living Lands has employed and started training a motivated community member from the Sewenfontein (community farm) to become a research/field assistant and educator. He will be empowered to collect and progress the monitoring data.

## 4. Research

### 4.1 Scoping study PES. Incentives for sustainable management, PES schemes.

Research is carried out in the framework of four project phases (as described in PRESENCE in the Baviaanskloof: Integrated Catchment Restoration programme planned by the PRESENCE network, 2009):

1. Social Phase: a continuous process of increasing social capital by building trust, willingness and creating a shared vision for engaging stakeholders and mainstreaming restoration;
2. Assessment Phase: creates a better understanding of the biophysical, socio-cultural and economic functioning of processes and values in the Baviaanskloof Mega-Reserve before and after restoration, and, with this information, identifying opportunities and constraints (including e.g. a social assessment, a biophysical assessment, a valuation assessment of the values of ecosystem services and natural capital of the catchment, identifying the opportunities and constraints (stakeholders, municipalities, beneficiaries);
3. Planning Phase: a participatory process which identifies the vision, strategies, objectives, and planning tools for implementation, whose results are summarized in a restoration implementation plan indicating which potential measures should be taken at particular locations, submitting the plan for approval by legal instances – including the positive acceptance of the Environmental Impact Assessment – and develop different strategies for mainstreaming and supporting (financially) restoration and sustainable catchment management (like PWS, nature-based tourism, incentives);
4. Management Phase:
  1. restoring the biophysical functioning of the catchment by implementing ('no regret') measures;
  2. building awareness and capacity of local stakeholders and tourists
  3. attracting additional funding, manpower and raising awareness for implementation and achieving the above mentioned goals by organising innovative form of financing
  4. implementing, supporting and/or institutionalising different strategies of PES
  5. creating an enabling environment by designing a 'learning village', which will assist with adaptive management through capacity building, education, awareness raising and knowledge exchange.



Several scoping studies on PES have been executed in the Baviaanskloof before 2009:

1. Who's willing to restore & why? Stakeholder & network analysis of ecosystem service utilisation (E. Noirtin)
2. Exploring institutional capacity for carbon sequestration schemes for financing ecosystem services (E. Lorencova)
3. Livelihood analysis and economic valuation of services provided by the subtropical thicket ecosystem (I. de la Flor)
4. Socio-cultural values of ecosystem services: relevance to restoration planning & implementation (K. Janssen)
5. Soil characteristics & optimum growth factors for *Portulacaria afra* (spekboom) (J. Spekrijse)
6. Valuing downstream benefits of restoring water regulation services: Baviaanskloof-Gamtoos catchments (L. van der Burg)
7. Investigating institutional arrangements required to implement PES in the Baviaanskloof and Gamtoos catchments (H. Ali Javed)

A prime focus in 2009 was to undertake research which further identified opportunities and threats – specifically at the social and ecological interface for setting up a working ecosystem management incentives scheme (e.g. Payments for Ecosystem Services). This was done by linking the previous research with the implementation aims of the PRESENCE partners. In this respect, a key planned activity was to investigate the feasibility (from multi-disciplinary dimensions) of the set-up and roll-out of the aforementioned PES scheme (at catchment level).

Planned activities also centred around further engaging and empowering stakeholders in restoration and raising awareness, education and communication around ecosystem/landscape services, restoration, ecosystem management and the wise use of natural resources (especially water). A key milestone was to strengthen the transdisciplinarity of PRESENCE by further integrating research and implementation.

In 2009, the following scoping studies have been carried out:

1. Hassing, A. 2009. Towards a PRESENCE Learning Network in restoring ecosystem services & natural capital. MSc thesis, Forest & Nature Conservation Policy Group, Wageningen University)
2. De Paoli, G. 2009. Perceived landowner risks and benefits of PES for restoration: an assessment of investment & compensation scenarios. Environmental Economics & Natural Resources Group, WUR-Alterra/LEI & LNV-DLG.
3. Fousert, W. 2009. Assessment of tourists' landscape experiences and preferences in the Baviaanskloof. Socio-spatial Analysis Group, Wageningen University.
4. Chuchmakova, L. 2009. Assessment of pupils' perception of ecosystem & landscape services as a basis for designing environmental education strategies. Environmental Systems Analysis Group, Wageningen University.
5. Selomane, O. 2009. Water productivity in the Kouga catchment. Environmental Economics & Natural Resources Group through Wageningen University and-LEI.
6. Montpetit, A. 2009. Assessment of tourism operators' attitudes toward nature and restoration of natural capital in the Gamtoos Valley. MSC thesis, Freiburg University.

With the collaboration of PRESENCE partners a first scoping study was carried out on the opportunities and challenges around PES. This is published in the following report:

'De Paoli, G. 2009. River system restoration for a sustainable land and water management in the Baviaanskloof Mega-Reserve. Preliminary assessment of the opportunities and challenges to the creation of a Payment for Watershed Services Scheme", WUR-Alterra/LEI & LNV-DLG.'

At the moment, a study is being carried out looking at the marketing and communication strategies for PES. This study will be finished at the end of April. Alterra, Rhodes University and Stellenbosch University have been consulted and in collaboration with them new research items have been identified.

Summaries of the reports are included in the Annex v. This summary document is designed to feed the Trans-disciplinary Assessment and Implementation Framework (TAIF) adopted by PRESENCE in the Baviaanskloof (see document), as a research Approach, as well as provide feedback on the progress made in the Baviaanskloof in terms of research done by students.

#### 4.2 South African Scholarships

The Water for Food and Ecosystem project is an integral part of the PRESENCE learning network active in the Baviaanskloof. One of the main objectives of this network is to develop South-North collaboration, knowledge exchange and capacity building around restoration of living landscapes. This project does not only contribute to this with supporting the involvement of WUR/Alterra specialists and WUR students, but also with building local capacity by providing scholarships for 2 South African PhDs and one South African MSc student. In addition, through the project, support was provided for 4



Rhodes students on a fieldtrip with Professor Ellery, Rhodes University

honours students' research projects, 1 PhD and 2 honours field trips. The South African students are linked to the visiting WUR students to promote knowledge and cultural exchange.

The scholarship funding of the project has been allocated (by contract) to Rhodes University and Stellenbosch University to full PhD positions. Funding is also provided for an MSc scholarship to EC Parks to build capacity within the Baviaanskloof Mega-Reserve staff.

The topics that the successful students will work on are:

1. To investigate and demonstrate that change of land-use from high impact stock farming to "carbon/water-farming" in marginal agricultural is financially sustainable. (ECP Master student)
2. To investigate trade-offs between different ecosystem services (ecological and socio-economic) in restoration ecology using the Baviaanskloof as a case study. (Rhodes University)
3. Establishing institutional arrangements for a 'Payments for Ecosystem Services' scheme in the Baviaanskloof World Heritage Area. (Stellenbosch University)

#### 4.3 The local supervision of WUR Students

During the past year, Living Lands has been very active in hosting and facilitating international students at the PRESENCE Learning Village. Almost twenty students enjoyed a beautiful and rewarding stay as well as a life changing learning experience in the Baviaanskloof. All the studies and internships have greatly assisted in the process of building trust, knowledge and goodwill to support restoration in the Baviaanskloof. There were eight students from Wageningen University with some combining both internship and thesis. In total, the result of the visiting Wageningen students is five internships reports and seven thesis reports. An overview of all the Wageningen students and their subjects can be found in the Annex vi. All the PRESENCE research can be found on the PRESENCE Online Portal, <http://www.livinglandscapes.co.za>.

#### 4.4 Supervision of WUR students (Alterra and LEI)

The supervision of students from WUR was executed jointly with Alterra, LEI and various Wageningen University research groups. The following WUR entities have been involved in the supervision work

1. Alterra-Centre for Water & Climate (WUR-DLO)
2. LEI (WUR-DLO)
3. Wageningen University Environmental Systems Analysis group
4. Wageningen University Land Degradation and Development group

The input from WUR consisted of:

- Elaboration of Terms of References for students' theses and internships;
- Recruitment and selection of students;
- Co-supervision of students; Discussions of TORs and outputs, liaisons with partners;
- Presentations on workshop;
- Assisting in setting-up the research agenda.



The student thesis work that already started in 2008 was further supervised in 2009. This refers to the “Preliminary assessment of the opportunities and challenges to the creation of a Payment for Watershed Services scheme” and “River System Restoration for Sustainable Land and Water Management in the Baviaanskloof Mega-Reserve”.

New thesis work and internships were also initiated and partially completed. Firstly the following Terms of References were drafted:

- Regional investigation (rapid assessment) of risks of erosion and land degradation in the Baviaanskloof and the identification of critical areas (MSc thesis work);
- Water productivity in the Kouga catchment (MSc internship);
- Monitoring (MSc thesis work);
- Hydrological impacts of restoration (BSc internship).

In the framework of the first topic a draft digital erosion risk map was composed in 2009, which will be further detailed in 2010. The internship report: “Water productivity in the Kouga catchment” was completed in 2009. A start has been made with the monitoring programme. The study on the hydrological impacts of restoration was prepared in 2009, and a student will start in February 2010.

The input from Wageningen University (WUR) was briefly presented in the workshop “Dialogue around proposed measures and incentives for landscape/catchment restoration in and around the Baviaanskloof Mega-Reserve” on 5<sup>th</sup> and 6<sup>th</sup> November 2009. This workshop was attended by Herco Jansen of Alterra, Petra Hellegers of LEI and Michel Riksen of the WUR Land Degradation and Development Group. The WUR participants also contributed to the research agenda for the coming years, the prioritization of subjects and the desired inputs/outputs from a WUR perspective.

## 5. Capacity building and awareness

### 5.1 Learning Village

The PRESENCE Learning Village has been further developed as the research hub for restoration in the Baviaanskloof. There have been several field trips organised, such as a group of Rhodes University Honours students in February, and several field trips with the different PRESENCE partners. In 2009, a new office was equipped and several small improvements have been made. The plans for developing an ethno-botanical garden which showcase and facilitate education for restoration in and around the Learning Village are in progress.



Impression of the 'Learning Lapa' by S. Overmeire & R. Pullen

In the centre of the PRESENCE Learning Village, a Learning Lapa is being constructed and is to be completed by mid-2010. The Learning Lapa will be used for workshops, education and awareness raising for students, workers from Working for Water/Woodlands, local children and of course the PRESENCE partners.

### 5.2 Stakeholders engagement

Stakeholder engagement and empowerment is an intensive and ongoing process in order to create an environment conducive with learning, mutual understanding, trust and compassion between all the partners. The process of ‘mainstreaming’ restoration in the Baviaanskloof is going very well. The project Water for Food and Ecosystems works as a catalyst in the area. The project partners of the PRESENCE network see the opportunities and are also keen to invest in the area. This is a very positive side effect of the project.

The involvement from the Dutch Government in *PRESENCE in the Baviaanskloof* has allowed Living Lands to further extend and deepen collaboration within the PRESENCE network. Stakeholder engagement is one of the key factors for the success of the programme, particularly during the planned stages in 2009-2010. Refer to the Annex vii for an overview of the stakeholder engagement activities.

### 5.3 Consultancy (DLG)

Plans were drawn up to carry out a strategic workshop on PES for EC Parks managers. A proposal has been prepared for the workshop and communicated with EC Parks. There was however a need for more preparation and a broader needs assessment, which has been carried out instead of the workshop itself. It is expected that the workshop will be held later in 2010.

## 6. Project coordination and project management

### 6.1 Coordination of programme

The coordination of the programme has been an intensive process with all stakeholders of the PRESENCE Learning Network. It started with an integrated strategy document for catchment restoration of the Baviaanskloof “*PRESENCE in the Baviaanskloof*”. This document was discussed with the main stakeholders and landowners with positive feedback. The coordination of the programme has been focusing on engaging different partners and developing mutual partnerships. Living Lands is maintaining a complete overview and facilitating synergies between different project partners and phases from the implementation to research and monitoring to capacity building. The Annex vii provides an overview of the main coordination of programme activities.



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## Annex:

- i) Overview of PRESENCE partners
- ii) Restoration plan of the alluvial fans;
- iii) Restoration plan of the denuded valley slopes;
- iv) Monitoring plan;
- v) Summary of research reports;
- vi) Overview of Wageningen students;
- vii) Overview of project coordination and stakeholder engagement