

**UNITED NATIONS ENVIRONMENT PROGRAMME  
NAIROBI CONVENTION**

**WIOSAP FULL PROPOSALS TEMPLATE**

**Call title:** Implementation of the Strategic Action Programme for the protection of the Western Indian Ocean from land-based sources and activities (WIO-SAP)

**Participating countries:** Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, South Africa, Tanzania [and France (not project beneficiary)]

**Executing organization:** Nairobi Convention Secretariat

**Duration of demo projects:** 2 years

**Stage of the call:** Full proposals

**Submission dateline:** 5<sup>th</sup> May 2019

**INSTRUCTIONS**

<b>Organisation Name</b>	Waste Management and Standards, Waste Enforcement and Permits Division, Environment Department, Ministry of Environment, Energy and Climate Change
<b>Project Title</b>	Improving Water Quality by use of Constructed Wetland Wastewater Treatment at a Farm in the South of Mahé Island
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<b>Registration Details</b>	Type of organisation: Government Ministry Country: Republic of Seychelles Registration Number: Year: 2019

### Executive Summary:

The project seeks to implement a small-scale demonstration project in the South part of the main island, Mahé, that can eventually be replicated by the farming community especially the small-scale farmers. The benefits will be better awareness on environment protection and sustainable farming practices. The limitations in production of pork due to the sensitivity of the environment may have helped discourage farmers in venturing and optimizing this kind of farming. There are also limited data on the re-use of treated effluent for improving crop yield despite the fact that this has been emphasized in the Sanitation Master Plan for the Seychelles. The project intends to create a working group that can further emphasize on the practicality of creating small scale wetland systems that can effectively treat wastes from piggeries and reuse the treated effluent and reduce the dependence on chemical fertilizers leading to savings. Sampling of ground and surface waters will determine the changes in pollution level that potentially can be washed downstream and enter the downstream ecosystems such as the wetlands and the marine reef systems.

## I. BACKGROUND AND JUSTIFICATION

Seychelles is a small, service-based with a middle-income, and is an archipelago of 115 islands scattered over 1.3 million square kilometres of sea, in the middle of the Western Indian Ocean, north of Madagascar. The group of islands comprises of 41 granitic islands and 74 coralline islands. The total land area is approximately 455 square kilometres. With a gross national income per capita of US\$13,990 by 2014 according to the World Bank (WB), it has an estimated population of around 91,000 inhabitants and an exclusive economic zone (EEZ) of almost 1.4 million km<sup>2</sup> in one of the world's major tuna fishing grounds. Growth was 2.8% GDP in 2014 compared to 3.5 % in 2013.

Compared to other countries in the African region, the engine for economic development in Seychelles is the tourism sector which accounts for 70% of the foreign exchange earnings and 25% of GDP followed by fisheries, accounting for 5% of GDP, 7% of employment and 35% of total exports. The government has introduced various activities and incentives to attract local and foreign investors to develop other industries in the Seychelles, among one of them is the policy framework and mechanisms for the agricultural sector.

One of the challenges being faced by the agricultural sector is with regards to the limit to which the animal wastes can be treated and the effluent can be recycled onto farming areas instead of into the natural environment. There are severe limitations to where animal rearing can be undertaken and also on the size of the piggery given the proximity of either sensitive environment or residential areas. The Public Health Agency (PHA) has recurrent issues with the waste abatement capability of existing disposal systems and the way that the piggeries are managed in general. Furthermore, the suspended solids that accumulate on the farms are neither treated conveniently nor considered to a considerable level as a resource. Should the principle of IWRM be considered and implemented, the reuse of the treated effluent, as proposed in this project, will reduce the use of chemical fertilizers on the farm and eventually in the country in general. The overall treatment and recycling of the effluent should contribute to the improvement of the country's aesthetics and ecosystem health and thus will also assist the country in achieving the goals set out in The Seychelles Eco-Tourism Strategy for the 21st century (SETS 21). The strategy seeks to position Seychelles as an eco-tourism destination, promoting a sustainable tourism industry and enhancing the economic benefits of tourism for local communities.

Seychelles signed the Comprehensive Africa Agriculture Development Programme (CAADP) Compact (SCC) on September 16, 2011 thus reaffirming the government's commitment to create a policy framework to support and promote desired policy and technical decisions to transform Seychelles' agricultural sector and enhance its performance. Following the signature, The Government of Seychelles (GoS) launched the development of the Seychelles National Agricultural Investment Plan (SNAIP) framework that seeks to harmonize, consolidate and accelerate the implementation of the country's agriculture and food security and nutrition related policies and strategies in the period 2015 to 2020. SNAIP sets the country's agriculture and food security and nutrition development for five years within the context of the Medium-Term Expenditure Framework (MTEF).

Based on the above, consultations were undertaken with the PHA and reference were made to studies on Agriculture, whereby it became apparent that the country is experiencing a drastic drop in local production of poultry at the same time that the local demand in 2017 for pork was 1,569 tonnes yet only 429 tonnes were produced locally. Prior to 2008, the country was producing over 50% of both pork and poultry.

Other than market access and access to affordable credit to investment in expansion and new and/or improved on farm and value chain facilities, one of the hurdles that is often overlooked, is the lack of treatment facilities for the slurry and waste matter that is produced in livestock production. The farms either lack the necessary facilities to treat their wastewaters and slurry or they do not have the financial means to undertake the capital investment. In order to expand livestock production, it is necessary to contain and treat the faecal waste matter and recycle the effluents in a sustainable and environmentally friendly manner. There is presently a lack of regulations for the application, management and monitoring of waste water and manure in farming areas. It can be mentioned at this stage that:

- The Public Health Act regulates water pollution, solid and liquid waste disposal and animal keeping and therefore PHA can object to any proposed farming activity that have the potential of affecting the immediate surroundings and the downstream water quality.
- The Public Health Act (Water Examination) Regulations, 1994 does not make any mention of raw water from catchment; ground water, river or coastal water. It only focuses on treated water and swimming pool water quality.
- The Effluent Standards in EPA does not cover a broad spectrum of biochemical parameters for effective wastewater monitoring moreover there are some discrepancies on which Government Agency that should be undertaking the wastewater monitoring for effluent discharged and samples are collected mainly following complaints related to complaints of effluent discharge.

The project seeks to implement a small-scale demonstration project that can eventually be replicated by the farming community especially the small-scale farmers. The benefits will be better awareness on environment protection and sustainable farming practices.

The proposed action is in line with the Seychelles Water Policy (2017), namely Policy Statement B 1.4, which suggests that the responsible authorities shall continue to adopt necessary measures to prevent and control pollution (point and non-point sources) of ground and surface waters resulting from inland, coastal or offshore activities.

The same policy document also states (Policy Statement B 1.5) that the responsible authorities shall follow a source-to-sea approach to the management of water resources and take necessary steps to prevent negative impacts on the coastal and marine environment.

The project relates to a relevant component in the Agricultural Sector Development Study (ASDS, 2015), namely:

Sub-component 2.2: Improved livestock production and commercialization. The outcome target of the livestock production and commercialization sub-component will be to increase the consumption of livestock consumed locally from 11% to 25% by 2021

Sub-component 2.2.3: Access to smart subsidies compliant with the WTO agreement. 2.2.3 (B): Budget support for smart subsidies in order to achieve these objectives the following six key investment activities will be undertaken:

- (iii). Provide subsidies for sewage of biggest pig intensive and ruminants farms, slaughterhouses and processing sites;
- (iv). Provide subsidies for biogas system for biggest intensive and ruminants farms;
- (vi). Provide subsidies for reshaping of small slaughterhouses and processing sites to respect compliance with sanitary and hygienic requirements.

The report is indirectly suggesting that financial and technical support is necessary in order to improve livestock production given the substantial capital and operation costs of a treatment system.

The projects and programmes that will complement the proposal are:

The project complements the Integrated and Comprehensive Sanitation Master Plan for Seychelles, August 2017 report. The ICSMPS is based on an Integrated Urban Water Management (IUWM) approach, which identifies and utilises links and synergies with other infrastructure sectors – water supply, drainage, solid waste and energy, and other concerned areas like agriculture, land use planning, tourism and economic development. Anaerobic Digestion and Biogas Energy Recovery Engine were proposed in the report, which can be adapted to the livestock sector during the implementation of this proposed project. The treated effluent can either be recycled onto farm land or safely discharge in the public sewerage system if it meets the discharge requirements if there is any surplus.

## II. PARTNERSHIPS

Partner Name Mandate	Role in the project	Resources partner will provide
Ministry of Environmental, Energy, and Climate Change (MEECC), Ministry of Agriculture and Fisheries	Leading Government Agencies	Policy matters.
Seychelles Agricultural Agency (SAA)	Overall coordination and project supervision	Engineers, researchers
Ian Charlette Consulting	Design & supervision	Technical expertise
Public Health Authority (PHA)	Special advisory services on sanitation	Human resources (Environmental Health Engineers)
Public Health Laboratory (PHL)	Supporting services, Laboratory and issues on sanitation and hygiene	Environmental health officers, laboratory technicians,
Seychelles Bureau of Standards (SBS)	Laboratory services	Laboratory Technicians and equipment
District Administration (DA) in association with the Regional District Council	Supervision and communication; Assistance with creation of watershed committee and contact with the community	Offices and project supervision
University of Seychelles (UniSey)	Research, data collection.	Students, laboratory services, documentation

## III. OBJECTIVES

### A. Overall objective

To undertake a demonstration project for treatment of waste water from a small-scale piggery, and to mitigate the impacts by applying best practices.

The project would seek to find optimum ways of effectively managing waste water from a piggery by treating it to an appropriate level and recycling the treated effluent on agricultural land and using the solid matter for making compost. The abatement of the pollution and waste matter from the piggery will make it more

acceptable for rearing pigs in small farming communities where there is insufficient buffer distance between agricultural land and residential and commercial areas, eventually boost the production of pork in the country and reduce importation. The project also seeks to implement the IWRM Principle which promotes the re-use of treated effluent and considering it as a resource.

## **B. Immediate/specific objectives**

### **Project Objectives**

The objective of this demonstration project is to assist a small-scale farmer with technical and financial assistance associated with the setting up of a treatment system in order to allow sewage from the piggery to be effectively treated and ensure compliance with the requirements of the Public Health Authority (PHA). The project activities are presented in the Section on Project Implementation and Management Plan.

## **IV. PROJECT IMPLEMENTATION AND MANAGEMENT PLAN (See definitions in Annex 3)**

Objective 1: Improvement of Waste Water Discharge from Piggery

Activities

### 1.1 Selection of Project Site and Design of Wastewater and Irrigation System

- 1.1.1 Engage with main government stakeholders (namely health, agriculture, district administration, environment) and farming association
- 1.1.2 Identification of potential candidate site for the demonstration
- 1.1.3 Evaluate sites and confirm demonstration project site
- 1.1.4 Topographical survey
- 1.1.5 Conceptual design of conveyance, treatment and irrigation system
- 1.1.6 Preparation of BoQ and Scope of work for Contractor
- 1.1.7 Preparation of Tender Documents and Bidding Exercise
- 1.1.8 Award of Bids

### 1.2 Construction Stage

- 1.2.1 Mobilization on site by Contractor
- 1.2.2 Setting out of site
- 1.2.3 Supervision of Construction Works
- 1.2.4 Construction and Installation works
- 1.2.5 Dry and wet commissioning

Objective 2: Improved Networking and Selection of Working Group

Note: Could be undertaken during the tendering Stage when Construction is imminent or shortly after site mobilisation.

Activities

## 2.1 Selection of Focal Point persons and Action Plan

- 2.1.1 Engagement with Heads of Department by Environment Department
- 2.1.2 Selection of Focal Point Persons
- 2.1.3 Assignment of Responsibilities
- 2.1.4 Agreement on sampling protocol (frequency, samplers, etc.)
- 2.1.5 Site visit and selection and confirmation of sampling points and parameters
- 2.1.6 Sampling, Project Supervision and reporting
- 2.1.7 Review and validation of data

Objective 3: Improvement of crop production and food security

Note: Treated effluent from the wetland system is to be used in an irrigation system to selected crops

Activities

### 3.1 Improvement of crop production

- 3.1.1 Identification of crops to be subjected to irrigation system
- 3.1.2 Install irrigation system
- 3.1.3 Recording and data collection
- 3.1.4 Monitoring of crop production
- 3.1.5 Report writing

## A. Expected project results and indicators

The indicators (Annex 3) include the following:

Indicator 1.1: Identify test parameters that are in compliance

Indicator 1.2: Determine the improvement in water quality following stabilisation of waste water treatment system

Indicator 2.1

Indicator 3.1: Improved yield in selected crops

Indicator 3.2 Reduction in use of chemical fertilizers

## B. Project activities and work plan

The project will include the following tasks:

1. Identification of project area (1 Nos. from shortlisted sites identified by SAA)
2. Planning stage-Topographical survey and design of sewerage system. Location and approval of infrastructures (sewers, treatment system, lifting/pump stations, irrigation systems, etc.

3. Preparation and implementation of a monitoring plan for hydrology and water quality
4. Stakeholder workshop
5. Tendering process
6. Construction period
7. Organisation of workshop with laboratories and research facilities
8. Finalisation of sampling points, sampling methodology and storage.
9. Sampling and Laboratory Analysis
10. Review of Data and sampling procedures
11. Monitoring of crop production
12. Report Writing/Project Updates
13. Decommissioning stage (In the event that project fails to meet its objectives)

### **C. Project Beneficiaries**

A multi-stakeholder engagement and participatory framework will be implemented in order to reach Objective 2 (Improved Networking and Selection of Working Group). The farming community will be kept abreast of the demonstration project by the SAA representative and thus ensure that they benefit from the project. The project, in itself, will have a transparent process and will involve the community as custodians of the project rather than being government led. All data will be shared by the users and the water managers.

### **D. Implementing agency management of project**

In consideration of Objective 2 (Improved Networking and Selection of Working Group) the project will foster ongoing collaboration between the government agencies, the farming community and ensure capacity building within the country. The project could also be used as a starting point for the Apex body that has been proposed under the Water Policy in the area of governance of water resources. The planned collaboration of the project team will be used to iron out any management and capacity issues that can be taken up for consideration under another project or during the operationalisation of certain components of the Water Policy. Further information on the implementation of the project is provided in the Project Methodology (Part V).

## **V. PROJECT METHODOLOGY**

### **Elaboration on Objectives**

The proposed project seeks to address the issue of pollution mentioned in the Seychelles Water Policy (2017), which recognises that the country's water resources are at risk from pollution and other environmentally harmful activities by discharges from domestic, industrial and agricultural activities.

The demonstration project will identify a farming community on the island of Mahé either on the South East Coast, presumably in the Baie Lazare district at Val D'Endor, or on the South West coast in the Anse Boileau district where there are substantial farming activities and private entrepreneurs in the farming industry who may wish to support the treatment system being developed. The cost-effective treatment system can be installed and operated with local expertise. Waste water from existing livestock areas and a few households in a watershed area will be sent through a small sewerage system and to an anaerobic waste water treatment system. The sludge will be dried and allowed to mature under weather proof shelters and the leachate will be directed to the sewerage system. An irrigation system will be installed to recycle part of the treated effluents as well as to an irrigation system. The rest of the effluent will be further polished by the use of an artificially constructed wetland system.

A small-scale piggery with less than 50 pigs, will be selected and which already has a reasonably well-built sty, requiring minor refurbishment, which is well covered and there is minimal entry of storm or rain water inside the piggery. This is necessary given the fact that the volume of water entering the sewerage system will be a determining factor in the selection for a piggery that will form part of the project and the size of the wetland system. The piggery should preferably have an existing holding tank in order to allow the funds to be used on the works associated with the wetland system.

The intention is to convey the liquid supernatant from the holding tank to an artificial wetland system, where it will be subjected to biological treatment. Black water from a nearby farmhouse, site office or residence will also be mixed with the waste water from the piggery.

Solid waste matter will be subjected to composting for eventual re-use in the farming community or by residences. The process will be supervised closely by the Public Health Authority (PHA) to ensure compliance and also by the District Administration and the Seychelles Agricultural Agency (SAA) to ensure that the community is not affected by the project. It is expected that the necessary consultations, permitting and construction will be completed within a two to three-month period. The size of the project will obviously depend on the volume of the waste water being generated, the ground conditions and the topography and the presence of sensitive receptors such as streams. It is expected that the site will be accessible in order to facilitate the construction phase and the project monitoring stage.

In general, the following structures are expected to be undertaken:

- Construction of a holding tank, if the site lacks one;

- Re-roofing of the piggery and proper channelling of ground water if these are absent or deficient;
- Installation of pipes or conveyance system;
- Construction of an artificial wetland system with small stones and aggregates;
- Construction of composting beds and covers;
- Installation of a single-phase submersible pump for recycling of the effluent to the crops.

Data such as water usage, amount of feed, number and size of pigs, etc, will be kept for further analysis by the researchers. To ensure participation and transparency, different stakeholders will be assigned different tasks and responsibilities. One or two boreholes will be placed downstream to monitor effects of the system on ground water.

In consideration and fulfilment of Objective No. 3, SAA can undertake research to compare the yield of crops that receive the treated effluent with those that receive other means of irrigation using established techniques demonstrated at the Research Centre at Anse Boileau.

The upstream and downstream water quality can be tested by local laboratories for signs of water pollution over the project period and beyond if funds from other projects are secured. All samples should be collected by trained personnel and the storage and analysis undertaken as per the required standards. The parameters to be measured include volume of water, salinity, phosphate, nitrogen, total solids. It is expected that there shall be routine recording of water meters and monitoring at the weirs and bimonthly water sampling at the rivers and each of the boreholes

The overall intention of the project is to identify the costs involved with operating a small scale and demonstrate the effectiveness of low cost treatment systems and practices mitigating land-based pollution. The data that will be collected will be shared with the farming community for eventual replication. The data collected on crop production (including cost savings on the use of fertilizers) is to be analysed and a cost benefit evaluation is to be produced by competent persons in the project team.

## VI. SUSTAINABILITY AND REPLICABILITY

The project will link up with the upcoming Ridge to Reef (R2R) GEF 6 project that will be implemented as of May 2019 for a period of 6 years and will provide much required additional training and equipment that will be useful in the long-term success of the project. The farming community has proven to be a very active group as demonstrated during the Agricultural Sector Development Study (ASDS) and it is expected that they will contribute and participate in this demonstration project, which is geared towards improving production of pork and crop yield.

## VII. PROJECT MONITORING AND EVALUATION

The project supervision is to be undertaken by the project team. Timely and scheduled visits are to be organised and a sampling protocol needs to be followed. A Team Leader may be selected but overall supervision should be by the Environment Department. The monitoring will include:

**Site monitoring visits:** These should be attended by at least two persons from the Project Team and a de-briefing done by the end of the visit. The use of information technology such as by WhatsApp. A monitoring log book for recording of site observations and complaints are to be kept and shared with the Project Team. Water and effluent samples can be collected and brought to the designated laboratories.

**Quarterly Project reporting:** A joint meeting is to be organised by all project participants for sharing of data and validation of information. Suggestions to improve the project outcomes should be discussed at such meetings, which can either take place on site and/or in the District Administration to allow maximum participation of all stakeholders in the community. The project budget is also to be discussed to prevent overspending.

**Annual Narrative Report and End of Project Evaluation:** These reports will include site observations and evaluate the performance of the project. Recommendations will be made as to how the project can be improved and eventually replicated.

## VIII. BUDGET

The proposed budget has been proposed under Section IV B. It amounts to a total of \$296,460.

### Annex1: Two Year Work Plan

Task	Responsible Party	Year 1												Year 2			
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	Q1	Q2	Q3	Q4
1	SAA, PHA, MEECC																
2	SAA, PHA, MEECC																
3	PUC, PHA																
4	All																
5	MEECC, SAA																
6	SAA, PHA																
7	All																
8	MEECC, PHA, SBS, PUC																
9	PHA, UniSey, PUC, SBS																
10	All																
11	SAA, UniSey																
12	MEECC, Consultant																
13	SAA																

1. Identification of project areas (1 Nos.)
2. Planning stage-Topographical survey and design of sewerage system. Location and approval of infrastructures (sewers, treatment system, lifting/pump stations, irrigation systems, etc.
3. Preparation and implementation of a monitoring plan for hydrology and water quality
4. Stakeholder workshop
5. Tendering process
6. Construction period
7. Organisation of workshop with laboratories and research facilities
8. Finalisation of sampling points, sampling methodology and storage.
9. Sampling and Laboratory Analysis
10. Review of Data and sampling procedures
11. Monitoring of crop production
12. Report Writing/Project Updates
13. Decommissioning stage (In the event that project fails to meet its objectives)

## Annex 2: Logical Framework

<b>Project title: Improving water quality by use of Constructed Wetland Wastewater Treatment at Farm in South Mahé Island</b>			
<b>Project overall objective: To improve the water quality downstream of a piggery and to improve crop production</b>			
<b>Project Results</b>	<b>Outputs</b>	<b>Activities</b>	<b>Costs /output (US\$)</b>
<b>Outcome 1: Quality of coastal receiving waters improved through pilot interventions</b>	O.1.1 Cost-effective technologies for wastewater treatment demonstrated in a farming community.	A.1.1.1 Selection of Project Site and Design of Wastewater and Irrigation System	
		A.1.1.1 Topographical survey	4,000
		A.1.1.2 Construction Stage	224,000
		A.1.1.3 Operation Phase and Maintenance Costs	22,400
		A.1.1.4 Laboratory Analysis	10,560
		A.1.1.5 Consultancy Fees (@US\$1,500/per month for 24 months)	34,000
		<b>Sub-Total (US\$)</b>	<b>294,960</b>
Outcome 2.0: Establishment of Working Group	O.2.1 Improved Networking and Selection of Working Group	A 2.2.1 Selection of Focal Point persons	
		A 2.2.2 Formulation of Action Plan	
		A 2.2.3 Listing of potential community participants	
		A 2.2.4. Agreement on sampling protocol	
		A 2.2.5 Workshops and Meetings	<b>500</b>
		<b>A 2.2.6 Appointment of Community participants and amendment and endorsement of Action Plan</b>	
		<b>Sub-Total</b>	<b>500</b>
<b>Outcome 3.0 Improved Crop Production and Food Security</b>	O.3.1 Improvements to Crop Production	A 3.1.1 Selection of crops to be irrigated	
		A 3.1.2 Installation of Irrigation System	<b>4,000</b>
		A.3.1.3 Monitor crops	
		<b>Sub-Total (US\$)</b>	<b>4,000</b>
		<b>Total (US\$)</b>	<b>299,460</b>



### Annex 3: Project Monitoring Plan

<b>Project Title:</b> Improving water quality by use of Constructed Wetland Wastewater Treatment at Farm in South Mahé Island			
<b>Project overall objective:</b> To improve the water quality downstream of a piggery and to improve crop production			
<b>Project Results</b>	<b>Indicator</b>	<b>Target/baseline</b>	<b>Method (Means of verification)</b>
<b>Outcome 1.0</b> Improved downstream water quality	Indicator 1.1 Identify test parameters that are in compliance	Baseline: 0  Target: To be set during project planning at project site and compare to control site.	Implement Sampling Protocol  Analyse water and waste water samples
	Indicator 1.2 Determine the improvement in water quality following stabilisation of waste water treatment system	Baseline: 100%  Target: +50% improvement (reduction in selected parameters) in water and waste water quality	Review of laboratory results
<b>Outcome 2.0: Establishment of Working Group</b>	Indicator 2.1 Improved community and stakeholder participation	Baseline: 0  Target: Achieve a mix of government officials, professionals and members of the community	In order to allow participation and capacity building, consideration to be made in using existing Task Force personnel operating under District Administration and/or Committee established under Regional Councils
<b>Outcome 3.0</b> Improved crop production and fertilizer consumption	Indicator 3.1: Improved yield in selected crops	Baseline: 100%  Target: 25% increase in crop yield	Review yield figures and compare to historical data

	Indicator 3.2 Reduction in use of chemical fertilizers	Baseline: 100% Target: 50% reduction in fertilizer use	Review consumption of fertilizers and compare to historical or calculated amounts
<b>Outcome 3.0</b>  <b>Objective 2: Improved Networking and Selection of Working Group</b>			

### Definitions

- **Indicator:** Specific information that provides evidence about the achievement of planned results and activities e.g. percentage of, number of, proportion of, ratio of etc. They can either be quantitative or qualitative.
- **Outcome:** Outcomes are the benefits or other long-term changes that are sought from undertaking the project. They are achieved from the utilisation of the project's outputs. Outcomes are linked with objectives, in that if the outcomes are achieved then the project's objective(s) have been met e.g. reduced pollution, improved management of an ecosystem, enhanced stakeholder engagement etc.
- **Objective:** A project objective is a statement of the overarching rationale for why the project is being conducted. It focuses on what the project is going to achieve, rather than what is produced.
- **Output:** Outputs are those results which are achieved immediately after implementing an activity e.g. meeting reports, management plans, knowledge gained etc.
- **Activities:** Activities are tasks that need to be done to produce the outputs for the project e.g. meetings, trainings, taking transects, etc.
- **Targets:** Targets are the desired level of performance you want to see, as measured by indicators, that represents success at achieving your outcome e.g. number of ha to be restored, population of species to be achieved, pollution levels to be achieved etc.
- **Baseline:** A minimum or starting point used for comparisons determined at the beginning of the project.

#### Annex 4: Budget

	Category	Quantity	Unit (US\$)	Cost	Total Cost (US\$)	WIOSAP Support	Co-financing	Remarks
<b>1</b>	<b>Personnel</b>							
	Technical Adviser (man days)	200	170	34,000	34,000			For design, supervision, technical assistance
	Supervision	240	25	6,000			6,000	Government officials, 5 Nos. Bimonthly visits, 24 months
	Agronomists	96	30	2,880			2,880	SAA officials, 2 Nos. Bimonthly visits, 24 months
<b>2</b>	<b>Equipment</b>							
	Sludge pump (1 No.)	1	2,000	2,000	2,000			For transfer of solids to drying beds
	Booster pump (1 No.)	1	1,000	1,000	1,000			For irrigation system
	Irrigation system	1	10,000	10,000	10,000			Pipes, drip feed system, spares
<b>3</b>	<b>Operating costs</b>							
	Electricity costs	24	100	2,400	2,400			US\$100 per month
	Laboratory tests	48	220	15,560	10,560		5,000	Max 7 parameters (SBS, PHL), bimonthly for 24 months
	Maintenance of wetland system	1	15,000	15,000	15,000			Lump sum for clearing of vegetation, washing of gravel
	Maintenance of Irrigation system	1	4,000		4,000			Contract, paid on bi-yearly period
	Chlorine powder	1	1,000	1,000	1,000			For disinfecting effluent
<b>4</b>	<b>Contract Services</b>							
	Topographical survey	1	4,000	4,000	4,000			
	Construction of Wetland (m3)	60	3,200	192,000	192,000			Involves excavation, carting away of soil, foundation works, transport of aggregates and small stones. Dimensions are 6mX5mX2m
	Retaining wall (SQM)	25	300	7,500	7,500			Site is expected to be sloped.
	Holding Tank, ferrocement (m <sup>3</sup> )	3	2,500	7,500	7,500			Optional, For supernatant
	Holding Tank, Fibreglass	1	1,000	1,000	1,000			For holding effluent and for irrigation
	Drying beds (SQM)	5	800	4,000	4,000			Block work, double plastic lining, covered

	<b>Installation of irrigation system</b>	1	3,000	3,000	3,000		Lump sum, Installing 100m length
	<b>Works shop (Nos)</b>	2	1,000	2,500	500	2,000	
<b>5</b>	<b>Travel</b>						
	<b>Mileage (US\$)</b>	28,800	1	28,800		28,800	5 vehicles, weekly visit, 24 months, 1\$/km rate
	<b>Total (US\$)</b>			<b>340,140</b>	<b>299,460</b>	<b>44,680</b>	

### Definitions

- **Personnel:** This will be critical personnel required for the successful implementation of the project e.g. a Project Coordinator. Such a role can also be cost-shared with another ongoing project, which has complementary interventions to the proposed WIOSAP project. This category will also include required consultants who may be required for critical technical expertise in the project.
- **Equipment:** This will include a computer, printer, any required office furniture, critical water quality measuring instruments of a reasonable and cost-effective budget etc.
- **Operating costs:** Will include internet, mailing and where very necessary, telephone charges. Will include stationary, fuel and other necessary inputs without a recurring value.
- **Contract services:** Where external services will be required to bring in critical expertise e.g. contractors for construction works etc. This category also includes meetings/workshops e.g. contracted conference package.
- **Travel:** To include ticket costs, local transport and daily subsistence allowance.