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Integrated Water Harvesting Project Mpumalanga, South Africa

APPRAISAL REPORT



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Currency exchange rate

100.00 European Euro = 1,307.23 Rand South Africa

1 European Euro (EUR) = 13.0723 Rand South Africa (ZAR)

1 Rand South Africa (ZAR) = .0765 European Euro (EUR)

As of February 2009.

Acronyms and Abbreviations

AfDB	African Development Bank
ARDRI	Agricultural and Rural Development Research Institute (University of Fort Hare)
AWF	African Water Facility
AWIRU	African Water Issues Research Unit (University of Pretoria)
CMA	Catchment Management Agency
DWAF	Department of Water Affairs and Forestry
FIRR	Financial Internal Rate of Return
ICMA	Inkomati Catchment Management Agency
IWHP	Integrated Water Harvesting Project
IWRM	Integrated Water Resources Management
MoU	Memorandum of Understanding
NCB	National Competitive Bidding
NGO	Non-Governmental Organisation
NWA	National Water Act
PFS	Project Financial Statement
RWH	Rainwater harvesting
SHO	Local Shopping
TOR	Terms of Reference
UWC	University of the Western Cape
PSC	Project Steering Committee
PCMT	Project Coordination and Management Team

Logical Framework Analysis

HIERARCHY of OBJECTIVES	EXPECTED RESULTS	REACH BENEFICIARIES	PERFORMANCE INDICATORS	INDICATIVE TARGETS and TIMEFRAME	RISKS & MITIGATON MEASURES
<p>GOAL:</p> <p>Contribute to the improvement of sustainable livelihoods in poor communities living in subtropical regions with protracted periods of low rainfall, to break through the food insecurity barrier through the use of rainwater harvesting and efficient soil moisture management</p>	<p>IMPACT:</p> <ul style="list-style-type: none"> Improved (i) capability of food production and income generation, (ii) social capital, (iii) management skills, (iv) health through better nutrition and (v) knowledge in the form of awareness of linkages between soil and water quality and water management, and food production, nutrition Replication of implemented RWH systems, using often overlooked local water resources 	<ul style="list-style-type: none"> Villagers in the region facing similar water challenges to secure food. Decision-makers in the Department of Water Affairs and Forestry and the Department of Agriculture. Communities outside project area 	<p>Indicators:</p> <ol style="list-style-type: none"> Improvements in quality of life related to water obtained from RWH. Number of sites where RWH technologies have been replicated. <p>Source: Project baseline and subsequent socio-economic surveys. Periodicity: Bi-annual review</p>	<ol style="list-style-type: none"> Elimination of hunger for direct project beneficiaries. Ten replications of RWH systems <p>Time Frame: 5 years</p>	
<p>PURPOSE/OBJECTIVES:</p> <p>Assist communities in Ehlanzeni to improve food security and income generation</p> <p>Demonstrate and stimulate interest in rainwater harvesting technologies and related approaches to secure water for food and income.</p>	<p>OUTCOMES:</p> <ul style="list-style-type: none"> Increased output in production of primary food crops in both summer and winter Empowerment of local women and youth through livelihood diversification, income generation and increased resilience to climate change Lasting stakeholder support for RWH Experience widely disseminated 	<ul style="list-style-type: none"> Beneficiary communities Regional and local authorities involved in IWRM exposed to RWH and poverty related benefits. 	<p>Indicators:</p> <ol style="list-style-type: none"> Land area under production and estimated produce yields. Cash returns from crop sale. Enhanced collective action and self-esteem in target communities No. of external stakeholders manifesting goodwill towards the project Publications, presentations etc. <p>Source: Baseline survey, monitoring reports and meeting minutes. Periodicity: Monthly data collection, annual reporting.</p>	<ol style="list-style-type: none"> Whole field at 70% intensity during wet season and sufficient water in dry season for 40% of field area at 70% intensity. Average cash return from crop sale equals R20,000/ha/year 50% of women and youth feel empowered through process. At least five involved by EOP Dissemination at local, district, national and regional levels by EOP <p>Time Frame: 2 years</p>	<p>Risk: During extremely dry years water yields of the RWH systems may not achieve full irrigation levels and perceptions of failure might prevail.</p>
<p>ACTIVITIES</p> <p>Enhance efficient utilization of harvested water by</p>	<p>OUTPUTS</p> <p>1: Communities equipped with skills in efficient use of rainwater harvesting and</p>	<ul style="list-style-type: none"> Community group members 	<p>Indicators:</p> <ol style="list-style-type: none"> % of households using one or other 	<ol style="list-style-type: none"> 50% by end of the first year and 70% by second 	<p>Mitigation: System yields are modest</p>

<p>community groups</p> <ul style="list-style-type: none"> • Create awareness of relationship between water, soil, food production, nutrition and health. • Agriplanner training • Test soils • Facilitate land tenure agreements for RWH systems • Facilitate market access <p>Develop learning resources materials</p> <ul style="list-style-type: none"> • Analyse needs • Design, develop and translate materials <p>Establish RWH infrastructures</p> <ul style="list-style-type: none"> • Finalize designs, tender and supervise construction • Construct RWH systems • Community O&M training <p>Networking and collaboration</p> <ul style="list-style-type: none"> • Establish liaisons with local authorities • Identify and network with other stakeholders • Bi-monthly stakeholder meetings <p>Manage Project</p> <ul style="list-style-type: none"> • PM activities • Establish Ref Group <p>Monitoring & Evaluation</p> <ul style="list-style-type: none"> • Baseline survey • Periodic monitoring • Progress reports 	<p>soil moisture management for horticultural purposes and with greater understanding of the linkages between water, soil conservation, food production, nutrition, health and IWRM</p> <p>2: Posters, manuals, puppet theatre available for use in and outside the project</p> <p>3: Water harvesting and storage infrastructure in place and operational, providing water for food gardening during the dry season</p> <p>4: Strengthened relations of knowledge sharing and collaboration between communities, partner organisations, other NGOs, community groups and local authorities, as well as other institutions</p> <p>5: Project completed in time and within budget</p> <p>6: M & E and lessons learnt documented and available for future projects in SA and beyond</p>	<p>and dependents</p> <ul style="list-style-type: none"> • Population in target communities • Other communities and stakeholders, incl.: ICWA, WMAs, DWAF, NGO's and donor institutions, postgraduate students and researchers in SA and beyond 	<p>of skills acquired</p> <p>2. Number and quality of posters and training manuals produced and number of performances of street theatre</p> <p>3. Number of completed RWH systems based on secure land tenure agreements, operational in dry and wet seasons.</p> <p>4. Involvement of regional IWRM authorities in project implementation and monitoring.</p> <p>5. Timely submission of Project Completion Report and approval hereof by AWF</p> <p>6. Baseline survey report, progress reports</p> <p>Source: Ref. Group Minutes, Progress reports and follow-up socio-economic and technical surveys.</p> <p>Periodicity: Monthly record keeping and consolidation annually.</p>	<p>2. Five posters; Two manuals produced; 4 street theatre performances</p> <p>3. Four pilot RWH projects constructed and operational, based on written land-tenure agreements</p> <p>4. At least two regional IWRM authorities involved by EOP</p> <p>5. Draft PCR submitted by EOP</p> <p>6. One baseline survey report within six months from project start. Six progress reports, two products documenting lessons learnt</p>	<p>but will have impact. Expectations must be clarified in the detailed design consultation process. The systems can be cost-effectively expanded in phases to increase water in future.</p>
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0. EXECUTIVE SUMMARY

0.1 Origin of the project

0.1.1 Ehlanzeni is one of the poorest districts in the Mpumalanga Province of South Africa. The estimated unemployment rate is 76%, and 89% of the population earn less than USD 100 per month, which, with an average household size of four to five people, equates approximately US 75 cents per person per day. Many households rely on meagre Government grants or the limited, unreliable cash flows from the sale of surplus food garden produce.

0.1.2 Groups of women and youth in four target communities have organised around the immediate and pressing issues of food production, community HIV/Aids support and income generation; the latter through a mix of food gardening, poultry enterprise and crafting. Land has been allocated by local authorities. The groups face various challenges, yet the issue of securing water availability in order to increase food production and cash returns from food is one of their top priorities.

0.1.3 The rainfall pattern only allows for one rain fed cropping season per year. However, as annual precipitation in Mpumalanga province is above the average for South Africa, rainwater harvesting presents a viable option as a low risk and replicable way of securing water.

0.1.4 The Integrated Water Harvesting Project was formulated by a local NGO, Ecolink, in response to a direct request for help from local community groups in the target communities, to address the need for local water resources development and management for small-scale productive enterprises.

0.2 The project

0.2.1 The project's objective is to assist these communities in the Ehlanzeni District of Mpumalanga Province of South Africa to improve output from their communal food gardens through collection and management of surface run-off from precipitation and better management of soil moisture. The components include (i) Community capacity building to strengthen food security and income generation (ii) Development of learning resources (iii) Construction of Rainwater Harvesting Infrastructure and related technologies (iv) Outreach and institutional capacity strengthening (v) Project management, Monitoring & Evaluation.

0.2.2 The project will address the vulnerability of beneficiary communities to the high variability of atmospheric and soil moisture, critical to their horticulture based livelihoods, through establishing the means and capacity for collecting and storing water for vegetable gardening during the wet season for use in the five dry months of the year. More importantly, based on its design, the project will foster social capital and empower the women's and youths' groups who are the primary target beneficiaries, as well as the larger community, to better address issues affecting local livelihoods, in particular in relation to water scarcity, climate change and food production.

0.2.3 Within the areas of intervention of the African Water Facility (AWF), the Integrated Water Harvesting Project (IWHP) addresses the concern for meeting water needs. The project is particularly relevant for AWF support as it does this in a way that has hitherto received little attention. In addition, the project addresses the need for strengthening community involvement in Integrated Water Resources Management (IWRM) and bringing local perspectives into the IWRM debate. This process, in turn, can be expected to contribute to the enhancement of local governance processes by inspiring and empowering local women, men and youth to take part in (and responsibility for) improved water resource management at the local level.

0.3 Recommendations

0.3.1 It is thus recommended that the AWF grant the applicant, Ecolink, an amount of EUR 374,010 to finance the Integrated Water Harvesting Project as described in the present report.

1. BACKGROUND

1.1 *Origin of the Project*

1.1.1 Ehlanzeni is one of the poorest districts in the Mpumalanga Province, South Africa. According to income data from the 2001 census, 67% of the population have no income at all, and a total of 89% earned less than the official poverty breadline of R800 per month, approximately USD 100. The majority of households earn less than this, which, with an average household size of four to five people, equates approximately US 75 cents per person per day. The 2007 Poverty Node Survey¹ estimated unemployment rate at 76%. Other than relying on government grants, for many households, it is the meagre, unreliable cash flows from small-scale agriculture that provide any form of livelihood at all.

1.1.2 The average rainfall for the project area is 746 mm/year, all though there is high variation between communities. In South African terms this makes the target area relatively wet with annual rainfall above the threshold for successful crop production. Nevertheless, only a single rain-fed cropping season is possible as almost all rain falls between October and April. Water availability remains a critical constraint, particularly in the mid-winter months from May to September, which are effectively dry from a crop-production point of view; making supplementary irrigation essential for any production other than established tree-crops.

1.1.3 Groups of women and youth in the four target communities of Luphisi, Mbonisweni, Dwaleni and Mjejane in Ehlanzeni District, Mpumalanga Province (See map, Annex 1) have organised around the immediate and pressing issues of food production, community HIV/Aids support and income generation; the latter through a mix of food gardening, poultry enterprise and crafting, on land allocated by local authorities. Of the various challenges these groups are facing, the issue of securing water availability in order to increase food production and cash returns from food gardening was identified by group members as among their top priorities.

1.1.4 The Integrated Water Harvesting Project (IWHP) was formulated by Ecolink, a local Non-Governmental Organization (NGO), in response to a direct request for help from local community groups in the target communities, to address the need for local water resources development and management for food production and poverty reduction.

1.1.5 The Appraisal Report is supported by a Technical Report, which provides background data and analytical depth on the technical component, the socioeconomic profile of the region and the relevant water policy frameworks and legalities.

1.2 *Sectoral Priorities*

1.2.1 Water Management and Allocation

1.2.1.1 South African legislation acknowledges water as an asset and strategic resource, and

¹ The Poverty Node Survey was carried out in November 2007 under the auspices of AWIRU contracted through the Southern Africa Labour and Development Unit at the University of Cape Town and funded by Mellon Foundation. A household survey was implemented in the Ehlanzeni District Municipality to supplement the Censuses from 2001 and 1996. The sample size was 484.

the National Water Act (NWA) of 1998 requires sustainable and equitable management and use of national water resources for the benefit of all persons. The NWA has introduced radical change in South Africa's management of water. A hierarchy of water entitlements that allow minimally regulated access for smaller users, particularly the poor, through a series of regulatory categories², has been established and mechanisms have been defined for balancing water allocations for economic versus social and environmental benefit. This includes a range of social, institutional and agricultural programmes to ensure access to water and land for people in poverty stricken areas and to promote efficient and sustainable resource use³.

1.2.1.2 Of special interest is the national Water Allocation Reform (WAR), which considers equitable access to water, or to the benefits derived from using water, as being critical to eradicating poverty and promoting economic growth. The Water Allocation Reform (WAR) is DWAF's key programme for redressing these inequities and specifically aims to:

- Take steps to meet the water needs of the poor and disadvantaged;
- Ensure participation by these groups in water resource management;
- Promote the sustainable use of water resources; and
- Promote the beneficial and efficient use of water in the public interest.

1.2.1.3 Integrated Water Resource Management (IWRM), embodied in the NWA and operationalised on the basis of the National Water Resources Strategy, is being implemented in the formation of Catchment Management Agencies (CMA) in nine Water Management Areas⁴. The CMAs are currently being piloted in two catchments: The Inkomati catchment in Mpumalanga and the Mhlathuze catchment in KwaZuluNatal. It is expected that the strengthening of the role and regional presence of the CMA's, will enhance overall management of water issues and ameliorate the past disjuncture between Water Resources Management as the responsibility of National Government and Water Supply (i.e. for domestic use) as the legal responsibility of local authorities, typically the District Municipality.

1.2.2 Challenge of Domestic Water for Agricultural Use

1.2.2.1 In South Africa water service authorities are legally required to supply 6000 litres per household per month within 200m from every household, at no cost to the user. This is called 'free basic water' and is considered a basic human right. Water consumption above the 'free basic water' limit is provided charged at cost. However, in general affordability levels are such that functional water meters, allowing rural household billing, are rarely found. The systems are regulated by two factors: first where supply is through communal taps, the task of carrying water up to 200m acts as a practical regulator of household consumption. Secondly, where tap stands are provided inside people's plots, making consumption more difficult to control, a widespread management practice is to limit water supply to one day a

² The categories include the 'reserve' for basic domestic consumption and environmental preservation, which is the only right as such in the Act, and three subsequent degrees of increasing regulatory control, the highest being compulsory water licensing. Further details are provided in the Technical Report.

³ These include the Land Reform Programme, the Water Allocation Reform Programme, Catchment Protection Programme, the Comprehensive Agricultural Support Programme and the Financial Assistance for Resource Poor Farmers Policy, among others. While there is some progress in these major national programmes they also face major social, legal and institutional challenges.

⁴ The previous 19 Water Management Areas in South Africa, each with its own CMA, were reduced to 9 in November 2008.

week or even 1 day a month. This second practice is not a legal measure and is typically attributed to maintenance problems. Due to the prevalence of unmetered systems in rural communities and their relatively high operational and maintenance costs, Water Service Authorities, who are acutely conscious of costs, firmly prohibit 'unlawful use' such as garden watering, as they do not have the means to measure use and bill for additional consumption – even though water and municipal law makes provision for this.

1.3 Problem Definition

1.3.1 The population of the Ehlanzeni district with access to latrines is estimated at 92% with 7% having access to flush toilets. The poverty Node survey previously mentioned shows that 8% of the population had piped water in the house, 48% had piped water on the stand, 36% fetched water from communal taps and 4% obtain water from a tank or carry it to the dwellings. A fundamental problem of drinking water in the area is that it is supplied on an intermittent basis reaching sometimes once in two weeks. This implies that consumers have to provide storage of up to half of a month's consumption. Villagers rely on a combination of sources including:

- Roof runoff stored in drums or tanks
- Water in communal tapstands when present (once or twice per month or ad-hoc depending on location and municipality operational status and management approach to limiting supply for cost and resource availability reasons)
- Springs and seeps – mainly adjacent to rivers
- Pools in rivers and streams when available – mainly for washing
- Borehole or tank water 'borrowed' from the Clinics
- Water purchased from hand-carts and vendors

1.3.2 The population has identified that water is a main limiting factor for small-scale agriculture and other productive enterprises. The rainfall pattern only allows for one rain fed cropping season per year. However, as annual precipitation in Mpumalanga province is above the average for South Africa, rainwater harvesting presents a viable option as a low - risk and replicable way of securing water for food production. Additional information on water availability in the project area is provided in Annex 2 of this report.

1.3.3 The proposed project will address the problem of water security through the introduction and local application of Rain Water Harvesting (RWH) and IWRM principles for the appropriate management of water resources for small-scale food production enterprises by community groups. There are no nearby perennial streams in the vicinity of the planted gardens; while groundwater sources such as springs and old boreholes have been exploited to their full limit. This leaves RWH as the only effective option that could still be combined with and be complemented by these other sources where they are feasible. The intervention will strengthen the local capacity to analyze and address issues of water scarcity in relation to food production and income-generating activities in the communities of Lumphisi, Mbonisweni, Dwaleni and Mjejane in Ehlanzeni District, Mpumalanga Province. At the same time it will demonstrate specific, locally adapted solutions that build on a combination of appropriate technology and collective action.

1.4 Beneficiaries and Stakeholders

1.4.1 The project comprises training and capacity building involving individuals, groups and institutions; implementation of locally adapted technical infrastructure interventions for

enhancing water security for small-scale productive activities, as well as a significant element of strategic learning and knowledge generation. The beneficiaries and stakeholders of the IWHP thus comprise a very diverse group.

1.4.2 The direct beneficiaries of the IWHP include: 100 members of the six community based small-scale productive enterprises and their 483 direct dependants; the population of the four target communities, which amounts to a total of 11,000; as well as local authorities and institutions, including the Inkomati Catchment Management Agency and the regional office of the Department of Water Affairs and Forestry (DWAF). Additional beneficiaries and stakeholders include research and education institutions, post-graduate students, governmental agencies and NGOs, as well as donor organizations. An overview of beneficiaries and stakeholders is provided in Annex 4.

1.4.3 The community groups involved are largely made up of women or youth, many of whom represent female- or youth headed households (further details provided in Annex 4). All six groups are established as legal entities – either as trusts or co-ops. The groups have operated for between 6 and 14 years and have a history of cohesion and collective action. Their role in the project is not only as primary beneficiaries, but also as key actors and agents of change in the practical application of the concepts and technological solutions introduced. The ultimate success of the project will depend on their ability to take up and manage these interventions to be an inspiration for other women, men and youth.

2. THE PROJECT

2.1 Impacts

2.1.1 The goal of the project is to contribute to the improvement of sustainable livelihoods in poor communities living in subtropical regions with protracted periods of low rainfall to break through the food insecurity barrier through the use of rainwater harvesting and efficient soil moisture management. Most specifically this will be achieved in the project area through the implementation of site specific rainwater harvesting infrastructure and by engaging the communities in improved management of rain fed farming and soil moisture management, while empowering them through processes that promote self esteem, and facilitate access to land use rights.

2.1.2 The project impacts are expected to be in the area of improvement in (i) capability of food production and income generation, (ii) social capital, (iii) management skills, (iv) health through better nutrition and (v) knowledge in the form of awareness of linkages between soil and water quality and water management, and food production, nutrition. It is furthermore expected that RWH systems demonstrating practical use of local water resources that are often overlooked will be replicated. This replication of RWH systems could be at an intensive homestead scale for individual growers, or at the scale of extensive farming.

2.2 Outcomes

2.2.1 The objectives of the project include: 1) to assist communities in the Ehlanzeni District of Mpumalanga Province of South Africa improve output and income generation from their communal food gardens through collection of surface run-off from precipitation and through better management of soil moisture; and 2) to demonstrate and stimulate interest

in rainwater harvesting technologies and related approaches to secure water for food and income. The primary outcomes are:

Increased output from rain-fed gardening

The communities in the project area will have skills to enable them to increase output from smallholder gardens as a result of improved decision making and management of soil fertility and available soil moisture. Included in the skills are institutional capacity for the participating groups in the areas of administration, financial management, organisational transparency and leadership through mentoring.

Community empowerment and improved resilience from rainwater harvesting

Four women's food garden groups and 2 youth groups will have been empowered to produce higher yields and to increase planting during the dry season by using run-off harvested from local micro catchments and stored in small reservoirs provided under the project. While the wider mix of crops will contribute to improving nutrition of community members, the sale of surplus production will enhance income generation for group members. In addition land tenure agreements will be facilitated. Thus, the intervention will help local communities improve their ability to respond to harsh and unpredictable weather conditions and climate change.

Local stakeholder support for rainwater harvesting

Communication and relationship between communities and local government will be strengthened and local stakeholders' (e.g. Local and District Municipalities) capacity and opportunities to support community efforts in improving rain fed agriculture and rainwater harvesting will be enhanced. As a result there will be greater community commitment to manage water resources in the area using the Integrated Water Resources Management (IWRM) paradigm.

Lessons learnt widely disseminated

Beneficiaries will share lessons learnt among members of their communities and with the global RWH community through word of mouth and documented results. It is furthermore expected that current local convictions, that summers are too hot for vegetables growing, will change. The project will become a focal point for a holistic approach to research concerning social issues, water management and agriculture.

2.3 Outputs and Activities

2.3.1 Output 1: Capacity to improve food security and income generation

The communities will be equipped with skills in efficient use of rainwater harvesting and soil moisture management for horticultural purposes and with greater understanding of the linkages between water, soil conservation, food production, nutrition, health and IWRM. Land tenure will be secured under the communal tenure system, which prevails in all target communities, and is under the direct jurisdiction of the Tribal Authority. Prior to investment each group must obtain a written confirmation of their permission to use and occupy the land for purposes of food production.

2.3.2 Activities will consist of

- Creating awareness regarding the relationships between water, soil, food production, nutrition and health, with particular emphasis on sustainable

farming techniques that improve soil water absorption and retention. Skills are primarily qualitative and indicators are adapted to suit even beneficiaries with limited literacy and numeracy.

- Training in small holder gardening decision using a custom made planning tool “Agriplanner”, which has been tested in South Africa and adapted to local conditions. Decision areas covered include operations, marketing, financial and human resources planning. Training is provided in the vernacular using role/game planning and other adult learning techniques.
- Assistance in testing soils for better selection of farming systems
- Facilitate written land tenure agreements according to official requirements
- Assistance with access to markets for inputs and outputs

2.3.3 **Output 2:** Develop learning resources

The project will produce posters depicting the water cycle and rain water harvesting technologies, user friendly manuals about intensive food production, nutritional value, food preparation techniques, post harvest preservation and storage of produce and aspects of income generation that result from food crops, as well as scripts for puppet theatre drama about water resources issues set in a local context. These will be made available to facilitators, learners and involved communities as well as communities who express an interest outside the project.

2.3.4 **Activities** include:

- Analysis of needs through a workshop; design of materials, development of puppet drama for street theatre
- Translation of materials into the vernacular languages

2.3.5 **Output 3:** Water harvesting infrastructure development

The planned water harvesting infrastructure entails storm water diversion from high runoff surfaces - such as roads, rock outcrops, steep rocky basins, and roofs of existing buildings - into storage within the fields for use during the almost totally dry period from April to October. In addition, a mix of infield RWH techniques will maximise infiltration of additional runoff into the root zone. The designs prioritise technical solutions that can be further expanded in subsequent phases to increase water yield, and which can easily be replicated. The use of gravity fed irrigation systems minimise maintenance constraints and operational costs.

2.3.6 The characteristics of the proposed water harvesting schemes matching locality specifics can be summarized as follows:

- At Mbonisweni, where the soil is shallow with a clay sub-soil layer, the solution incorporates surface impoundment of water in addition to reviving the old system of terracing and in-field water harvesting to irrigate an area of 4,500m². The intake structure, sedimentation point, earth dam and 300 meter piping are to be provided at a total base cost of R367,000.
- At Mjejane a granite dome is to be used as a natural ‘roof’ collector with a silt trap and a pipeline leading to a lined reservoir to irrigate an area of 4,000m². The intake structure, drinking trough, concrete lined dam and 900 meter piping are to be provided at a total base cost of R357,000.

- At Dwaleni rainwater harvesting from the roof of the existing chicken abattoir and tank storage will be complemented by an infiltration trench collecting surface runoff from the large paved area around the abattoir to irrigate an area of 235m². The ten plastic tanks with 150 meter piping will be provided at R83,000.
- At Luphisi an existing granite basin is to be exploited using a gabion weir and a lined canal leading to a lined reservoir in the field to irrigate an area of 9,500m². The intake structure, canal and storm culvert works, concrete lined dam and 300 meter piping are to be provided at a total base cost of R374,000.

Except in Dwaleni where the storage capacity of 50m³ has been allowed for in the project, the proposed storage has been limited to a practical size of 1000m³ and the irrigated area computed in function of this storage. Computations are based on the rainfall and runoff database built into SAPWAT a nationally approved computer programme intended for this purpose. Crop water requirements were estimated based on an indicative cropping mix.

2.3.7 **Activities** consist of

- Finalization of the designs of RWH systems, tendering and supervision. The Consultant shall include assessment of the Environmental Impacts of the project and incorporate mitigation and management measures in the scope of works during construction.
- Construction of water harvesting infrastructure systems
- Training of communities on operation and management of the water harvesting systems. Pro-forma estimates will be prepared to form a basis for budgeting for O&M in the early years of the project operation.

2.3.8 **Output 4:** Strengthened relations of knowledge sharing and collaboration between stakeholders for enhanced sustainability

2.3.9 Emphasizing community participation, the project will stimulate the sharing of learning experiences, networking and dialogue between all stakeholders. This will include the establishment of ties of collaboration and lasting support between communities, partner organisations, other NGOs, community groups and local authorities.

2.3.10 **Activities** leading to this support will include

- Liaison with Tribal Authorities and local councillors
- Identify and network with local and regional stakeholders, including DWAF, the Inkomati Catchment Management Agency (ICMA) and non-governmental organizations NGOs, technical experts and tertiary educational institutions
- A bimonthly meeting will be held with local stakeholders including the Village Water Committee, the recipient Ecolink and local government Councillors.

2.3.11 **Output 5:** Project completed in time and within budget

Project management systems will be in place to ensure timely execution of the project including communication with, and among partners and stakeholders.

2.3.12 **Activities** will consist of:

- Establish reference group to meet twice per year.

- Planning and execution of work including procurement and administration of contracts
- Monitoring of progress of project implementation and timely addressing of issues and risks
- Convening meetings of stakeholders and partners
- Strengthening of research and implementation capacity at the local level.
- Preparation of Financial Reports and ensuring timely auditing
- Preparation of narrative reports of progress in implementation will be systematically produced at intervals agreed with the AWF
- Preparation of the final closure report

2.3.13 **Output 6:** Monitoring, evaluation and lessons learnt

Lessons drawn from regular monitoring will be used in re-planning future aspects of the project while those from the mid-term and final evaluation will be made available for wide dissemination in South Africa and beyond. Resulting data sets will in addition be available for academic and applied research (see Annex 4 for more details on institutional beneficiaries and stakeholders, incl. researchers and students).

2.3.14 **Activities** will include

- Development of indicators of implementation and performance, and implementation of baseline survey of key performance areas
- Periodic monitoring:
 - a) Measurements of technological aspects of the project
 - b) Monitoring of changes in awareness, impact on food production as well as intangible assets such as trust between stakeholders, agency and empowerment. Qualitative data will be collected using semi structured interviews, focus groups and participant observation. A control group (i.e. a village where there have been no interventions) will be considered. For the baseline methodology and follow up survey a sample will be drawn from those closely involved in the project and those who are less actively involved (i.e. community members who have not been actively involved in project implementation).
- Reporting and documenting lessons learnt

2.4 **Risks**

2.4.1 The project has addressed killer assumptions by incorporating safeguards into its design. Land tenure is effectively communal, administered by the Tribal Authorities on behalf of the Minister of Land Affairs. Secure tenure on communal land is provided through a Tribal Authority mechanism known as “Permission to Occupy”. To avoid that issues concerning land tenure become a problem, the facilitation of land tenure agreements according to official guidelines have been incorporated into the project and will be undertaken prior to investment.

2.4.2 The risk that communities may not be able to understand written communication material has been addressed by using the media such as street theatre. In addition complementary activities relating to training in aspects beyond water harvesting necessary for successful production of vegetables have also been incorporated into the design.

2.4.3 Residual risk however remains in that the communities may not fully appreciate the level of reliability associated with the RWH systems. Project management will clarify these aspects to the beneficiaries during consultations. The risk of exclusion of marginalized organization will be eliminated by purposefully bringing on board any apparently less experienced groups.

2.5 Cost and Financing plan

2.5.1 The total estimated cost of the project is shown in the Table 1 below. The costs are shown for each component by source of financing and are based on current costs of doing similar work in the region. They include an allowance for contingencies at 10% of base costs.

Table 1A: Estimated Total costs in ZAR ‘000

Components	AWF	Recipient	Beneficiaries	TOTAL
1: Capacity to improve food security and income generation	493.1			493.1
2: Development of learning resources	300.2			300.2
3: Water harvesting infrastructure development	1 937.6		71.4	2 009.0
4: Outreach and Institutional Capacity Building	332.3			332.3
5: Project Management and Reporting	1 171.9	91.8		1 263.7
6: Evaluation and Monitoring	654.0			654.0
	<u>4 889.1</u>	<u>91.8</u>	<u>71.4</u>	<u>5 052.3</u>

Table 1B: Estimated Total costs in EUR ‘000

Components	AWF	Recipient	Beneficiaries	TOTAL
1: Capacity to improve food security and income generation	37.72			37.72
2: Development of learning resources	22.96			22.96
3: Water harvesting infrastructure development	148.22		5.46	153.68
4: Outreach and Institutional Capacity Building	25.42			25.42
5: Project Management and Reporting	89.65	7.02		96.67
6: Evaluation and Monitoring	50.03			50.03
	<u>374.01</u>	<u>7.02</u>	<u>5.46</u>	<u>386.49</u>

2.5.2 The AWF grant is to finance all of the costs of the project, with the exception of part of the project management and reporting costs, which will be met by the recipient, and part of the infrastructure construction cost, which will be met by the beneficiaries in kind through their labour contribution in site clearance prior to construction work. In reality there is a further contribution in the form of land allocated to the project.

2.5.3 Table 2 below presents the Cost by Category of Expenses.

Table 2. Cost by Category of Expenses (EUR'000)

Category of Expenses	Cost
Works	109.25
Goods	37.43
Services	173.19
Miscellaneous	66.63
Total	386.49

2.6 Relevance for AWF intervention

2.6.1 The project focuses on the local application of IWRM principles for the appropriate management of water resources for small-scale productive enterprises by community groups. This is an area of IWRM, which, so far, has been relatively marginalized.

2.6.2 The intervention will strengthen the ability of local communities to analyze and address issues of water scarcity in relation to food production and income-generating activities, while demonstrating locally adapted solutions that build on a combination of local knowledge, appropriate, low-cost technology, and collective action.

2.6.3 The project is of interest to the AWF in that it addresses a concern for meeting water needs in a way that has hitherto received little attention. In addition, the project addresses the need for strengthening community involvement in IWRM, and bringing local perspectives into the IWRM debate. This process, in turn, can be expected to contribute to the enhancement of local governance processes by inspiring and empowering local women, men and youth to take part in (and responsibility for) improved resource management.

3. IMPLEMENTATION ARRANGEMENTS

3.1 Recipient

3.1.1 Ecolink shall be the recipient of the grant and implementing agency of the project. Ecolink is a registered non-profit NGO committed to promoting sustainable environmental and social development in rural communities in Mpumalanga and Limpopo Provinces. Ecolink has been active in Mpumalanga Province for more than 21 years, during which it has worked with over 20 000 people in dozens of villages on issues related to environmental management and sustainable livelihood improvement. Ecolink has experience with interventions addressing a variety of issues incl. poverty, water scarcity, food production, gender equality, HIV/AIDS, health and education.

3.1.2 The current magnitude of Ecolink's operational capacity is approximately R 10 mio/year (€ 772,212). The NGO has adequate office space and training facilities in White River, Mpumalanga, and currently has a core staff of sixteen, including the Executive Director, as well as a Financial Officer and an Administrator. The skill mix of the team span a range of relevant expertise, from community mobilization and training, agriculture and

natural resources management incl. water resource management and household water storage infrastructure, to nutrition, gender equality and social research. In addition, Ecolink has an extensive contact reach and the project team will work closely with experts at DWAF, Mvula Trust and Integrated Water Resource Management Department in the Faculty of Life Sciences, University of the Western Cape.

3.1.3 From the perspective of implementation capacity of Ecolink, there is convincing evidence of existing staff capacity, financial management systems and institutional capital, as well as previous experience in executing similar assignments.

3.2 Project Organisation and Institutional Analysis

3.2.1 The recipient shall identify a suitable qualified project manager whose qualifications will be cleared with the AWF to be assigned to the project over its duration. The project manager shall be responsible for total implementation of the project and the day-to-day management under the Chief Executive of Ecolink. (S)He shall prepare annual (and other periodic) work plans and budget for approval by the Board, submit applications for disbursement to AWF, arrange for procurement of services of consultants and contractors and suppliers.

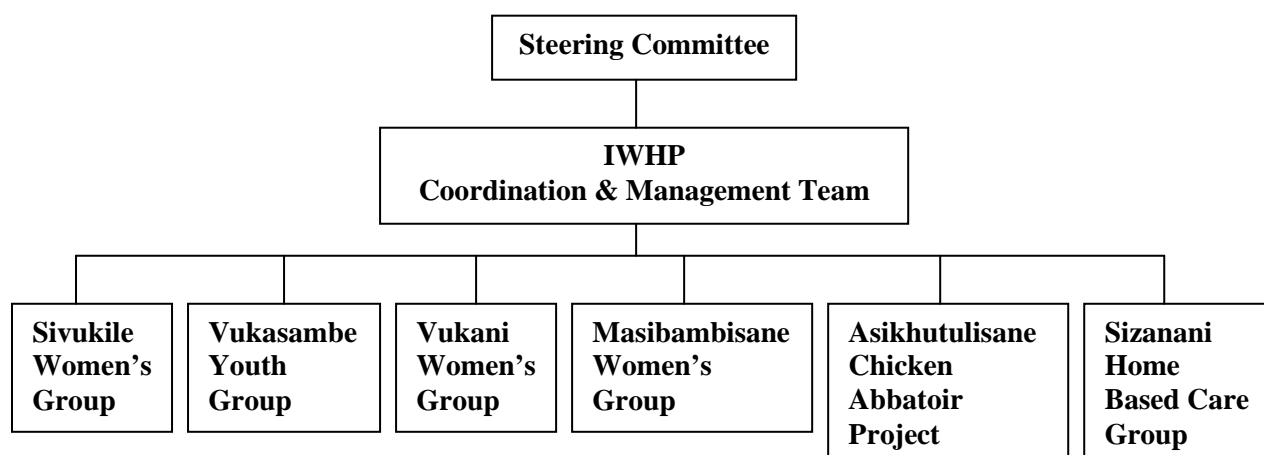
3.2.2 A firm of consultants shall be recruited to complete the designs and tender documents for the construction of infrastructure components and to supervise the construction. The firm shall in addition provide services of a technical team to train the communities with regard to the operation and management of the technical aspects of the installed works.

3.2.3 Staff of the Recipient shall undertake community mobilization, training workshops and follow up support of the beneficiaries, duly assisted by short term consultants as necessary. They shall also undertake surveys that feed into a system of Monitoring & Evaluation which uses indicators that include interviews and questionnaires, to ensure that objectives are met.

3.2.4 Each of the beneficiary communities shall sign a Memorandum of Understanding (MoU) regarding implementation of the project in their respective areas and shall undertake to be part of the participatory monitoring of the programme. The MoU shall also state the communities' responsibilities which shall include a clearly demarcated amount of site works to be executed prior to the contractor claiming site.

3.2.5 A Project Steering Committee (PSC) shall oversee and coordinate the project's implementation with its main task being to review and approve the Annual Work Plans and related Budget to ensure adherence to the development objectives. The Steering Committee is composed of representatives from DWAF, Local Government, The Beneficiary Community Groups, research/education (e.g. UWC) and Ecolink. It shall ensure that there is adequate communication and coordination among stakeholders in the project. To that extent it shall ensure that the Project Coordination and Management Team (PCMT) regularly convenes meetings of the stakeholders to discuss progress and issues as allowed for in its budget for this purpose. It shall ensure that the annual work plans have the endorsement of stakeholders.

3.2.6 The project implementation structure is as shown in the diagram below.



3.3 Implementation schedule

3.3.1 The project shall be implemented over a period of 30 months from the point of first disbursement. Annex 3 shows the timing of activities in the form of a Gantt chart. All activities concerning capacity building, learning materials, establishment and operationalisation of infrastructure, as well as networking and collaboration will take place during the main period of implementation, i.e. the first 24 months, and will be fully completed by the end of month 24. The last six months will constitute a period during which systematic monitoring of rainwater harvesting related activities in the communities will be continued, but otherwise this period will be dedicated entirely to the processing of the data and experience from the main implementation period, and the publication and dissemination of lessons learnt.

3.4 Procurement Arrangements

3.4.1 Procurement arrangements are summarized in Table 4 below. All procurement of goods, works and acquisition of consultancy services financed by AWF will be in accordance with *AWF's Operational Procedures*, the *Bank's Rules and Procedures for Procurement of Goods and Works*, or as appropriate the *Rules and Procedures for the Use of Consultants* using the relevant Bank Standard Bidding Documents.

3.4.2 Civil Works amounting to EUR 98,850 consisting of construction of water harvesting infrastructure will be implemented through shopping (SHO), while site works amounting to EUR 5,200 will be implemented by community members.

3.4.3 Goods and Miscellaneous Items: Goods consisting of Agricultural Inputs (EUR 18,040) and Motor Vehicles and Equipment (EUR 38,770) will be procured under Shopping (SHO), because these are readily available off-the-shelf equipment and standard specification agricultural inputs of small individual value. Sundry items (EUR 22,140) such as accommodation; and the requirements for report writing (EUR 19,680) will be procured through direct purchase.

3.4.4 Consultancy Services and Training: Consultancy services for Design and Supervision of Works, including training in operation and management, estimated at EUR 41,970 will be procured through competition on the basis of a shortlist using the selection procedure based on Consultants Qualifications (CQS). This is because it is a small assignment which is relatively simple and national consultants are available and capable to execute it.

3.4.5 Training on food security (EUR 18,040), development of learning resources (EUR22,960), scoping and training of WWC (EUR 10,66), baseline and follow-up surveys (EUR 18,040), project management comprising supervision and control by ECOLINK staff (EUR 29,520) and project management overheads (EUR 28,080) shall all be carried out by ECOLINK. ECOLINK is the Recipient and implementing agency for the project and is specialized in these types of activities with the competencies mentioned in section 3.1 above. The Services for soil testing and undertaking surveys (EUR 12,300) will be contracted on the basis of direct negotiation.

3.4.6 Table 4: Summary of Procurement Arrangements (Euros ‘000)

Procurement Categories	NCB	Short-list	Other	NBF*	Total
1. Civil Works					
1.1 Site works				5.46	5.46
1.2 Construction of Facilities	103.79				103.79
	103.79			5.46	109.25
2. Goods					
2.1 Agricultural Inputs			18.04		18.04
2.2 Vehicles and Equipment			19.38		19.38
			37.43		37.43
3. Consultancy Services					
3.1 Design and Supervision incl. training on infrastructure		41.97			37.05
3.2 Surveys			12.30		10.66
3.3 Training on Food Security			18.04		18.04
3.4 Development of Learning Resources			22.96		22.96
3.5 Scoping and Training of WWC			10.66		10.66
3.6 Baseline and Follow-up Surveys			18.04		18.04
3.7 Report Writing			19.68		19.68
3.8 Project Management			22.50	7.02	29.52
		41.97	124.20	7.02	173.19
4. Miscellaneous					
4.1 Management overheads			28.08		28.08
4.2 Publication and Dissemination Workshop			21.32		21.32
4.3 Sundry expenses			17.22		17.22
			66.63		66.63
Total	103.79	41.97	233.17	12.48	386.49
AWF Financed	103.79	41.97	233.17		374.01

*NBF is Non Bank Funded

3.4.7 Procurement in excess EUR 15,000 shall be subject to prior review by the AWF. All others shall unless expressly required by the AWF be subject to a post review procedure. In any case the Recipient will maintain accurate records of procurement steps including signed evaluation forms, minutes of the opening of bids and proposals and all meetings on all procurement processes. The Recipient is capable of undertaking the required procurement activities. It has the staff and the experience (Section 3.1) and will benefit from the input of consultancy services for preparation of tender documents, tendering evaluation and award of the construction works contracts.

3.4.8 The Recipient shall prepare and submit a Procurement Plan acceptable to the AWF, setting forth (a) the particular contracts for goods, works and consulting services during the life of the project; (b) the proposed modes of procurement; and (c) the related AWF review procedures (prior or post review). The Recipient shall update the Procurement Plan annually or as needed throughout the duration of the project. The mode of implementation and all revisions to the Procurement Plan are subject to prior approval by the AWF.

3.5 Disbursement Arrangements

3.5.1 The Special Account method will be used for disbursement of funds from the AWF. The project will open a Special Account with a local commercial bank acceptable to the AfDB, into which the advances will be deposited. The Special Account will be replenished on the condition that the preceding advance has been utilized and justified up to at least 50 percent and that the following advance has been fully justified. Audit of the project shall include the use of the special account and attestation that: i) the requests for replenishment of the revolving fund submitted are consistent with relevant information, ii) the internal controls and procedures used for their preparation, are reliable enough to justify the requests for replenishment, and iii) the goods and services financed from the special account have been received by the project.

3.5.2 To protect the interests of the recipient and the AWF, the bank holding the special account must issue an irrevocable undertaking that:

- Funds held in the Special Account will not, under any circumstances, be set off, seized or attached to satisfy amounts due to the bank by the project (for example by attachment) or be used as sundry collateral;
- Monthly statements of the Special Account will be issued and communicated to the project; and
- The account and related documents will be placed at the disposal of the AWF staff and its appointed auditors.

3.5.3 The expected disbursement schedule is shown in Table 5 below

Table 5: Disbursement schedule (EUR '000)	1st Tranche	2nd Tranche	Total
Output 1: Food security	19.68	18.04	37.72
Output 2: Development of learning resources	20.09	2.87	22.96
Output 3: Infrastructure	75.09	73.13	148.22
Output 4: Outreach and Institutional Capacity Building	14.76	10.66	25.42
Output 5: Project Management and Reporting	41.32	48.34	89.65
Output 6: Evaluation and Monitoring	16.57	33.46	50.03
Total	187.51	186.50	374.01

3.6 Accounting and Audit Arrangement

3.6.1 The recipient shall maintain adequate records to account for the receipt of grant funds and disbursement payments from the Special Account for services rendered, custody of supporting documents, preparation of Project Financial Statements (PFS) ready for audit reviews. AWF shall arrange for audit of PFS. Progress Reports shall include financial information.

3.7 Supervision, Monitoring and Evaluation

3.7.1 The recipient shall submit quarterly progress reports in a format to be agreed with the AWF. The AWF shall supervise the project by reviewing progress reports and responding to correspondence from the Recipient. It may, when it deems necessary, mount supervision missions to the project site.

3.7.2 The recipient shall monitor indicators shown in the log-frame performance monitoring columns, as well as those that will be determined prior to commencement of the baseline study, to determine progress of implementation in terms of outputs and outcomes.

3.7.3 The recipient shall prepare and submit a final report of implementation attesting to the completion of the project and showing lessons learnt from implementation.

4. PROJECT BENEFITS

4.1 Effectiveness and Efficiency

4.1.1 The project addresses a problem identified by the beneficiary communities, namely that of water resources for food gardening, a key element for food security and an important source of income for many households in the area.

4.1.2 The project is based on a participatory analysis involving beneficiary communities, as well as a technical expert assessment of the water harvesting infrastructure component. The proposed intervention focuses on providing lasting, appropriate and affordable solutions to address the problem of lack of water for food gardening crops at critical times in the crop cycle and throughout the year. Each solution is based on an analysis of specifics of the locality, and adopted to the needs of the communities.

4.1.3 The incorporation of the complementary components relating to management of gardening enterprises, and soil moisture management greatly enhance the likelihood of attainment of positive results, and are necessary to demonstrate the linkages between specific water harvesting applications and local livelihoods improvement in the form of increased food production and income generation.

4.1.4 The recipient has historically demonstrated capacity to implement community based projects with a focus on natural resource management and livelihood improvement and strong elements of gender equity, capacity building and community empowerment. When this is combined with the solid technical inputs of engineering consultants with specialist skills, and reinforced by the sharing of knowledge and oversight value of the Reference Group the project is set to realize its intended benefits.

4.2 Project Viability

4.2.1 The investment in the project is roughly divided between water harvesting infrastructure and capacity development, awareness-raising, complemented with a knowledge generation component. A thorough cost benefit analysis of the whole project including quantification of benefits has not been undertaken. However, a qualitative evaluation shows that benefits consist of increased production for home consumption and sale of surplus production. A detailed economic evaluation would require valuation of such benefits as improved health from better nutrition as well as the social benefits of sense of self, empowerment of women, reduced external dependency, reduced hunger gap in addition to the market valuation of the production and input costs.

4.2.2 As a proxy of viability the level investment per capita and per hectare has been compared with that provided under the Government programme. The project capital costs are overall about 65% of the average of the Government subsidy level.

4.3 Sustainability

4.3.1 The concern for sustainability has been a key issue in the identification of the technical solutions proposed, and gravity-fed irrigation has been prioritised in order to minimise maintenance constraints and operational costs. Experience in the parallel field of smallholder irrigation in South Africa shows both of these factors to be key elements for long term sustainability. Secure access to the land being farmed, and to which the water infrastructure is tied, is a second key sustainability factor and will be addressed through the formalisation of land use agreements where these are not already in place.

4.3.2 Project sustainability is furthermore addressed in the emphasis on building of local capacity and community empowerment, in particular highlighting the active involvement of women and youth. A strong participatory approach throughout project implementation will foster local ownership of the project outputs, enhance community self esteem and minimize dependence. At the same time the knowledge sharing and establishment of networks and partnerships between stakeholders at different levels will enhance the capacity of local institutions. In sum, the intervention will enhance local communities' and institutions' resilience by strengthening their ability to analyze and address issues of water scarcity and climate change.

4.3.3 The identification of each site-specific rainwater harvesting infrastructure system has been carried out with thorough attention to the local environmental context. The national requirements for clearance have furthermore been taken into account. According to the administration of the National Hierarchy of Water Entitlements under DWAF, the diversions in this particular project are minimal and do not require a formal Environmental Impact Assessment. In addition the technical specifications will incorporate any requirements for protection of the environment during construction.

4.3.4 The IWHP initiative can serve to demonstrate new, replicable solutions. Local and regional Government bodies engaging in IWRM have clearly expressed willingness to collaborate in this initiative. Government departments have allocated funds at the local government level to accelerate the realization of the MDGs and the project will build knowledge and relationships needed to source these funds.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary and Overall Assessment

5.1.1 The project addresses the aspirations of the target communities to be able to buffer themselves against vulnerability to periods of insufficient soil moisture for crop requirements. The IWHP focuses on providing lasting, appropriate and affordable solutions to this aspect.

5.1.2 Critical success factors include community skills and knowledge of crop production techniques and water efficiency, institutional strength and secure access to land. These have been incorporated in the project as necessary precedents for the main component to be effective.

5.1.3 The recipient has the necessary capacity for implementing the project and IWHP has the potential to demonstrate how the issues of water and food scarcity can be addressed with effective and innovative solutions tied into IWRM processes at local and regional levels.

5.2 Recommendations

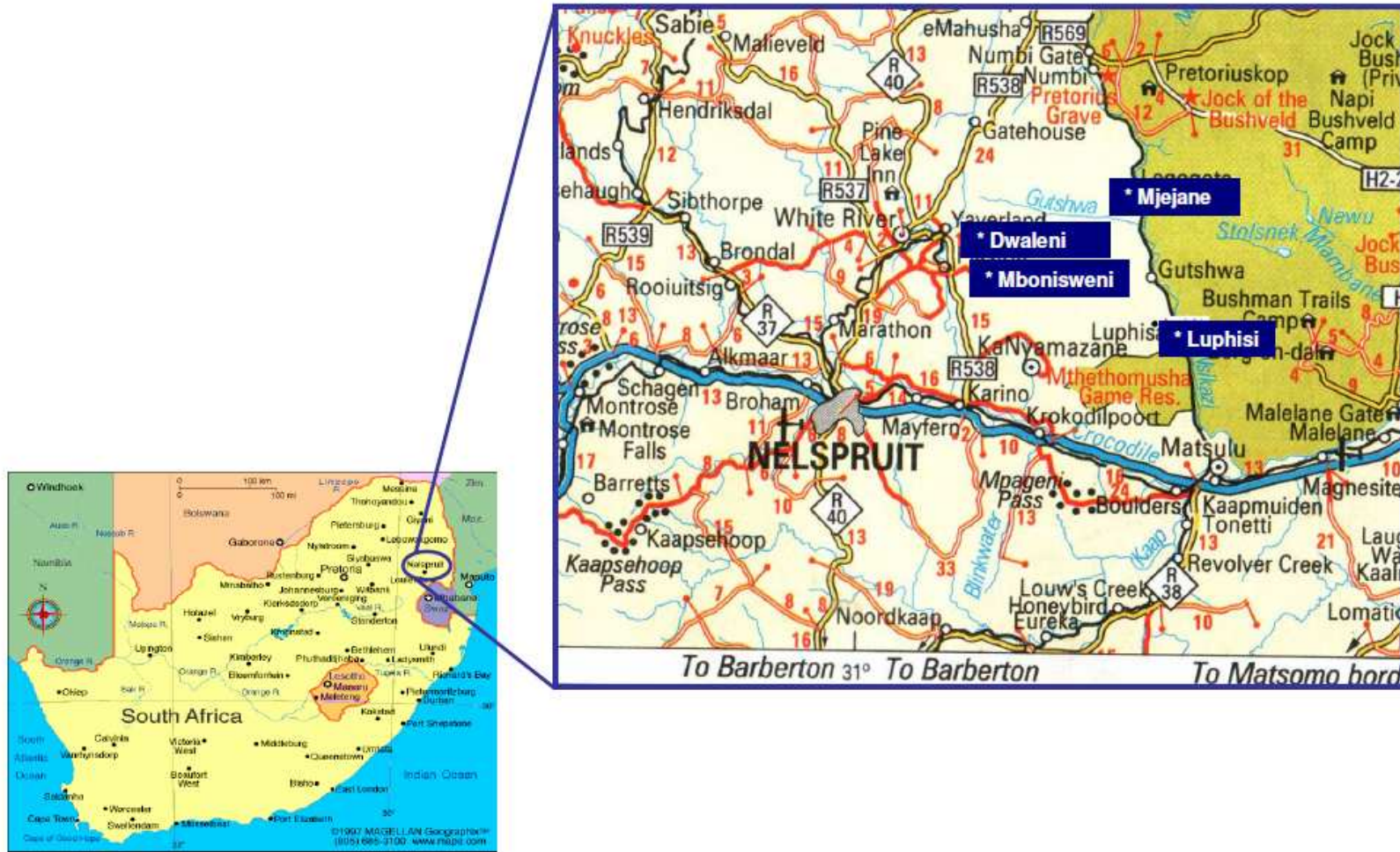
5.2.1 It is recommended that an AWF grant not exceeding EUROS 374,010 be granted to the Recipient Ecolink for the purpose of implementing the proposed project described in the present report, subject to the following specific conditions:

5.2.2 Conditions precedent to Entry into force of the Grant Protocol of Agreement and First Disbursement:

- I. The Grant shall enter into force on its signature. The first disbursement of the Grant shall be conditional upon the fulfilment of the following conditions:
- II. The Recipient shall
 1. Provide evidence of the opening of a Special Account at a bank in South Africa (§ 3.5.1) into which part of the AWF grant resources shall be deposited on the request of the recipient
 2. Provide evidence that it has designated a Project Manager (§ 3.2.1) with qualifications acceptable to the AWF to execute the project as described
 3. Provide evidence of the establishment of the PSC (§ 3.2.5) of the project with a composition and qualification of members, and Terms of Reference acceptable to the AWF.

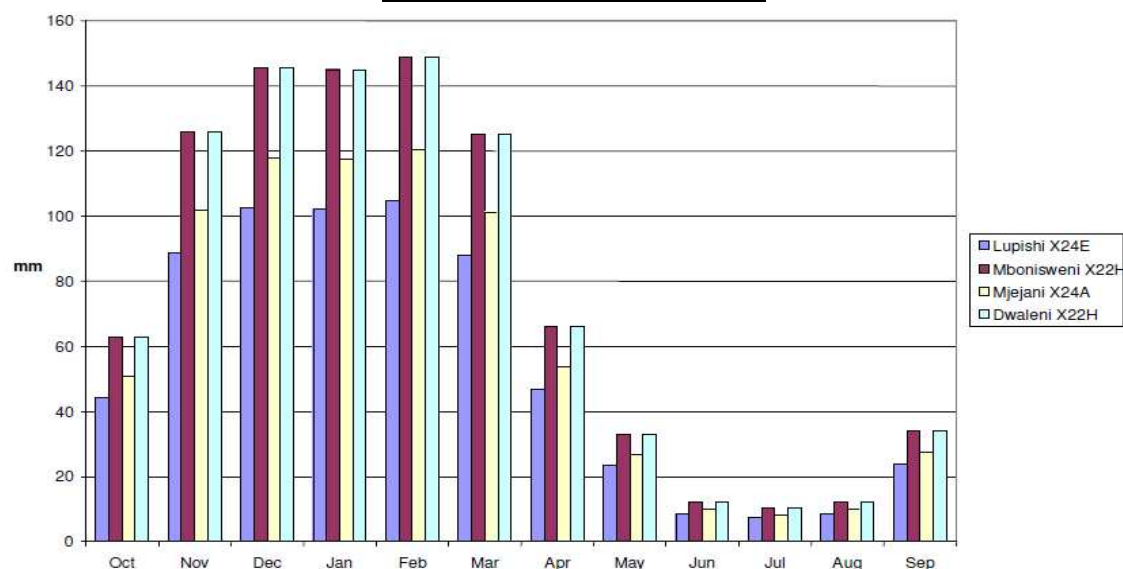


Annex 1: Map of the Project Area



Annex 2: Water Availability in project area

Rainwater availability...



...and Summary Climatic Data for the project area

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg_Tot
Temperature_avg (°C)	24.6	24.8	23.6	21.5	19.2	17.0	16.8	18.4	20.9	21.7	22.8	23.7	21.2
Temperature_max (°C)	30.0	30.2	29.0	27.3	25.8	24.0	23.8	25.3	27.7	27.8	28.5	29.2	27.4
Temperature_min (°C)	19.1	19.4	18.3	15.7	12.6	9.9	9.9	11.5	14.2	15.6	17.1	18.3	15.1
Humidity_avg (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Humidity_min (%)	49.0	47.0	47.0	42.0	34.0	32.0	33.0	32.0	33.0	40.0	44.0	47.0	40.0
Windrun (km/day)	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0	140.0
Sunshine (hrs/day)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Radiation (MJ/m ² /day)	21.3	20.2	18.5	15.7	14.1	16.1	12.7	14.0	16.5	17.3	19.7	21.2	17.2
ET ₀ (mm/day)	4.9	4.8	4.2	3.6	3.1	2.9	2.8	3.3	4.1	4.3	4.7	4.9	4.0
Rain (mm)	117.0	132.0	102.0	54.0	20.0	10.0	8.0	10.0	28.0	50.0	105.0	116.0	746.0
Rain events	11.0	12.0	9.0	6.0	2.0	1.0	1.0	1.0	3.0	6.0	11.0	11.0	79.0

Monthly ET₀ (mm) versus monthly rain (mm)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
ET ₀	133.3	141	151.9	151.9	134.4	130.2	108	111.6	87	86.8	102.3	123
Rain	50.0	105.0	116.0	117.0	132.0	102.0	54.0	20.0	10.0	8.0	10.0	28.0

The above charts and tables indicate that while potential evapo-transpiration is always more than rainfall, the deficit is most significant in the months of May through September inclusive. Crop water requirements can only be met almost exclusively through irrigation.

Annex 3: Project Implementation Schedule

Activity Chart for Integrated Water Harvesting Programme

	MONTHS																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Output 1: Food security: enhance opportunities and resources available to small-scale farmer groups																															
Activity 1.1: Awareness about soil care, drop per crop value, available seed and plant multiplication, organic farming methods, fertiliser and manure maximisation																															
Activity 1.2: Health, nutrition, hygiene training where the relationship between water quality (and quantity), hygiene, health and food is made explicit -agriplanner training																															
Activity 1.3: Training in permaculture production, composting, infield rainwater harvesting and income generation / marketing																															
Output 2: Development of teaching resources: improve teaching and learning resources available t facilitators, learners and target community																															
Activity 2.1 Analysis of gaps in terms of learning resources and develop appropriate new tools where needed for IWRM and RWH																															
Activity 2.2. Design and produce educational posters to be used in community outdoor classroom and in promotion of project																															
Activity 2.3 Develop narrative text and stage puppet street theatre around RWH theme -roll out in District																															
Activity 2.4: Translation of materials into vernacular																															
Output 3: Infrastructure development																															
Activity 3.1: Implement detailed design process of concepts outlined in the Technical Report																															
Activity 3.2: Implement tender and construction process.																															
Activity 3.3: Train community members in system operation and maintenance. Explore options for replication at different scales																															

Annex 4: Beneficiaries and stakeholders

Community group members and their dependants

Place name	Name of Group	Membership	Dependants	Community size
Mjejane	Sivukile Women's Group	24	132	1000
	Vukasambe Youth Group	21	40*	N/A**
Luphisi	Vukani Women's Group	23	173	2000
Mbonisweni	Masibambisane Women's Group	10	44	5000
Dwaleni	Asikhutulisane Chicken Abattoir Project	12	48	3000
	Sizanani Home Based Care Group	10	46	NA**
Total		100	483	11 000

*Some of these youth head households—others are the children of Sivukile Group members

**Same community as above

Institutional beneficiaries and stakeholders

Name of institution	Rationale for interest of stakeholder
Inkomati Catchment Management Agency(ICMA)	Responsible for planning and implementing improved IWRM in the catchment and has identified the IWHP as a pilot. There is a major opportunity to raise awareness through the CMA on the impact that RWH can have for resource poor farmers
DWAF regional office	Case study examples of what works and what does not work to improve RWH in South Africa and the Region.
WRC (or/and other research institutes)	Students and professionals who require empirical evidence will have sites to investigate hypothesis and advance their inquiry. Working papers and journal publications or conference papers will disseminate knowledge and experience and contribute to the body of RWH knowledge on the continent and elsewhere.
AWIRU (or/and other tertiary education centres (ARDRI)	Networks between RWH experts on the Continent and in developing country contexts will be strengthened as information is shared and experience gained
NGO's (including Ecolink)	NGO's play an important development role in many communities, not just through channelling of resources, but also through the high value of long term relationships at village level, something that short-term consultants, or high turnover Government staff cannot achieve
Induna's/chiefs	Strengthening social fabric of community, engaging with women's groups around more secure land access, through formalising agreements for groups' access to communal land, particularly strengthening the local political hand of women who traditionally do not get access to land through the Tribal Authorities.
Other DM's or LM	The central planning tool at District and Local Municipality is the Integrated Development Plan. Raising profile of the communities needs and of practical solutions implemented to address challenges can be of substantial value to others in similar water situations.
Foreign donors	Innovative new approaches (technical and process) in any foreign location informs strategic action in another, or more locally. Development of replicable 'models'
Students (post graduate students)	Implementing field work component of thesis (see above)

Annex 5A: Project Cost Breakdown by Component and Category of Expenses in ZAR '000

Estimated Cost per output for the Integrated Water Harvesting Project: Ehlanzeni District (4 villages)	Comm	Works	Goods	Services	Misc.	Total
Output 1: Food security						
Soil testing and conservation methods (soil care) @ R5 000 per village x 4				21.44		21.44
Agriplanner and food production training @ R40 000 per village x 4				171.53		171.53
Composting, fertilizer, seedlings, trees and gardening materials @ R25 000 x 4 villages			107.21			107.21
Product placement, transport, packaging @ R30 000 per village x 4			128.65			128.65
Nutrition, health and hygiene training @ R15 000 per village x 4				64.32		64.32
Subtotal			235.85	257.29		493.15
Output 2: Development of learning resources						
Analysis of gaps – workshops and networking with region, continent and developing countries e.g. Korea				53.60		53.60
Design and produce posters, maps and training manuals				128.65		128.65
Puppet theatre (includes production, training of actors, costumes)				75.04		75.04
Translation into vernacular				42.88		42.88
Subtotal				300.18	-	300.18
Output 3: Infrastructure						
Construction of Infrastructure (escalated 7.5% for 2009)	71.41	1,356.75				1,428.16
Engineering Design Fees (17 %)				278.49		278.49
Technical training				205.84		205.84
Transport for technical team				64.32		64.32
Accommodation					19.30	19.30
Other disbursements					12.86	12.86
Subtotal	71.41	1,356.75		548.65	32.16	2,008.97
Output 4: Outreach and Institutional Capacity Building						
Scoping and identification of partners and signing of MOUs (travel, phone, meetings)				53.60		53.60
Monthly meeting with local stakeholders (travel + refreshments) @ R 5000 per meeting for 24 meetings					128.65	128.65
Reference Group Meetings (travel, refreshments, accommodation, stipend for RG) @ R15 000 per meeting x 4 meetings					64.32	64.32
Training of VWC in organizational capacity (e.g.) admin, financial controls, conflict resolution @ R20 000 per village x 4				85.76		85.76
Subtotal				139.37	192.97	332.34
Output 5: Project Management and Reporting						
Report writing @ R40 000 per report x 6 reports				257.29		257.29
Project management and controls @ R15 000 per month X 24 months				385.94		385.94
Transport costs: Vehicle acquisition			253.40			253.40
Project Management Overheads apportioned					367.07	367.07
Subtotal			253.40	643.24	367.07	1,263.71
Output 6: Evaluation and Monitoring						
Develop M and E indicators				32.16		32.16
Baseline and follow up surveys (data collection includes anthropometric module, design, implementation and verification)				235.85		235.85
Analysis of surveys, M + E indicators and qualitative data @ R50 000 per survey				107.21		107.21
Dessimination and Publication Workshop					278.74	278.74
				375.22	278.74	653.96
	71.41	1,356.75	489.25	2,263.94	870.94	5,052.29

Annex 5B: Project Cost Breakdown by Component and Category of Expenses in EUR '000

Estimated Cost per output for the Integrated Water Harvesting Project: Ehlanzeni District (4 villages)	Comm	Works	Goods	Services	Misc.	Total
Output 1: Food security						
Soil testing and conservation methods (soil care) @ R5 000 per village x 4				1.64		1.64
Agriplanner and food production training @ R40 000 per village x 4				13.12		13.12
Composting, fertilizer, seedlings, trees and gardening materials @ R25 000 x 4 villages			8.20			8.20
Product placement, transport, packaging @ R30 000 per village x 4			9.84			9.84
Nutrition, health and hygiene training @ R15 000 per village x 4				4.92		4.92
Subtotal	-	-	18.04	19.68	-	37.72
Output 2: Development of learning resources						
Analysis of gaps – workshops and networking with region, continent and developing countries e.g. Korea				4.10		4.10
Design and produce posters, maps and training manuals				9.84		9.84
Puppet theatre (includes production, training of actors, costumes)				5.74		5.74
Translation into vernacular				3.28		3.28
Subtotal	-	-	-	22.96	-	22.96
Output 3: Infrastructure						
Construction of Infrastructure (escalated 7.5% for 2009)	5.46	103.79				109.25
Engineering Design Fees (19.5 %)				21.30		21.30
Technical training				15.75		15.75
Transport for technical team				4.92		4.92
Accommodation					1.48	1.48
Other disbursements					0.98	0.98
Subtotal	5.46	103.79	-	41.97	2.46	153.68
Output 4: Outreach and Institutional Capacity Building						
Scoping and identification of partners and signing of MOUs (travel, phone, meetings)				4.10		4.10
Monthly meeting with local stakeholders (travel + refreshments) @ R 5000 per meeting for 24 meetings					9.84	9.84
Reference Group Meetings (travel, refreshments, accommodation, stipend for RG) @ R15 000 per meeting x 4 meetings					4.92	4.92
Training of VWC in organizational capacity (e.g.) admin, financial controls, conflict resolution @ R20 000 per village x 4				6.56		6.56
Subtotal	-	-	-	10.66	14.76	25.42
Output 5: Project Management and Reporting						
Report writing @ R40 000 per report x 6 reports				19.68		19.68
Project management and controls @ R15 000 per month X 24 months				29.52		29.52
Transport costs			19.38			19.38
Project Management Overheads apportioned					28.08	28.08
Subtotal	-	-	19.38	49.21	28.08	96.67
Output 6: Evaluation and Monitoring						
Develop M and E indicators				2.46		2.46
Baseline and follow up surveys (data collection includes anthropometric module, design, implementation and verification)				18.04		18.04
Analysis of surveys, M + E indicators and qualitative data,				8.20		8.20
Dissemination and Publication Workshop					21.32	21.32
	-	-	-	28.70	21.32	50.03
	5.46	103.79	37.43	173.19	66.63	386.49

